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# The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

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Editor for New Brunswick.

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*THE EDUCATIONAL REVIEW.*

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WITH this number begins the EIGHTH VOLUME of the REVIEW. Since the last issue we have received many warm expressions of congratulation from different parts of the Atlantic Provinces on the thriving condition of this, the teachers' journal. The REVIEW thanks most heartily its host of well-wishers, and it assures them that their kind words of encouragement adds to the desire to make the REVIEW more worthy than ever of their good opinion.

THE next number of the REVIEW, to be issued about the 12th July, will contain a full report of the N. B. Teachers' Institute. Every subscriber should notify us in time of any change of address, so that this number may not be lost. The historical value of the REVIEW, as a depository of the records of our provincial and local institutes, will increase from year to year if these records be preserved continuously. In this connection the REVIEW would earnestly advise every local institute to appoint always some fit person to send us a concise and impartial account of its proceedings. Such an account would show the growth of educational thought and action from year to year in the different sections of these provinces.

This number of the REVIEW is enlarged to twenty-eight pages to make room for Mr. Ganong's able article on Phytobiology. For a year past Mr. Ganong has been immersed in an atmosphere of the latest scientific thought and investigation at a German university. He sees what results to science must follow the study of Acadian plant life, and he hastens to send a message to his brother workers here. The REVIEW is glad to publish this because Mr. Ganong's work and his example of persistent investigation are stimulating. The article is not only for botanists; it is for every thinking man and woman. It will bear reading and re-reading, and if we read between the lines, it urges us not only to study plant life and development, but life in all its phases. And what more fascinating and fruitful study for a teacher?

TEACHERS or others who wish to make a holiday excursion to Europe, should read the advertisement of Miss Crow in another column. The prospect is a very tempting one.



A GENTLEMAN handed the REVIEW a dollar recently with the remark: "I am not directly interested in your paper, but I think one feature of it should be encouraged: You allow no miserable quack medicine advertisements in its columns." Yes; the REVIEW prefers instead to give this advice: Be cheerful, take plenty of sleep, work hard, live honestly, soberly and uprightly, breathe plenty of fresh air, "throw (quack) physic to the dogs;" and—if you are really sick—consult a reliable physician.

THE N. B. Natural History Society of St. John will tender a reception and conversazione on the evening of Thursday, June 28th, to the members of the Teachers' Provincial Institute. The main object will be to show the resources of the province, as represented in the Society's excellent museum. In addition there will be a large number of microscopes in charge of skilful manipulators to illustrate natural science work in detail. The associate members of the society, composed of ladies, have in hand other arrangements to give the visitors a cordial welcome.

MESSRS. SELBY & Co. of Toronto, will exhibit a full line of kindergarten materials at the meeting of the Teachers' Institute in St. John, this month. The exhibit will be an interesting one, and should be attractive to teachers of all grades. The enterprise of the publishers in advancing kindergarten work is deserving of recognition.

THE report of the Annapolis and Digby teachers' Association is received, but too late for insertion in this number. Contributors should remember that articles should reach the office of publication about the first of the month.

IMPERIAL BRITAIN is the title of a drama suitable for public school exhibitions, just published by the Messrs. Mackinlay & Co., Halifax. It is neatly printed, and has received warm commendation from many teachers.

MR. W. J. GAGE, the well-known publisher, has offered \$25,000 towards the erection of a hospital for consumptives in Toronto, provided the city council will furnish a site. The only condition imposed on the trustees who may be appointed to manage the institution, will be that several beds shall be reserved for free patients—one for those who have belonged to the teaching profession. If Mr. Gage's generous donation be supplemented by a similar amount, a home for consumptives will be secured that will be creditable alike to the projectors and to the city of Toronto.

THE attention of our Nova Scotia readers, especially of teachers, is called to the Prize List of the N. S. Provincial Exhibition Department of Natural History and Education. The schools will be greatly benefitted if their pupils are encouraged to compete for prizes or medals for the best collections of minerals, plants, insects, school work, etc. The medals which are won only by the few, are after all but a small recognition of the gain which rewards all who try. The interest in natural history which is created, and the great additional knowledge obtained, are the substantial rewards which come to all competitors alike. Besides, the collections made can be kept in the school museums and utilized for teaching purposes. Every school worthy of the name has of course a natural history collection. We hope then that the readers of the REVIEW will give the Exhibition their heartiest support. A copy of the prize list, with full details, has been mailed to every teacher in the Province of Nova Scotia. See advertisement in another column.

#### A FEW WORDS TO SUBSCRIBERS.

The work of establishing a paper is not an easy one, especially an educational journal. Many teachers feel that they cannot afford the outlay; some lack the proper professional spirit, either to take the paper or pay for it when it is taken and read. The REVIEW is to be congratulated that it has very few among its patrons of the latter class. But it was not so in the first few years of its history. Many needed a good deal of persuasion to take the paper, and when taken and read they needed a good deal of persuasion to get them to pay for it. Some thought that they were giving the money and not receiving any direct benefit. Some thought that if the paper was continued to them after the lapse of the year subscribed for they could read it, but were under no obligations to pay therefor. Others were offended if a bill was sent and curtly refused to continue the paper.

Fortunately we have seen a better professional spirit grow up. Teachers see that it is to their interest to have a paper of their own. Its success marks their own advancement. And we have seen grow up a more business-like and honorable way than of receiving the paper without paying for it, or refusing to pay for it, on the ground that "I never ordered it after the first year." The large majority of our subscribers promptly pay for what they receive and read. They now receive bills, as a matter of course, and remit more or less promptly as their circumstances permit.

But there are some who go out of the profession and forget to notify us to have the paper discon-



tinued. Very many of these are ladies about to enter matrimony. Their perspective bliss causes them to forget the small business matter of writing a postal card to the publisher, asking to have the paper discontinued, thus causing loss to him and annoyance to them in the shape of future dunning letters. Other change their place of residence and forget to notify us. The paper is returned with "left the place" or "refused" marked upon it. The small matter of sending a postal card asking us to change the address or discontinue, would be but a slight trouble, and would be much pleasanter and more satisfactory to us. We do not wish to force the REVIEW upon any one. We are always sorry to lose a subscriber. But we always feel respect for one who discontinues in a business-like way.

A few weeks ago we notified by postal card the few of our subscribers who have allowed themselves to get two or more years in arrears. Some of the replies were very satisfactory, others not so. Of the latter the following is a sample, after the subscriber had been receiving the paper for about three years:

EDITOR OF REVIEW:

*Gentleman,*— please stop sending the REVIEW. I signed for one year and one year only. I thought you would stop sending at the closing of the first year. But when you didn't, I will take the liberty of telling you to stop sending it.

Yours sincerely,

This is another letter, which restored our faith in human nature:

EDITOR REVIEW:

*Dear Sir,*—Your card received, and am sorry you were compelled to so notify me. I have in the past received notice of my indebtedness, and simply through neglect I did not send the money. However, I will do so now. Enclosed you will find a P. O. order for five dollars which will pay all back subscriptions and entitle me to the REVIEW for another year. It would seem by my carelessness in not remitting that the REVIEW was not appreciated by me, but such is not the case. Many times I turn to its pages for help and information, and must ask you to accept an apology for my negligence. Wishing the REVIEW success.

I am yours,

Very truly,

Our readers will pardon us for referring at such length to these business matters. We feel that what we have complained of is largely due to want of thought on the part of those referred to. With this explanation, there need be no misunderstanding between the REVIEW and its subscribers, the relations between whom have been so pleasant in the past, and which, we hope, may become more and more pleasant in the future.

### N. B. PROVINCIAL INSTITUTE.

Another session of the Institute is about to be held. Complaint has been made by some teachers of the monotony of the proceedings. This is not true more of teachers' associations than of similar ones held by other bodies. The routine work of necessity varies little each year. Great bodies move slowly, and it takes more than one year to complete most measures.

It is probable that changes in the course of instruction will be considered this year by the Institute for the last time—for a few years at least. The changes in the course depend largely upon changes in text-books. Some changes have been made in texts and many more have been proposed by the text-book committee, but the Board of Education has given no inkling as to its intentions, and how far it proposes to go in the direction advocated by the committee. There is one very important element in the matter, which does not usually weigh much with the average teachers' committee, but which is always present in the considerations of the Board—it is the sentiments of the ratepayer and voter. His influence is most potent, and as he pays all the bills he cannot be entirely disregarded by any. The average ratepayer may be persuaded, but the process is slow; driven he will not be—that trait politicians know well.

Haste must be made slowly in all changes which increase the burdens upon the tax payers, and it would be well for the institute to take cognizance of this. Some changes have already been made and probably more are necessary, but they must be made so as to arouse the least opposition and very gradually.

It is an impossibility to frame a course that will not incur criticism. The present course, while it has not been an exception in that respect, has been a fairly good one; but changes in texts and varying conditions in education renders it necessary that any course should be altered from time to time. That time has arrived for our present course of instruction and there should not be further delay.

### CONFERENCE ON MATHEMATICS.

In the March number of the REVIEW we reviewed briefly the report of the Committee of Ten of the National Education Association. We propose now to cull a few thoughts from the reports of the conferences, on which the general report was founded, beginning with the report of the conference on mathematics.

It is recommended that "the course in arithmetic be at the same time enriched and abridged." It is to be abridged by the omission of all subjects involv-



ing obsolete denominate quantities — all exercises requiring for their solution processes essentially algebraic, and all subjects which require for their clear and easy comprehension some actual practice in business transactions.

The problems should be all of the most directly practical character, arising naturally from the pupils' environment. That is, they should be of such a kind as are most likely to meet the pupil in after life, and should be presented to him in the form in which they will probably occur.

Abstruse problems afford a certain amount of mental discipline which, however, is not so useful or healthful a mental exercise as the rapid, accurate and objective solution of concrete and practical problems arising out of every day life.

A certain kind of muscular power may be acquired in heavy gymnastics, but it is a faculty which is neither so useful nor so pleasurable as that acquired by the delightful and all-round developing games of the play-ground.

We might institute a similar comparison between the tread-mill methods of ordinary teaching in the ancient languages and the delightful language training that might be obtained from a well-conducted course in English literature and English composition.

But to return to our subject we heartily endorse the idea that algebraic problems be deferred until they can be treated algebraically, and that the more difficult exercises in commercial arithmetic be left for business colleges. That the teaching should be by concrete problems, that correctness and facility should be emphasized, and that the interest of the pupil should be secured and held by the evident practical utility of the work in which he is required to measure, weigh, estimate and inductively frame his own rules.

The second recommendation of this conference is very important, and on the exact lines laid down in the Nova Scotia course of study nearly two years ago.

From the time the pupil enters the kindergarten he is to be made familiar with geometrical conceptions by drawing, measuring and modelling. After the age of ten he should devote one hour each week to the construction, with and without instruments, of various figures, plans, maps, etc., carefully drawn. By experimental methods he can learn the leading truths of plane and solid geometry, and thus be prepared to enter on the more exact methods of proof with clear fundamental conceptions, which will make his subsequent progress easy, pleasant and rapid.

The regular study of algebra should begin at about the age of fourteen. Five hours a week for one year, and half that time for the next two years will enable

the ordinary pupil, if well taught, to master all that is necessary before entering college. The difficulties of algebra will be greatly lessened if in the arithmetic course the pupil is familiarized with the use of literal expressions as representing numerical values. Much attention should be given to radicals and to fractional and negative exponents.

In formal or demonstrative geometry the conference recommends: (a) A very clear understanding of the geometric axioms and postulates. (b) The direct comparison of magnitudes, rather than the numerical or algebraic methods of arriving at their relations. (c) Rigorously accurate and elegant proofs. (d) A study of the relations of geometrical proofs to the forms of logic. (e) The invention of constructions and proofs by the pupil leading him to construct his own geometry. (f) Some attention to projective geometry.

Assuming all these recommendations to be sound, as they undoubtedly are, to what changes in our course of study should they lead?

1. We are greatly in need of new arithmetics. Those now in use run counter to nearly every principle laid down.

2. In the study of arithmetic during the last two years of the course, the simpler forms of algebraic equations should be made familiar to the pupils.

3. During the same time a simple text-book on constructive geometry should be in the hands of the pupils.

4. The text-book on formal geometry should begin with a short chapter, intended to illustrate the use and nature of the axioms.

The numerical method should appear only in the appendix. There should also be a chapter on modern geometry. With these improvements Hamblin Smith's geometry would equal the best.

#### LENGTH OF SCHOOL SESSIONS.

A school board in Montreal proposes a new departure in the matter of school hours. The proposition is to have one session, from nine until one, during *six* days in the week. Excess of school work is to be followed by excess of recreation during *six* days in the week. Most teachers would object to the Saturday teaching at least. In some of the cities in the Maritime Provinces it has been the practice to have what is called one session (9-1) on stormy days. It was a novelty at the start, but teachers came to dread it, especially those having younger pupils. Pupils can not fix their attention to do satisfactory mental work when their stomachs crave food. They become restless and inattentive. Even the teachers become nervous and



irritable. Pupils in the first two grades should not be kept at work longer than three hours at a time—two and a half hours is better. In most towns an hour and a half is allowed for noon. Out of this must be deducted twenty minutes, because they are required to be present that long before school time. This means in most cases a hurried walk to dinner and an equally hurried one back to school immediately after dinner. According to the laws of health this is decidedly wrong. What is true of the teachers is equally true of many of the pupils. It is possible that in conformance with our present school hours, we are laying the foundation for a race of dyspeptics. A few towns recognizing the disabilities which teachers and pupils labor under from the length of the noon recess, give two hours noon and dismiss a half hour later. This plan is worthy of consideration. It might also be considered whether ten instead of twenty minutes, would not be sufficient for the teacher to be present before school time.

#### THE COMPULSORY SCHOOL LAW DEFECTIVE.

“Pupils should only be allowed to leave school at the age of fourteen when they have *bona fide* and respectable employment to go to. There are numbers of boys and girls who leave school when they reach their fourteenth birthday, and who then begin a systematic course of idleness—the boys about the street corners and girls about home—till they are sixteen, seventeen, or eighteen. It is all over with the majority by this time as regards usefulness, for they have learnt to do nothing, and the boys simply develop into larrakins, and the girls into—well, household drones or parasites—too lazy to work at home, and too proud and conceited to take respectable domestic service abroad.”

Our compulsory school laws may be doing some good, but they are seriously defective in not compelling the attendance at school of unemployed children after the age of fourteen. Those of that age who dislike school, and consequently stand most in need of the training it has to give are the most likely to leave even one, two, or three years before they can find any employment, especially if they live in towns or cities. In country sections this evil is not so serious, for the farm affords employment, or if not, love of society keeps the pupil in school. The city boy not only knows that he may leave at fourteen, no matter if he can barely read, but he has almost come to think that the law expects him to leave. At all events the fact is that experience shows that since such compulsory laws came into force, the most backward of the older pupils do not stay in school as long as they did formerly. This is greatly to be deplored. While the primary departments are crowded, the intermediate departments are poorly attended, though teachers and accommodation are provided. A clause compelling

the attendance of unemployed children for two years longer would fill many seats now vacant without increasing the cost of the schools. But what is more important, it would save many boys in Halifax, St. John, and all the large towns, from contracting idle and vicious habits, and give them that minimum of education, without which, no person should be entitled to the privileges of citizenship. We call the attention of our school boards to this important subject.

#### THE SCHOOL AND THE FUNDAMENTAL INDUSTRY—FARMING.

In this country—in almost every country—farming is the fundamental industry. This fact should be kept constantly in view by those who either in higher or lower places direct the educational policy of our country. The framing of courses of study is too much influenced by mere scholars—men whose knowledge and sympathies hold no vital relation to the main currents of our national life. In politics we are not represented by a sufficient number of farmers and mechanics. The vast majority of our teachers is composed of women whose knowledge of farming is almost *nil*, though their sympathies may be all right. Our male teachers mainly aspire to be professional men—none of them aspire to be farmers.

Altogether then, the trend of educational work and thought are away from the farm, and this to such an extent that the young people try to get away also. The conditions of successful farm life, the training necessary to make good farmers and the aspiration of farmers, have all changed very much within a few years, but our system of education in their relations to the former have not changed to meet the changed circumstances.

We do not claim that we should specially educate to make farmers, but we should so educate that our people will be enabled readily to adapt themselves to changes of environment. We certainly should not educate away from the farm. The education that will in the long run pay the country best, must take into account the necessity for a fair insight into the laws governing the material world around us, and vegetable and animal life, as well as, or rather in preference to, the laws of the Latin subjunctive mood or the feudal system.

“The boy on the farm—and the girl quite as much—needs to know the things under his feet and over his head, the soil, the life in and on the soil, and his relation to them. He should learn to see well, and to use all his senses. Every child should become an investigator,” and his training should be such that intelligence, scientific interest, reasonable profit and



contentment will be the characteristics of farm life. When the education and training of teachers and the changes in our courses of study are such as to secure these results, we may hope to prevent that swallowing up and destruction in the vortex of city life of so much of the best that the country districts produce. It is the duty of teachers then to strive to educate their pupils away from the artificial and the unreal, and to bring them nearer to nature, in order that knowing more of God's handiwork they may have the greater reverence and spiritual insight, as well as master the forces upon which their existence here in comfort largely depends.

#### PEDAGOGIC DEGREES.

Dalhousie University offers the Diploma of Literate in Education (L. E.) to those who pass satisfactory examinations in Psychology, History and Theory of Education, Practice of Teaching, Practical Chemistry, Practical Physics, Mineralogy, Physiology, Botany and Drawing. Before entering on this course candidates must furnish evidence of general education equal at least to that implied in the possession of Grade B Provincial High School Examination. They must pass a satisfactory course of not less than 400 hours in actual teaching. They are required also to be proficient in Manual Training and Tonic Sol-fa.

At a recent meeting of the Senate of the University of Toronto, a statute creating the degree of Bachelor of Pedagogy (B. P.) was read a second time and passed.

It prescribes: (1) That the candidate must hold a degree in arts, obtained after a regular course in some university in the British dominions, and also a first class public school or an assistant's high school professional certificate from the Ontario Education Department; (2) He must pass an examination in Psychology, the science of education, the history and criticism of educational systems, school organization and management, and methods in English, mathematics, Latin and one of the following: Greek, natural science, (biology, physics and chemistry), French and German.—*Educational Monthly.*

MR. DODGE, of the Victoria School of Art and Design, has just completed a very successful course of lessons to the teachers of Halifax in object drawing. His work will be followed up by Sister Columba, of Mt. St. Vincent academy, who has had a thorough training in the best American methods. Miss Ryan has a large class of teachers in Tonic Sol-fa. She has prepared a text book on this subject for the schools of Nova Scotia. It will be published shortly, and will be a great improvement on any that has hitherto appeared.

#### TALKS WITH TEACHERS.

This is the period of examinations. Many of you expect to be examined for advance of class, and many more of you have pupils who will undergo them before beginning their career at the normal school or college.

There are factors other than scholarship which aid toward passing a creditable examination. Nervousness is a frequent cause of failure. It may be said generally regarding this, that familiarity with the subject begets confidence in nearly all cases. Be careful, however, that you do not overdo this by constant grinding up to the very hour of the examination. Shut your books when you reach the station of examination. The exertion of writing the papers is quite enough, and any study during that time is feverish and unnerving. Take plenty of out-door exercise and retire early. Do not carry supposed failure in one subject into another, and bear around a useless burden with which to worry yourself and others. Be careful as to the make up of your papers. Do not despise neatness. Be sure to read over your papers before folding them. Begin with the question that seem easiest to you.

There will be many new teachers graduate from the normal school this year, and probably nearly all expect to teach. You must remember that inexperience has disadvantages. You can not expect all at once to take the place of experienced teachers. You have first to prove yourselves. Honors gained at the normal school may show your capacity as a student, but they do not invariably indicate the successful teacher. Do not when applying for a school expect an answer at once even though you enclose a stamp for a reply. Trustees do not meet every day, and many of them are discourteous enough not to be prompt, and even not to answer at all. Do not expect that the Inspector can in every case place you at once. Trustees are fond of exercising all their prerogatives, and often when he knows there is a vacancy, he does not wish to thrust a candidate upon their notice unsolicited. Have patience—the best situations generally fall to them that wait. Do not apply for any school unless you know there is a vacancy. Do not begin teaching in your own district. Strangers will not find half the fault, and will give double the credit that your own people will.

If you have pupils who have applied for admission to the normal school entrance examinations, let them be sure that they have received a postal in acknowledgment of their application. Ask them to preserve



this card. It is useful in case of any mistake on the part of the examiner, and may serve also as an aid toward the identification of the candidate.

We all have our ideals of what a school should be, and many of us would have surroundings far otherwise than those existing. It was my privilege a few days ago to visit the schools of one of the smaller towns of the Province—a town which, by the way, has seen better days, and which by some has been thought conservative and somewhat behind the times. I, for one, after looking over its schools can not agree with that estimate of the place. Externally, the school buildings were in the best of repair, and well painted, the grounds and premises were spacious, carefully kept, and tastefully laid out with young trees. Internally, the rooms were in some cases beautifully decorated, and in all cases were adorned with pictures, which, though not expensive, were in good taste. In each room there was a large table upon which were copies of such periodicals as *St. Nicholas*, *London Illustrated*, *Youth's Companion*, etc., for the pupils' use during recreation hours. In each building there was a well selected and well cared for library. The schools were well supplied with all needful apparatus, and it did not appear there for ornament only. In some of the rooms were small cabinet organs hired by teachers and pupils. When there was singing the large boys did not hang back, but joined in with the others with the best results. I was invited into the school grounds at recess to observe the physical exercises. The marching out of each school was beautifully exact, and was accompanied with music. Each school upon the grounds was captained by one of the larger pupils. Physical exercises and military drill were given with the greatest precision by all the pupils in the building. The flag was saluted, and all marched in again with the same regularity. It was one of the best exhibitions I ever saw.

Upon the school grounds was a horizontal bar, and I noticed that the boys were very athletic. So much so, that on the afternoon of Arbor day, sports were indulged in with great zest, and records were made that were most creditable, while the citizens looked on with the utmost approbation. I noticed that in whatever was undertaken, the teachers were earnest, the pupils eager, and the school board and rate payers most appreciative. I concluded that as far as its schools are concerned, that this is a most progressive town, and considerably in advance of some more pretentious ones. Do you not think that devices such as exist in this town, give a great impetus to school work?

### A. Outline of Phytobiology.

*With Special Reference to the Study of its Problems by Local Botanists and Suggestions for a Biological Survey of Acadian Plants, by W. F. Ganong, M. A.*

Read before the N. B. Natural History Society, May 1st, 1894.

#### FIRST PAPER.

It is clear to all botanists who note the signs of the times that the study of local botany must take a new direction in the near future. Up to the present, under the favoring influences of intrinsic æsthetic interest, abundance everywhere of easily-handled materials, accurate terminology and excellent manuals, the systematic study of flowering plants has been the department of natural history most cultivated by those of scientific tastes, who must work without special training and away from the great centres. Hence has risen the great class of local botanists. Their relationship to the science, however, has been one of reciprocal advantage, for not only have they derived from it an occupation of elevated pleasure, of high educational value, and of radiant good influence, but it in turn has profited greatly by their thorough explorations of local floras.

But this mutually beneficial adjustment is becoming unbalanced. Not only on the one hand are the local botanists by their very devotion exhausting their field of systematic usefulness, but as well on the other, through the consequent narrowing of opportunity for original investigation and loss of its stimulating charm, the subjective value of the science to themselves is being impaired. Discoveries of real worth and studies in pursuit of new truth can now, for the most part, be made only at the expense of journeys from home often longer than time or means justify. The question, then, is forced upon us: In what direction lies a new field for the local botanists such as will yield them intellectual profit for themselves, and in which their enthusiasm, opportunities and local knowledge can be utilized for the advancement of botanical science?

Happily there need be no hesitation as to the answer. Through the studies of the younger professional botanists, particularly of Europe, there is being developed the new department, almost the new science, of Phytobiology. It offers in



the highest degree opportunities for unlimited usefulness, and it is to be moreover the leaven of the botany of the future.

In the three provinces of Acadia we possess rich material for phytobiological study, skilled and earnest workers, and scientific societies for the correlation and communication of results. Under these favoring conditions we can enter with confidence upon the new work. And it is a fortunate coincidence, which we must not overlook, that its pursuit under the auspices of this Society will distinctly further the highest object of the Society's existence, the collection of data for a true natural history of Acadia. We have therefore a double stimulus to the careful consideration of the subject before us.

#### I.—THE RELATIONSHIP OF PHYTOBIOLOGY TO THE OTHER DEPARTMENTS OF BOTANICAL STUDY.

In order to thoroughly comprehend the scope of phytobiology it is needful to examine briefly its relationship to the other departments of botany. It will be useful also incidentally to note where to the latter the local botanist can be of service. It is of course understood that the advancement of knowledge in all departments must depend upon the specialists, who alone can command the requisite training, libraries and collections.

The vastness of the range of botanical study has made needful its division into departments. These, based mainly upon convenience, cannot be logically distinct and must merge often one into another. As they have practically segregated themselves, they are about as follows :

I. **SYSTEMATIC BOTANY**, the study of the relationship of plants to one another. Its ideal is to construct the real genealogical tree of plants. Based in the past chiefly upon anatomy, its future advance must be through aid of morphology, which alone affords a true guide to genetic relationship. As hitherto, the local botanist can assist by exhaustive local explorations and communication of his results to the specialists.

II. **PHYTO-ANATOMY**, the study of the actual present structure of plants and their parts, apart from causation. In its larger aspects it is rarely studied apart from systematic botany, but in its microscopic phases, the anatomy of cells and tissues (**HISTOLOGY**) it is a distinct division of importance, studied at its best upon morphological principles. The local botanist cannot serve it.

III. **PHYTO-MORPHOLOGY**, the study of genetic origin underlying adaptive form in plants. By penetrating the disguises imposed by special function, and laying bare real history it becomes the chief reliance of the modern systematic botanist, and is most closely bound up with the higher phases of phy-

tobiology. Its chief auxiliaries are *teratology*, the study of monstrosities; *embryology*, the study of the unfolding of the plant from its earliest germ; and *comparative anatomy*, the comparison of graduated series of structures. It is the philosophical basis, or as Darwin calls it, the soul of natural history. The local botanist can serve it by collecting and noting the conditions of monstrosities.

IV. **PHYTO-PHYSIOLOGY**, the study of the *vital* processes of the plant. It has to deal chiefly with questions of chemistry and physics, requires for its advancement unusually special training and cannot be served by the local botanist.

V. **PHYTO-PATHOLOGY**, the study of plant diseases: Of these by far the greater number are caused by parasitic cryptogams, the practical difficulties of the study of which have caused them, together with the non-parasitic lower plants to be grouped together for study under the department of **CRYPTOGAMIC BOTANY**. As it likewise includes the systematic study of these forms, local botanists can render great service by the collection and communication to the specialists of all fungi and algae, with the most careful observations of the conditions of their occurrence.

VI. **ECONOMIC BOTANY**, the study of the relationship of plants to man's good and injury. Up to the present this department has been in the hands of practical men, has had no principles and no scientific status. Its discoveries have far oftener been the result of accident than of research, a natural corollary of the fact that the usefulness of a plant to man is mainly a matter of accident and not of adaptation, some feature developed in and for its own economy happening to accord with some need or peculiarity of his. In the future it is to become an organized scientific study. The local botanists, by careful observation of effects of plants upon other organisms, may gain hints revealing new uses.

VII. **BOTANICAL GEOGRAPHY**, the study of the distribution of plants over the earth's surface. Upon the largest scale it deals with the great floras of the earth, the relationships of which are solvable only by aid of palæontology and geological history. The special phase of it dealing with distribution within limited areas, belongs rather in the consideration of locomotion and competition, in phytobiology proper. To the former the local botanist can be of use by making his lists as full, accurate and discriminating as possible; to the latter he can be of the greatest service, as we shall later discover.

VIII. **PHYTO-PALÆONTOLOGY**, the study of fossil plants. The local botanist can be of service by the collection of the fossil plants of his district, if any, and their communication to the specialists, not forgetting that there are valuable late clay, bog, and lake-bottom, as well as earlier rock-fossils.

IX. **FOLK BOTANY**, the study of plants in their relationships to folk-lore, folk-uses, superstitions, traditions, history. It includes the study of all aboriginal and other unwritten lore, knowledge and names of plants. It has contributed many, and may be made to contribute more, facts of importance to economic botany, ethnology, philology, history. The local botanist can be of the greatest service by the careful collection and publication of all Indian and other local plant-lore and names.

X. **PHILOSOPHICAL BOTANY**, the study of origin and causation in the development of plants. Its principles, the same as those of Philosophical Zoology, we are accustomed to group together under the term evolution. Its advancement requires the highest possible qualities and opportunities, and the local botanist can hope only to follow, not to further it.



XI. PHYTOBIOLOGY, the study of the immediate relationship of plants to their environment. It views plants not only as living, but also as plastic beings, moulded in the past and in the present by their surroundings, and to some extent reciprocally affecting them. It has primarily to do with *adaptation*, or fitting of form and structure to function. When it traces the structural history of an adapted part, it employs morphology, which is thus inseparably connected with it; and where it considers that history causatively or dynamically, it approaches philosophical botany. It investigates the use or meaning of form, color, size, position, and the like in plants and their parts. It is therefore the most living and generally interesting department of botany, and is destined to expand enormously in the future. The relationship to it of the local botanist has been indicated already, and will now be traced more fully.

## II.—THE NATURE AND METHODS OF PHYTOBIOLOGICAL STUDY.

Phytobiology, as we have seen, is the study of adaptations, that is of the arrangements by which plants and their parts are brought into responsive contact with external influences. It investigates in all degrees the effects upon plants of the external phenomena of the world, that is, force in all its forms and matter in its various states; and as well considers the utilization of these by plants in their organic necessities, nutrition, locomotion, protection, reproduction, competition. From the most general relationships of influences and necessities, resulting in the formation of the primary organs of plants, it proceeds through all grades to the most minute analysis of details, explaining the most superficial characteristics of form, size, color, position.

The study of the re-action of the plant to the conditions of its environment would be comparatively simple were we concerned but with the present, and a completely plastic plant. But in fact all of the complexities of relationship of the past, the resultant effects of which we are accustomed to designate *heredity*, together with a little-understood *internal constitution*, of which variation is the most important phase, and which may or may not be included with heredity,—these two impose great restrictions upon the operation of the present environment. Every plant, and every part of it, represent the resultant of an enormously complex inter-operation of the influences of these three conditions—heredity, internal constitution and present environment, and each of these plants and its parts is in a state of unstable equilibrium, and readily alterable through movements in the

environment. The delimitation of the effects of these influences upon plants is the ideal of phytobiology in its most philosophical phases.

Viewed in this light, phytobiology certainly does seem the most difficult of the departments of botany. So in its higher branches it is, but like all other branches of science, it has three grades: first, the observation of facts; secondly, the correct interpretation of the immediate meaning of these; third, the composition of knowledge thus gained into the principles of a science. It is in the first and second, but especially in the first, that the local botanist can render invaluable service. The first great need of phytobiology, that upon which its progress depends, is accurate observation of fact in the field; for it must be remembered that it deals with living things in action and the laboratory or herbarium can help but little. Field study of how plants behave in relationship to the external world is the great aim which the local botanist should keep clearly before him.

Limiting ourselves now to the subject from the point of view of the local botanists, we have to consider first of all certain general principles.

The first pre-requisite for active work in phytobiology is an acquaintance with what has already been learned, and some idea of the problems to be studied. The best single work upon the subject is unquestionably the admirable "Pflanzenleben," by Kerner von Marilaun, of course in German, as are the other very important works by Goebel, Schimper, Warming, Stahl, Kihlman, and others. Unfortunately there is no such work in English, and it is to supply in some measure this want for Acadian students, that a series of articles upon the subject will follow the present one.

The other great pre-requisite is a proper training in the three scientific faculties—observation, experiment, judgment.

We have already but just referred to field study, and the local botanist's opportunities for it. It cannot be emphasized too often, nor too strongly, that just here is his true field, and that his greatest triumphs will come from his observation of nature in action. It is under the extreme conditions of nature that her adaptations are best seen, and in all seasons and times and weathers



the observer should be abroad, alert, persistent, sympathetic. The effects of storms on the branches, of rain on the flowers, of heat on the leaves, of birds on the fruits, of innumerable other external agencies, can be learned only by seeing them in operation, and they make clear the responsive adaptations in plants. The observer, indeed, is greatly aided by this dual nature of his problems,—the operations of agencies upon the plant, and the adaptations in the plant to the agencies; either may form a guide in the search for the other. The field observer can settle what the indoor worker can but guess at, and make discoveries of what the latter would never dream. But the more concrete treatment of this most important matter belongs under the special sections to follow.

The great adjunct of observation is apt experiment, and for phytobiology this of the simplest and most direct sort. The mere cutting away of a branch, the isolation of a flower by a muslin cover, the pinning of a leaf to a fixed position are types of simplicity of experiment which have made clear some of the deepest principles. By what simple methods great truths can be laid bare is illustrated by Darwin's phytobiological work, particularly upon insectivora, fertilization and seed-dissemination, and the student cannot possibly do better to prepare himself for similar work than to study these classical models. We shall have much more to say upon this subject under the special divisions to follow.

The training of the judgment, axiomatic for all good scientific work, has a particular application to our present more limited topic in connection with the nature of adaptation. As we have seen, not all the characters of a plant are adaptive. Some are simply inherited and of little or no direct use; and others are incidental to something else. The line separating inherited or genetic characters from those adaptive or immediately useful, is extremely shadowy and shifting, and the relationship of the two is of the most varied degrees. In general, the student may feel sure that the most superficial characters—form, color, size, position, etc., are immediately adaptive to readily-observable agencies, while the deeper seated characters are either adaptive to more general

agencies, or are inherited and not now of vital importance. One may obtain a rough measure of the immediateness of adaptation by noting how far the given character runs throughout the relatives of that plant. If only specific, it is probably easily discoverable; but if generic, or tribal or ordinal, it becomes proportionally deep-seated and more difficult to detect. But ever there comes in also the third term of the life-equation, which is almost unknown, hence making it so difficult to solve it to the fourth. Heredity, environment, internal constitution are the three; use or reason for being is the sought-for fourth.

Again, the student is often misled by what seems to be adaptation, but in reality is not, which teaches that conclusions cannot be safely drawn from a single line of observation. Thus the presence of the sexual organs upon the *under* side of the prothallia of ferns seems to be a distinct adaptation for placing them where the water necessary for their fertilization is most abundant. Yet experiments show that they seek not the wettest but the darkest side, and if light be thrown up upon them from below, these organs develop upon the upper surface. Indeed, very few facts can be settled from observation alone; it is always better to confirm observation by experiment. Again, one must be on the watch lest he take single individual adaptations or accidents or sports, as characteristic of the whole species. The power of individual response to some special conditions is in some plants remarkably great, and it may accidentally or intentionally be brought about. The result may be extremely valuable experimentally, but it is not a safe guide to the real cause of adaptation in a state of nature. Numerous observations under varying conditions in the field, with concise control-experiments—these, we repeat, are the tools of the local phytobiologist.

It remains in this connection but to point out that there are three phases of phytobiological study to be applied to every plant. There is first the investigation of the *raison d'être* of its individual characteristics; secondly, the consideration of it as a member of a biological group; and thirdly, its consideration as a member of a climatic group. The sundew catches insects in one way, nepenthes in another, thus showing



individual adaptations; both have characteristics in common as members of the biological group insectivora, while the former has yet other characteristics in common with its neighbors in cold northern bogs, the latter with other epiphytes in damp tropic forests. *Salicornia* and a cactus have habits different enough, yet they have many characters in common as members of the biological group of succulents (water-holders), while yet, again, the former has much in common with other sea-shore plants, and the latter with other dwellers in the desert. So there are groups within groups in adaptation, and the student has to take account of generalization as well as particularization.

### III.—THE PHYTOBIOLOGICAL STUDY OR SURVEY OF ACADIAN PLANTS.

The three Acadian provinces offer to the student of phytobiology a field of unusual attractiveness. It is true we do not possess those extremes of physical conditions which give us such extremes of adaptations as are found on deserts, high mountains, or in the damp tropics, but we have approaches to them all. The great diversity of surface of Acadia, rich forest lands and intervalles, salt-marshes and sand-dunes, bare hill-tops and wind-swept cliffs, together with the richness of its flora, comprising, as it does, more than a third of all the many species found north of Tennessee and east of the Mississippi; and the great climatic changes of past times, all combine to make the plant life of Acadia of great interest, and of much promise in phytobiological results.

As this is true not only of questions of individual adaptations, but the presence of all of the great biological groups, insectivora, succulents, parasites, etc., with their problems, and the unusual variety of climatic groups, add to our advantages.

To proceed now to the treatment of the subject from the point of view of the Acadian student, we must first make some classification of the great subject. As elsewhere in nature none can be made which will be strictly natural and give exclusive divisions, but that to be outlined below seems best adapted to our purposes. Under each division we shall outline, (a) its most general principles, (b) their application to Acadian plants, (c)

present knowledge as to Acadian plants, (d) problems requiring solution. We are to confine our attention in the main to flowering plants. The divisions are as follows:

*A. The Adaptations of Plants to Inorganic Nature.* This includes the relationship of living matter to the very physical and chemical nature of the world, and to the laws of physics and chemistry. It traces how, as a resultant of all these external influences, the higher plant has been produced, with its three primary organs, leaf, root, stem. It further considers the response in these organs to variations in the external conditions—notably meteorological conditions with varying degrees of moisture, heat, etc., and forces brought to bear upon the plant, including, with others, gravity, wind, weight of snow, beating of rain, water currents, etc., or, in a word, all the variations of the external inorganic world. Here comes the treatment of the origin of climatic groups, and of the main causes of plant-form and size, and the structural phenomena of life-cycles.

*B. The Adaptations of Plants to other Organic Beings.* This includes their relationship to animals, protection from them by spines, chemicals, etc., and utilization of them for defence against other animals, and of their powers of locomotion for the transfer of pollen and scattering of seed. It includes also their relationship to plants of the same and other kinds, under the former treating the little known subject of competition and development of new races, and under the latter competition upon a larger scale, with its consequent forcing of groups into parasitic, water, and other special habits originating the biological groups. It includes also plant-symbiosis. In this division the whole subject of competition is most important, for the Darwinian hypothesis of evolution hinges thereupon, and very little of positive knowledge has yet been gained about it.

*C. Adaptations of Plants to Reproduction.* This includes the origin of the flower and its biological significance as an organ for securing the co-operation of two parents in the production of offspring. This introduces also the subject of cross-fertilization and the utilization of locomotive agencies for securing pollen transfer. Meaning of colors, shapes, time of flowering, clusters, etc.; in fact, all floral phenomena belong here, together with sexual reproduction and hybridization.

*D. Adaptations of Plants to Locomotion.* To prevent overcrowding and to secure the advantages of development under somewhat different conditions of soil, etc. Plants, like animals, must have the power of locomotion at some period of their lives. Being incapable of it directly, they have utilized the seed-stage as most practicable and adapted it to be moved by the ordinary locomotive agencies of the world about them—wind, water-currents, animals, etc. The ranging modes and degrees of perfection of the power thus acquired, together with the operations of man, produce important results in the distribution of plants within limited areas, and some such problems of unusual interest we have in Acadia.

*E. The Biological Groups of Plants.* These include the groups modified to a common special habit by influences other than those of climate, such as the parasites, insectivora, water-plants. Though present, they are none of them conspicuously developed in Acadia.

*F. The Climatic Groups of Plants.* As already mentioned Acadia does not possess extremes of climate, and hence has



not extremely adapted groups. But it has a great variety of conditions producing the following floras :

Strand,	Fresh-water,	Hard-wood upland,
Salt-marsh,	Salt-water.	Dry sea-cliff,
Sand-dune,	Intervals,	Hill,
River bank,	Barren,	Field and open place,
Bog, Soft-wood upland.	Weeds.	Swamp.

The characteristics of these, and their common response to their common environment is a most important division of our subject. Here must be considered also the causes which allow of the persistence of northern and southern colonies within our borders.

G. A Summary of the Biological Characteristics of the Vegetation of Acadia, correlating our previous studies, and bringing them into touch with other departments of botany, principally Botanical Geography and Botanical Philosophy. Here we must consider recent changes in the flora, and the causes of the introduction of northern and southern colonies, and finally the general phytobiological status of the Acadian flora.

So much for a general view of our subject. We have now to enter upon the special treatment of its divisions, one of which I hope to present each year to this Society. I have every confidence that Acadian Botanists and Phytobiology will prove reciprocally adaptive.

The University, Munich, Germany, March, 1894.

For the REVIEW.]

#### Lesson on the Lever.—Grade VII.

Who will bring me a spring balance? You may Andrew. Who will bring a yard stick quite stout? You may Charlie.

The weights, one and two pounds, were taken from our scales. A block of wood supplied the place of a fulcrum. A pupil was directed to place the weight, 2 lbs, on one end of the lever, the fulcrum as near the centre as possible, and the pull-down on the spring balance was exactly two pounds. Then a drawing of the bar was made on the blackboard by another pupil. The word arm was given, fulcrum explained, and power and weight. Then different lengths for the arms were taken. It was discovered that if the weight was at the end of the short arm, less power would be required; also if the same weight was at the end of long arm more power would be required to lift it at the end of the short arm. The relation weight multiplied by its distance from the fulcrum equals power multiplied by its distance from the fulcrum was now clearly brought out by actual measurement. Questions were given and solved. Then the application or use of lever shown in the crow-bar scissors. These were levers of the first class. Then levers of the second class were formed, and questions given and solved. In one or two cases the results did not agree, as the weight, 12 lbs., was

six inches from fulcrum and power. Thirty inches from fulcrum was only 2 lbs. 5 oz., and one pupil suggested the weight of lever be taken into account and then it was found that the results would nearly agree.

Of course the balance was delicate enough to record exact results.

Levers of the second class, as wheel-barrow, handles of pumps, cant dog.

Then the lever of the third class was illustrated with examples, as the forearm treadle of machine.

Only the outline is given above; each teacher could fill it in so as to suit his class. Two lessons would forever dispose of the lever so that the children would intelligently understand its application and principle.

LEX.

Bloomfield, N. B.

For the REVIEW.]

#### Halifax School for the Blind.

The census of Canada for 1891 states that there are in the County of St. John twenty-seven blind persons. Their ages range from babyhood up into the eighties.

All information with respect to the name, age or whereabouts of any of these twenty-seven persons will be gratefully received.

Physicians, clergymen, school teachers, or any persons possessing such information, will confer a favor by communicating with the editor of the EDUCATIONAL REVIEW, or with C. F. FRASER, Supt. School for the Blind, Halifax, N. S.

For the REVIEW.]

#### Early Flowering Plants.

Perhaps flower-lovers among the readers of the REVIEW would like to know what spring-flowers are found in the Western Counties of Nova Scotia, particularly in Yarmouth and Digby.

The first comer, beautiful in all save perfume, is the skunk-cabbage, whose flowers appearing in the bogs in March, are protected from the cold winds by their gay little hoods of purple and red and gold. Then comes the mayflower in all its delicate beauty followed closely by the yellow coltsfoot, white violets and blue, and dandelions.

The pale brown, naked, club-shaped fertile stems of the common horsetail (*Equisetum arvense*) and the sterile stems with their rigid green whorls are found by the roadsides, while the more graceful woodland horsetail (*E. sylvaticum*) is found in damp woods.

The delicate little goldthread grows abundantly, its yellow rootstock forming one of the exports of Yarmouth.

Among other flowers appearing in May, are the lance-leaved violet, *Smilacina bifolia* and *trifolia*, the



rosy-flowered twisted stalk, the *clintonia borealis* with its three or four glossy leaves, and its cluster of proud little bell-shaped flowers, the fly-honeysuckle (*Lonicera ciliata*) with its pairs of pale yellow blossoms, the painted trillium, the hobble bush viburnum, two varieties of Juneberry (*Amelanchier Canadensis*, var. *botryapium* and *oblongifolia*) the fetid currant, the common wild sarsaparilla (*Aralia nudicaulis*), the showy rhodora, and ladies' mantle (*alchemilla vulgaris*) with its fluted leaves and small light green flowers.

In June, the pitcher-plant, Indian cucumber, Labrador tea, linnæa and one-flowered wintergreen (*moneses uniflora*), with scores of others, will make their appearance.

Yarmouth, May 29th, 1894.

### The Bachelors of Arts.

Next week three universities in the Maritime provinces will turn loose on a cold world about fifty bachelors. This is about half the product of the year, as one college convocation has already taken place, and two are to come later. Doubtless we shall be told that these young men and young women are coming from college no more capable of earning their living than they were when they matriculated. In the case of some of them the statement is perhaps true. It will be equally true of some that when they have completed their purely professional studies they will still be unable to gain a respectable income. It is not the nature of some people to be effective. But those who have a capacity for any kind of productive work in whatever field of industry, ought to come out of college better equipped for life's duties than they entered. Knowledge is need in any business, and though not much exact practical information as to material facts can be acquired in a college course, the power of acquiring knowledge must be greatly developed by any honest course of college work under skilled direction. The bachelor leaves college without having acquired a trade or profession by which he can earn money. But he has a mind hardened to systematic toil, as work in the field hardens the muscles. He knows how to pay attention. He has acquired the power of concentration. He has, moreover, been experiencing mental development under the most stimulating surroundings. He has been associating with other earnest and ingenious youths, all in the period of the greatest intellectual eagerness. His attention has been directed to the best literature, and he has acquired some elementary idea of the ground work of the sciences. By this time he should have some preception of what he is fit for in the world. No time has been given him to make deep investiga-

tion into any branch of science or art, but at least he has had opportunity to measure his ability and to consult his tastes in a somewhat intelligent manner. A young man just out of college is sometimes a prig, but usually he is more modest than he was when he went in. He is apt to be judged severely by some of his elders, who are not college men, and who expect or pretend to expect all sorts and perfections to show forth themselves in him. They think that he ought to know as much about public matters as countrymen who have been reading the papers and listening to speeches during the college boy's whole lifetime. They are surprised if they do not have at his finger's end as much practical mathematics as the neighboring sea captain or land surveyor. The ancient cross roads theologian who has been arguing ever since he joined the church, thinks it an achievement to floor the young graduate in a controversy. The farmer finds him not as strong in chemistry as he ought to be, and it is easily discovered that he cannot talk to the foreign tramp in his own language so well as some phenomenon who has never been to school but has picked up languages by ear. But give the college lad a chance. In a few years it will be found that his work in the university, if it has been honest work, is fruitful. It will be seen that if he does not know much he has learned how to find out things. The boy who did not go to college, but got early down to his life work, will seem to have the best start for a few years. But a few years is not a whole life. Neither is the early acquisition of a competence the main thing in existence. Even if the professional start made during the first four years by the lad who does not go to college is not lost in after life, he may lose much of the enjoyment that he might have obtained, and may find that a drudgery which to a better equipped workman would be an easy and cheerful exercise—*St. John Sun, May 26.*

### Good Words for Canada.

[Read to your pupils the extract given below. It will foster the right kind of patriotic pride.]

Among the many excellent features for which Canada is admired by her big neighbor across the border are the respect manifested for the law, and at all times and in all places for the enactments of the legislature. For these national virtues the *Chicago Interior* has been paying the Dominion this tribute: "We are not so anxious to annex Canada as we are to see some of her good ideas transplanted on this side of the border. Throughout the whole extent of her vast western dominion you will not find an outlaw or hear of a case of lynching. It is not because she has to deal with a class of frontiersmen so differ-



ent from that of our own western states, but because she has laws and executes them. You can go nowhere, not even in the fastnesses of the Rockies or the isolation of the Selkirks, without finding the scarlet uniform of the mounted police. You will feel everywhere the presence of protecting law. You are made to realize that you are in a land of order, and that your person and property are under the care of the commonwealth. In too many of our own communities we are fast relapsing into that barbarism in which private revenge becomes the miserable substitute for public justice. In so far as we do this we are centuries behind our age." The fact that so much lawlessness and frequent lynching tragedies occur in the south and west give point and force to the remarks of the Chicago paper. It is to be hoped Canada will continue to deserve the good opinion so freely expressed by so influential a journal as the *Chicago Interior*.—*Exchange*.

#### E.lementary Composition.

Written composition exercises may be an adjunct of the reading lessons and of any language lessons. A preparation for the exercise may be similar to that made for reading. Subjects for composition should relate to things and topics studied in the school. Right use of capitals, and a few marks of punctuation, may be taught at this time, and in connection with written composition. Pupils may be trained to make a good oral expression of their acquired knowledge before they attempt to express it by writing. Penmanship may be taught in connection with this exercise.

The exercise of writing sentences should be introduced from the first entrance of the young pupil into primary school.

The first grade of composition will consist of a written expression or the products of observation; the second grade, of observation and imagination; the third will add a description of the products of the reflective powers. In all cases the composition prepared by the pupils should be the natural expression of natural mental products. Corrections are to be made on the use of words, on construction of sentences, on spelling and punctuation, and on the rhetorical and logical form of the composition.

The pupils are to be prepared for writing before they attempt to write. Composition writing, if rightly conducted, is one of the most productive exercises of the school.—*American Teacher*.

Stockholm has the highest death-rate from drink of any city in the world within thirty-five years, ninety in one thousand.

#### School and Vacations.

To the continental traveller, coming to the United States merely as an interested observer, three facts in the life and training of children fasten, as he has often declared, his attention. First, that during nine months of the year they have too much to do, and during three too little. Secondly, that during nine months they seem to be absolved from every human and cultivating duty, their whole family circle giving itself up to the hasty feeding of their bodies and to the scurry evidently deemed necessary to the acquirement of the studies which, like a black fog, loom up before them and above them from September until July, incapable of being shaken off, and yet impossible to wholly penetrate. Thirdly, that "education" seems to mean a plan which the instructor fits upon each child, rather than the educating from within of the child's own powers.

Is this an unfair estimate by the foreigner? If so, why then does he invariably receive this impression? Surely not because he looks for it, for it is diametrically opposed to everything to which he is accustomed at home. He does not even at first comprehend what his eyes and ears tell him; but when he does, he makes up his mind that he must regard Americans as material in their tastes, illogical in their educational views, and impervious to the laws of beauty. We know that this is not in every case nor in every community true. But is there, then, no foundation for the European's impression? \* \* \* What and how much should be required of children during the nine months, and how little during the three? Let educational inspectors and theorists think out that problem, remembering that no child was ever really refreshed by total lack of daily duties or by absolute freedom at any period of existence. Every human being, save in illness, has obligations, heavy or light—but still obligations—to perform; the child should have his little ones in summer as well as in winter. It is not for laymen to say how this should be arranged; but that it could be accomplished is true, and the time is fast approaching when the boards must consider the necessity of summer duties seriously if they would not have the long vacation days become the breeding time of vice and lawlessness, which no nine months of mental discipline or moral regulations, however filled they might be with studies in both, can obliterate.—*Harper's Bazaar*.

Prof. Virchow has affirmed his belief that no trace of "the missing link" between man and the lower animals has been discovered, either in the physical structure of modern savages, or in the human skulls which are believed to be the most ancient.



### The Age of a Tree.

Almost everyone is aware of the fact that when a tree is cut down its age can be determined by counting the rings, each of which represents one year's increment, but closer observers find in the irregularities of these rings and other signs a very faithful register of climatic and other conditions in any given year during the whole period of growth. The years of small rings, that is of little growth, were either very dry, or the tree was exhausted by bearing an exceptionally heavy fruit crop. The broad rings indicate abundant rain and good growing conditions. Brownish spots on the surface, looking as if they were worm-eaten, are evidence of a severe winter, the young sapwood formed in summer having been partly destroyed by severe cold, and the injured part covered over with sound wood the next year. The year may easily be fixed by counting the rings from the outside. If the layers of wood are not of uniform thickness all round they afford evidence that at this stage of growth there were conditions which hindered its growth on one side: The spread of its roots or branches has been arrested, perhaps, by a neighboring tree. The number of layers showing this irregularity indicates the number of years during which the tree was exposed to the unfavorable conditions. The student of forestry may learn lessons of practical value in the management of forests by a careful study of the annual rings.—*Literary Digest.*

### Nailbrushes.

A small girl was getting ready for school. Her mother thought she was a long time in the back kitchen, and called out to her: "What are you staying there so long for? You will be late for school." "I'm trying to get my nails clean," was the reply; "teacher has her's clean." The child had noticed the white border to her teacher's nails, and how different her black-edged nails looked. She made up her mind to be like her teacher in this. When she came to try, she found that what had been so long ingrained was not easy to remove: but she persevered bravely. Those whom children look up to and love do not often remember how closely they are watched and what influence they have, not only by their ways and words, but by what they show themselves to be even in little things. "Be what I am" is a far stronger appeal than "Do what I tell you." Habits of order and tidiness and self-respect are taught by example much more readily than they are taught by words. So with habits of courtesy and gentleness and self-restraint. So also with habits of reverence for holy things, and careful doing of duty to God and man.—*Selected.*

### The Normal School.

In the paper, *The Scope of the Normal School*, by M. V. O'Shea, in the June *Atlantic*, some contrasts are drawn between our methods and those of certain countries of Europe:

In Prussia, at the close of the year 1889, there were one hundred and sixteen normal schools under the direction of the government, all of which were preparing teachers solely for the people's, or elementary schools. No teacher can find a permanent position in these people's schools unless he possesses a diploma from one of the normals; and the effect of this is to draw into the schools only those who have had professional instruction. It must be granted that the work of the normal school, wherever found, and its relative position in a school system, must be determined by the character of the rest of the system, since it is not properly an institution of learning in itself, but a training school, designed to give healthy and wholesome direction to the schools that are concerned with learning in literature and in the arts and sciences. Now, in Prussia, teaching is a life business, and the teacher is a state officer, who receives a pension when he becomes incapacitated by age for profitable labor. The Prussian government is able to determine approximately how many teachers will be needed for the schools each year, and it can so order the normal school work as just to supply these needs. In our own country, of course, there is no such certainty; for no one has any idea how many new teachers will be needed at any given period, since very many of those employed at any time are only working under a sort of compulsion, looking forward to some fortuitous circumstance, such as marriage or a favorable business opportunity, to release them from their captivity.

Our elementary schools, too, it seems, are not regarded so highly by the people at large as are the people's schools in Prussia, and consequently the social position of our elementary teachers is not so favorable in comparison; and this does not encourage teachers of talent to go into our common schools, but leaves the places instead to persons with scanty preparation and culture as well as a lack of active strength and ability. In France, there are now about one hundred and seventy normal schools, or "training colleges," that prepare teachers for the elementary schools only; while several higher training colleges, such as the well-known *Ecole Normale Supérieure* at Paris, in the Sorbonne, and chairs of pedagogy at Lyons, Bordeaux, and Toulouse, affords the teachers in the higher schools whatever professional training they get. In Prussia, the departments of pedagogy



in the universities afford opportunities to prepare for the higher positions. In Scotland, the seven training colleges and the chairs of pedagogy at St. Andrews and Edinburgh prepare teachers for all grades of the schools; and here, as in Prussia, the state gives such protection and encouragement to its teachers as to lead all who enter the profession to remain there. In England, the efforts of the forty-four training colleges are spent mainly in supplying the elementary school with teachers, although work of a higher grade has been encouraged; and now Oxford and Cambridge are making provisions to prepare teachers for the higher positions. The normal school work in Austria and Hungary is much like that in Prussia, being made very definite because of the definiteness of the different phases of the school system as a whole.

In comparison with these countries, it can be seen that the normal school with us has as yet a rather uncertain field of work, so far as the preparation of teachers for any particular grade of school instruction is concerned.

#### Compulsory Education.

The State of New York has just put a new compulsory education law on its statute book. It provides for the punishment by heavy fines or by imprisonment of parents who do not send their children to school as it directs, and creates a new officer with a liberal salary, whose duty it is to see that its provisions are carried out. The ostensible object of this law, and one that it is well calculated to realize, is the securing to every healthy child between the ages of eight and sixteen years, a good serviceable education in the branches of knowledge usually taught in the common schools. Another laudable object that is kept well on the surface is that of bringing the children of the pauper, ignorant and vicious parents from under the sole influence of the associates and the association they are brought up among.

Children between twelve and fourteen may be employed if they show a certificate of having attended school eighty consecutive days in the current school year. Children between fourteen and sixteen must go to school the full eight months if they are not employed. A truant school is established for the education of incorrigible absentees from the district school.

A law requiring parents and guardians to send children to school a certain proportion of every year during a period of their childhood can have no effects other than beneficial ones. We have a compulsory education law in this province, and reports are sub-

mitted by teachers every year, showing how many of their pupils and how many of the children in their section between the ages of seven and twelve years do not attend school the required number of days. But no further notice is taken of the law, and virtually it is a dead letter.

There is no need for children in this province to grow up in illiteracy unless their earnings are actually necessary for their own and their family's maintenance. Nearly every child is having an education paid for, whether the benefits of an education are being paid for or not. A compulsory education law ought to be compulsory in effect as well as in intent. Where it would operate harshly, as in the case of newsboys and children who are helpful at home, partial-day attendance could be substituted for full-day attendance.—*Toronto Mail*.

#### Curious Facts.

Canada has one million miles of unexplored territory.

The normal temperature of a human body is 98½ degrees.

England has won eighty-two per cent. of the wars she has engaged in.

Over eight thousand varieties of postal cards have been issued in the world within thirty-five years.

In the British Museum, according to the catalogues just issued, there are 2,700 complete Bibles in all languages.

The metals which have been proved to exist in the sun are iron, sodium, nickel, copper, zinc, and marium.

Artificial wood for furniture, roofs, insulators, etc., is now made by burning magnesite, together with wood, shavings, sawdust, cotton, hair, or wool.

A ton of steel made up into hair springs when in watches, is worth more than twelve and one-half times the value of the same weight in pure gold.

The longest continued cataleptic sleep known to science was reported from Germany in 1892, the patient having remained absolutely unconscious for four and a half months.

Some very ancient books are to be found in the sacred relics at Ceylon. They are formed of palm leaves, written upon with a metal pen, and are bound merely by a silken string.

More than forty-one per cent of the English people could not write their names when Victoria ascended the throne. The proportion in that condition has now been reduced to seven per cent.



### A Rational Education.

Our education reflects not only the living *Zeitgeist*, but also and even more clearly, the dead standards of a long past.

The extent of our failure can be realized when we remember that nearly all educational reforms have been forced upon the schools from without. They originated with men and women who were so fortunate as to escape the pedagogical blight. When we remember that the men of mark in the great world of action and creative thought have either been educated in an irregular fashion, or if they have gone to the colleges and academies, have never taken the courses too seriously; these facts are significant. They mean that education has too often been a thwarting of the spirit, and an attempt to fit a square plug into a round hole, a pressure, a dead weight, rather than an unfolding. They mean that education has seldom, in practice at least, been reduced to a science.

I often stand in our crowded school rooms with the feeling that we have provided an atmosphere rich in the materials of knowledge—possibly over rich—but that we have not seen to the root of the matter in trying to meliorate the life conditions of the child; and particularly that there is lacking the needed sunshine of a joyous, wholesome spirit to assimilate this food, and turn it into healthful growth.—*Principal Henderson, Man. Tr. Sch., Phil., Pa.*

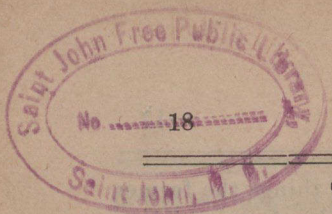
### Common Schools and the Farmers.

Mr. E. P. Powell publishes in the *New England Magazine* a protest against the failure of country schools to fit boys for intelligent farm life. He suggests important changes in the instruction given in these schools. "That part of the boy's education which consisted of skilful handling of scythe and axe and other tools is useless and vacated. So far as the three Rs are concerned, they can mostly be taught at home. What we want of our country schools is to make the farming to-day intelligent, interesting and profitable. The boys and girls should first of all be taught the composition of the rocks and soils with which they have to deal. This should be complemented with a good knowledge of plants and animal life. I suppose that no one could be more ignorant of these things than the average farmer. He is in no case taught in the common schools the structure of the animals he employs or the grains that he eats. Geography gives a knowledge of the surface of the earth in general; it points away from the farm. Geology gives a knowledge of the earth underfoot, the farmer's own immediate property; it makes every grain of sand and every granule of clay interesting;

it opens the eyes to ten thousand things the farmer must daily touch and see. Yet the farm children have geography and not geology. No one surely would condemn geography, no one would shut in or circumscribe the farmer's interests; but I plead for the other. Geology I would follow with biology in its forms of zoology and botany, entomology and ornithology; that is, I insist that our country schools shall undertake to make farmers. The boy on the farm—and the girl quite as much—needs to know the things under his feet and over his head, the soil, the life in and on the soil, and its relation to them. He should understand a cow and a horse in the zoological relations, and to some extent anatomically. I am considering the broadening out of farm life, and the awakening of interest in those things that make a part of the farmer's daily life. As the schools are, whatever is taught points to the store and the city, and not to the farm. A college professor said to me: We can do very little in the way of putting more science into the college curriculum until the high schools are revolutionized, and that requires a preliminary change in the common schools." Before the age of seven or eight, in well-to-do families where kindergartens are impossible, the child should be taught chiefly to observe. He should learn to see well and to use all his senses. After that age books should be used as aids to observation: not to dispense with original observation; but to assist. Every child should become an investigator. When this change is made, and the curriculum is re-adjusted as suggested, I do not say that you cannot drive our boys away from the farms into trade and manufacture; but I do say that, unless a lad is born with a particular bias for something else, he will love the land so that he will not wish to leave. These words are well worthy the consideration of our board of education, and every one interested in the prosperity of this farming province.—*Eastern Chronicle.*

The teacher who would succeed in his profession must study his pupils—not casually and *en masse*, as has been the practice in the past, but individually and scientifically. He must make himself thoroughly acquainted with their several capabilities, physical, mental and moral. Note in the most accurate and objective way, any salient act or remark of a child, and enter it in a register. A sound physical constitution is of the first importance to pupils who wish to do themselves and their teachers credit. If science can point the way to bodily health under the pressure which now prevails, it would confer lasting benefits on mankind.—*Selected.*





Thoughts from Rein.

Only that should be subject-matter of instruction which is able to awaken and chain the interest of the scholars. Only such material should be chosen as must necessarily awaken a spontaneous, permanent interest in every child of normal mental endowments. The interest only has a real value for education when it arises spontaneously in the pupil, accompanies him through his school life as a permanent mental activity, and still inspires him after his school year as a vital power that will always augment.

Plans of instruction are constantly being created by the mere artless collection of the series of materials; curricula are constantly being prepared in which the matter to be treated is considered, but not the question as to what material will be co-ordinated in the application of the plan, or how they may be connected. A sort of educational atomism is apparent here, which has taken hold of the work of instruction, and thinks it can produce an organic structure by the mere accumulation and piling up of material—a living being by the mere mechanical co-ordination of forces.

None of the branches of instruction can be regarded as a universal means, the intense pursuit of which could develop the formal power for mastering all other series of material. On the contrary, they should all be taken equally into consideration if the genuine many-sidedness of interest is to be obtained.

QUESTION DEPARTMENT.

(1) Miss F.—Two straight lines are drawn to the base of a triangle from the vertex, one bisecting the vertical angle and the other bisecting the base. Prove that the latter is the greater of the two lines.

Let ABC be the given triangle and BC be the base. If the side AB be equal to AC, then the line bisecting the base will coincide with the line bisecting the angle BAC.

Let AC be greater than AB. Then let E be the middle point of the base, and let the line AD bisect the angle BAC, then the point D on the line BC will be between B and E. Make AF equal AB; join the points D and F. Then the angle ADB equal angle ADF, and DF equal BD (I 4). But angle DFC is greater than angle ADF (I 16), and angle ADB is greater than angle DCF (I 16). Therefore angle ADF is greater than the angle DCF, therefore the angle DFC is still greater than the angle DCF, therefore the angle DFC is still greater than the angle DCF. Therefore DC is greater than DF (I 18), therefore DC is greater than BD, therefore the point D lies between the points B and E.

Now the angle ADB is greater than the angle AED, therefore ADF is greater than the angle AED, therefore the angle ADE is still greater than the angle AED, therefore AE is greater than AD.

(2) If two straight lines be perpendicular to two other straight lines, each to each, the first pair make the same angles with one another as the second.

Let AB and CB form a right angle at B, and DE and EF form a right angle at E, then the angle formed at H by AB and DE will be equal to the angle formed at G by BC and FE. Because the angles at B and E are right angles, therefore the angles BHE and BGE are together equal to two right angles, but the angles BGE and BGK are equal to two right angles, therefore the angle BHE is equal to the angle BGK.

(3) If two exterior angles of a triangle be bisected by straight lines, which meet in O, prove that the perpendicular from O on the sides, or the sides produced, of the triangle are equal.

Let ABC be a triangle, of which the sides BA and BC are produced, and let OA, OC, the bisectors of the exterior angles, meet in O. Draw OD, OE, OF perpendiculars to BA, BC, CA, or to these produced. Then because the angle DAO equal the angle FAO, and the angle ADO is equal to the angle AFO, and AO is common, therefore OD equal OF; and because the angle OCE equal the angle OCF, and the angle OEC equal the angle OFC, and OC is common; therefore OF equal OE.

L. J. N.—(1) Hamblin Smith, page 101. Ex. VI, 3.

If the \$1.15 had been spent there would have remained  $\$(2.609 - 1.15) = \$\left(\frac{2583}{990} - \frac{114}{99}\right) = \frac{1443}{990} =$  the first remainder  $-\frac{960}{1441}$  of the first remainder =  $\frac{481}{1441}$  of the first remainder.

Therefore the first remainder =  $\frac{1441 \times 1443}{481 \times 990}$

If he had not spent the  $\$2\frac{1}{2}$  the first remainder would have been  $\frac{1441 \times 1443}{481 \times 990} + \frac{5}{2} =$  the whole of his money  $-\frac{72}{90}$  of this money = the whole  $-\frac{1}{3}$  of his money.  $\therefore$  the whole =  $\frac{5 \times 1441 \times 1483}{481 \times 990} + \frac{5 \times 5}{2} = 34\frac{1}{2}$ .

(2) For Ex VI, 4, on same page, see REVIEW for May, 1894.

FOR MISS F. M. R., Church St.—(1) One hundred pounds of pork is divided between two men, each paying \$4.00. The man who has the hind quarter pays one cent per pound



more than the other. How many pounds did each man get and at how much per pound?

Let  $x$  = lbs. in hind quarter.

$100 - x$  = " fore "

$y$  = cost per lb. of fore quarter.

$y + 1$  = " " hind "

Then  $xy + x = 400$  cents.

$100y - xy = 400$  cents.

From (1)  $x = \frac{400}{y+1}$  (3)

From (2)  $x = \frac{100y - 400}{y}$  (4)

Equating (4) and (3),  $\frac{400}{y+1} = \frac{100y - 400}{y}$

$400y = 100y^2 - 300y - 400$

$y^2 - 7y = 4$ .

$y = \frac{1}{2}\sqrt{65} + 3\frac{1}{2} = \frac{1}{2}(\sqrt{65} + 7)$ , or 7.56 nearly.

$\therefore$  lbs. in fore quarter =  $\frac{400}{\frac{1}{2}(\sqrt{65} + 7)}$  or 53.27 nearly.

" hind " =  $\frac{400}{\frac{1}{2}(\sqrt{65} + 9)}$  " 46.73 "

Price per lb. fore quarter  $\frac{1}{2}(\sqrt{65} + 7)$  or 7.56 cts. "

" " hind "  $\frac{1}{2}(\sqrt{65} + 9)$  or 8.56 " "

(2). If 12 oxen eat  $3\frac{1}{3}$  acres of grass in four weeks, and 21 oxen eat ten acres in 9 weeks, how many oxen would it require to eat 24 acres in 13 weeks?—the grass growing uniformly.

If 12 oxen eat  $3\frac{1}{3}$  acres, 36 oxen would eat 10 acres,  
and 21 " " " 10 "

36 oxen eat the original grass + 4 wks. growth in 4 wks.

$\therefore$  1 ox eats  $\frac{\text{the original grass} + 4 \text{ weeks' growth}}{36 \times 4}$

in one week, 21 oxen eat the original grass + 9 weeks' growth in 9 weeks,

$\therefore$  1 ox eats  $\frac{\text{the original grass} + 9 \text{ wks' growth}}{21 \times 9}$  in 1 wk,

$\therefore$   $\frac{\text{the original grass} + 9 \text{ weeks' growth}}{21 \times 9} =$

$\frac{\text{the original grass} + 4 \text{ weeks growth}}{36 \times 4}$

$\therefore 189 \times \text{original grass} + 756 \text{ weeks' growth} = 144 \times$   
 $\text{original grass} + 1296 \text{ weeks' growth.}$

$\therefore$  original grass = 12 weeks' growth.

Quantity of grass on 10 acres for 18 weeks = 12 weeks' growth + 18 weeks' growth = 30 weeks' growth.

Quantity to feed one ox for 18 weeks  
 $= 18 \left( \frac{12 + 9 \text{ weeks' growth}}{21 \times 9} \right)$

$\therefore$  30 weeks' growth on 10 acres would feed  
 $\frac{30}{18 \left( \frac{12 + 9}{21 \times 9} \right)}$  oxen.

$= \frac{30 \times 21 \times 9}{18 \times 21} = 15$  oxen.

$\therefore$  30 weeks' growth on 24 acres would feed  $\left( \frac{24}{10} \times 15 \right)$   
oxen = 36 oxen.

A. C. M. L.—Can you tell me the name of this bird? Description: nearly six inches long from end of bill to end of tail. He had a white throat, yellow tufts, one on back at root of tail, one on either side where the joint in his wing, corresponding to one's wrist, touched his body when at rest, and a narrow yellow stripe on the top of his head. Think there were eight primaries, perhaps ten. His plumage was between that of the Junco and the Song Sparrow, as theirs appear on the back.

2. The scientific names of birds, etc., would be more acceptable and more generally learned if the ordinary teacher knew how to pronounce them. This difficulty would be obviated if the words were divided into syllables and accented.

3. I have been helped wonderfully by the excellent articles on "Ferndale Notes," as they have occurred from time to time in the REVIEW. I wish something more definite could be given about the sparrows, thrushes, warblers, etc., so one could easily distinguish them.

1. Your bird is the "Yellow-rumped Warbler" (*Dendroica coronata*, L.), which generally arrives in Eastern New Brunswick about the second week in May. Your specimen was seen rather earlier than the average. The generic name is derived from the Greek, *dendron*, tree, and *oikeo*, I inhabit. The specific name from the Latin *coronata*, crowned, alluding to the golden patch on its crown.

2. Latin names are more easily pronounced than English names, for Latin is spelled phonetically. A person who is not acquainted with Latin is most likely to be correct if he pronounces the words according to the general English analogy. He may in this way sometimes misplace the accent which affects the long syllable of the classics, but he will generally be right.

3. A reference to *D. coronata*, sufficient, possibly, for the identification of your specimen is made towards the end of the article in the last issue on the Goldfinch. Space will not permit in this number to give a key for the identification of all the warblers in the Atlantic Provinces.

SCHOOL AND COLLEGE.

Before the next issue of the REVIEW, the Summer School of Science will be in session in Charlottetown, P. E. Island. Many of the readers of this paper will doubtless be in attendance. Any who have not yet decided to attend should commence now to make arrangements. P. E. Island is noted as a summer resort. Besides the advantages to be gained by attending the school, there will be the benefit of a trip to the island province.

The enterprising town, Parrsboro, N. S., was educated up to a high appreciation of the value of mental culture by Mr. J. C. Craig, now Inspector of District No. 10. A new school house is to be built for the accommodation of the high school and several departments of the common schools. It will cost about \$9,000, and will be heated and ventilated by the Fuller and Warren system. This district is taking the lead in fine school houses.



Mr. A. V. Clarke who has had a short but most successful career as a teacher, has resigned his position in St. Andrews to enter upon the study of medicine. Mr. W. J. Richardson of the Moore's Mills superior school will succeed him.

Miss Susie Ganong of the St. Stephen staff, has obtained a year's leave of absence to take a course at Smith's College, Northampton, Mass.

Chief Supt. Inch visited St. John during the month to confer with the local committee regarding arrangements for the Provincial Institute. With Supt. March he visited several of the departments in the St. John schools, and in company with Inspector Carter visited the Fairville and Milford schools.

The professional examinations for license (N. B.) begin on Tuesday, June 12th. They will probably last three or four days for first-class candidates.

The departmental examinations including normal school entrance, high school leaving and university matriculation examinations, begin July 3rd. In St. John, these examinations will probably be held as before, in the Victoria School building.

Prof. Dixon of the University of N. B. was married on June first to Miss Alice Allison Harrison, only daughter of Chancellor Harrison. The REVIEW extends congratulations.

The St. John grammar school cadets will camp out this year somewhere within easy reach of St. John.

The closing exercises of the university of N. B. were held on May 31st. They were of the usual interesting character, and were attended by a large number of the graduates and friends of the institution. The address in praise of the founder was given by Prof. Dixon of the faculty. Mr. A. B. Maggs delivered the valedictory of the graduating class, and the Hon. C. N. Skinner of St. John, the alumni oration. The graduating class was quite large this year. The Douglas gold medal was won by Miss Shaw of St. John. The alumni gold medal, by Miss Cameron. The Campbell memorial prize was won by A. B. Maggs for proficiency in classics. The Brydon-Jack memorial scholarship was awarded to Francis Allen. M. A. degrees were conferred upon Rev. L. A. Hoyt and Fred P. Yorston (ad eundem), and Rev. J. DeSoyres and Rev. Geo. Lloyd (honorary). The degree of Ph. D. was conferred upon Philip Cox and L. L. Dupon, Geo. R. Parkin, Hon. Geo. E. Foster and Prof. J. F. McCready (Toronto university).

At the meeting of the alumni society held in Fredericton, May 31st, Judge Vanwart was re-elected president of the society, and Hon. James Mitchell and Dr. Murray McLaren representatives to the senate.

Students at the Summer School of Science may have an opportunity of taking the examinations for any of these Tonic Sol-fa music certificates: 1. Junior. 2. Elementary. 3. Intermediate. 4. School Teachers. 5. Elementary Theory. 6. Intermediate Theory. 7. First Grade Staff.

The celebrated Dr. McIntyre, of Denver, Colorado, has been engaged to deliver a course of lectures on "The Creative Week." This will be an opportunity that may not again soon occur to hear a widely-famed lecturer.

Persons purposing to attend the Summer School of Science at Charlottetown, and desiring to secure a boarding place beforehand, should correspond with the Secretary, J. D. Seaman, of Charlottetown, at once. Applications that are received before the end of June, will all be arranged for. After that date the hurry and press of work may make it impossible to give the satisfaction that would have been given earlier.

Reduced rates of travel will be made with all steamboats and railroad companies for members of the Summer School of Science. Those travelling by the I. C. R., when getting their ticket must get from the agent a certificate entitling them to free return.

Principal Miller, of Dartmouth, N. S., schools, has decided to have a system of telephones connecting all the schools of the town. Instead of venturing to ask the school commissioners, who are known to be extremely economical, for the necessary funds, he decided with the aid of his teachers to raise the money otherwise. As a beginning, he gave a public lecture on "Tombstones." The lecture was a decided success financially, as well as from a literary point of view. Principal Miller's talents in this direction, now that they are known, will be frequently called into requisition.

The *Advocate* gives an interesting account of the public terminal examination of Sydney Academy. Principal McKeen addressed the visitors giving a short outline of the history and work of the institution over which he so ably presides. There are fifty students, of whom twenty are from beyond the section, and fifteen are young ladies. Of the fifty, five expect to become clergymen; five, doctors; two lawyers; two teachers; and one is studying for the London University.

Principal McKeen complains of the operations of the one term system in reducing the number of applicants for teachers' licenses from thirty to two. It is not so easy now as formerly, to make the teaching profession a mere stepping stone to a higher education. Though the one-term system does not at the present time seem suited to the wants of Cape Breton, yet he admits that in the long run it may benefit teachers.

The former graduates of the Academy are distinguishing themselves in their various walks of life.

While the Academic work in the main follows in the lines of the course of study, yet there is special attention given to original investigation as opposed to mere book-learning.

To the Academic staff there has been added a superior art teacher. Vocal music will be taught by an associate of the Royal Tonic Sol-fa College of London. Principal McKeen is ably supported by Mr. Stewart. The high position won for the academy by Principal McKittrick, at present of Lunenburg Academy, will be fully sustained by these enthusiastic educationists.



At a meeting of the executive of the Charlotte County teachers' institute, it was decided to hold the next session in St. Andrews during the latter part of September. It is hoped that Dr. Inch will be able to be present. See programme in this number.

The superior school at Gaspercaux Forks, Queens County, N. B., has received a set of minerals from the geological department, Ottawa. There are one hundred and thirty-five specimens—very large—and the trustees have provided a fine cabinet to preserve them. This school has added twenty-four volumes to its library, which were donated by former pupils who still remember the old school.

Mr. A. H. Sherwood, who taught the superior school at Hampton, N. B. for several years with marked success, has been teaching in Everett, Washington state, for the past year. That Mr. Sherwood's services are appreciated, may be judged from the fact that his salary has been increased twice during the year.

The *Moniteur Acadien* says that a letter from Edinburgh states that Dr. J. Clarence Webster of Shediac, N. B., has won the first prize, fifty guineas, in the Royal College of Medicine for original work in scientific medicine during the year. In the ten years he has passed at Edinburgh, says the *Moniteur*, Dr. Webster has won \$4,000 in prizes.

Arrangements have been made with the P. E. I. Steamboat Co. so that all attending the Summer School of Science, travelling by their boats, can do so for *one fare*. When procuring tickets from the agent, *be sure* and get the Company's certificate, which when signed by the secretary of the school, will entitle the holder to free return.

The Royal Society at its recent meeting in Ottawa elected the following Fellows: Dr. MacCabe, Principal of the Ottawa Normal School; G. U. Hay, Principal of the Girls' High School, St. John, N. B.; and W. Hague Harrington, Ottawa, formerly of Sidney, C. B.

Teachers and students ought to read the announcement made by Messrs Kerr & Pringle, of the St. John Business College, in another column. This excellent institution has prepared a vacation course that is of the utmost importance to teachers training boys and girls for commercial life.

The marriage of Prof Duff, lately of the university of N. B. to Miss Isabella McIntosh of this year's graduating class is announced as soon to take place.

The Halifax Academy has just issued its calendar for 1893-94. It is a neat little pamphlet of 32 pages. Among other items of interest it reports 700 volumes in the library. The manual training department is described. There are three gold medals, three silver medals, and two bronze medals offered for 1894. The names of 142 out of 156 applicants who won government certificates are given. Four of these received grade "A" and twenty-nine grade "B." There are in attendance this year 253. Of these eleven are in grade "A" and eighty in grade "B."

Professor Murray having accepted a Professorship in Dalhousie University, leaves a vacancy in the Academy which it will be difficult or impossible to fill.

The annual meeting of the Queen's and Sunbury (N. B.) Teachers' Institute was held in the grammar school, Gagetown, Thursday and Friday, May 31st and June 1st. Inspector Bridges was present, and took an active interest in the proceedings. The following papers were read: School Discipline, by Harrison H. Bridges; First Steps in Composition, by Miss F. J. Rosborough; Kindness to Animals, by R. W. Demmons; Methods in Arithmetic, by Miss Annie L. Briggs; Grammar, by B. H. Webb. A practical lesson was given to a class of six girls of Standard IV on English Composition, by Miss Annie E. Weston.

F. G. Berton, B. A., was elected president and Miss F. Janet Rosborough, of Maugerville, vice-president. Additional members of executive B. H. Webb and Miss Annie L. Briggs.

Principal Torrey, of Springhill, N. S., with the aid of his assistant teachers planned and carried to a successful issue a combined concert, art show, and conversazione. *The Springhill News* writes in the highest praise of the various performances, and of the art exhibited as being the best ever seen in Cumberland. The net sum realized exceeded \$90, which pays for a beautiful new flag for the high school, besides leaving a considerable sum to purchase books for the school library. To have accomplished these worthy objects must be gratifying to all concerned. But still more satisfactory is the fact that the youthful performers did their part so well.

In his efforts to raise \$300 to pay for a system of private telephones connecting him with all the schools under his charge and with the school board office, Principal Miller, of Dartmouth, N. S., set a good example to his pupils in beginning with a lecture. They followed up his efforts by giving a concert on the 31st of May, which drew such an audience that it had to be repeated next evening. If it is the correct things for the gods to help those who help themselves, the school board can scarcely do less than offer to make up the small balance still needed. They will then have the honor of being the first in these provinces in introducing the telephones into the schools, as they have been the first in adopting the school savings banks, and a regular kindergarten.

Miss Bessie Howard, well and favorably known as one of Charlotte Co's most successful teachers has accepted a position in British Columbia.

The closing exercises at Acadia University took place June 6th. The friends of the institution were present in large numbers. The degree of B. A. was conferred on 22 graduates, of whom four were young ladies, the largest graduating class this year, except that of Dalhousie, which graduated 27. The following degrees were also conferred: Master of arts in course—A. T. Kempton, Wm. Hitchins, Zenas Fash, H. Y. Corey, F. H. Beals, Geo. A. Chipman, Rev. W. B. Hutchinson, A. C. Kempton, J. L. Masters, Rev. W. Tingley, Rev. R. O. Morse, Rev. H. F. Waring, Misses Mamie Lean, J. M. McLean and M. B. Bishop. Honorary master of arts—G. U. Hay and Rev. J. A. Gordon; Doctor of Philosophy—Prof. J. A. Eaton; Doctor of Divinity—D. A. Steele, G. M. W. Carey, S. B. Kempton.

The convocation of Mt. Allison University took place the last of May and the first days of June. The proceedings were of great interest. The graduating class numbered sixteen, of whom four were young ladies. The valedictorian was Miss H. S. Olive, of St. John. There is every encouragement to the friends of Mt. Allison in the work of the past year. The corner stone of the new Art building was laid, and the fine building, intended as a residence for students, is approaching completion.



## BOOK REVIEWS.

THE SCHOOL-ROOM GUIDE to Methods of Teaching, by E. V. DeGraff, A. M.; pp. 396. Published by C. W. Barden, Syracuse, N. Y. The fact that this is the eleventh edition of Mr. DeGraff's School-room Guide is sufficient evidence that it meets a want. In this edition entire chapters have been rewritten, and an entirely new set of plates prepared.

A CLASS IN GEOMETRY, by Geo. Iles; pp. 46; Price 30 cents. ELEMENTARY PSYCHOLOGY, by Amos M. Kellogg; pp. 50; price 25 cents. Publishers, E. L. Kellogg & Co., N. Y. The first of these cannot fail to give the teacher of geometry new ideas, and the second will give those who have not access to larger works an excellent compendium on this important subject.

DER RITTMESTER VON ALT-ROSEN (the Captain of the Old Rosen-Regiment), by Gustav Freytag, edited by James Taft Hatfield, Ph D.; pp. 200; price 75c. Publishers, D C Heath & Co., Boston. This is a well arranged and well printed book in Heath's Modern Language Series. In it we are transported into the days of Germany's deepest distress and humiliation, when the devastation of thirty years' disorder, violence and cruelty almost annihilated the results of thirty generations of culture. The work presents a graphic picture of French influence with the dawn of a new order of things, which eventually restores vigor and efficiency to Germany's exhausted forces.

SUPPLEMENTARY WORK IN ARITHMETIC. Part I, Lines; Part II, Area; Part III, Volume and Bulk; Part IV, Percentage. By Wm. M. Griffin, A. M., Chicago. A. Flanagan, publisher. The study of lines, as the author truly says, too often consists in simply learning the tables. This work by Mr. Griffin, of the Cook Co. Normal School, is full of suggestions and problems, logically arranged, and will prove a great help to teachers.

RATIONAL MEMORY TRAINING, by B. F. Austin, A. M., Principal of Alma Ladies' College, St. Thomas, Ont.; pp. 124. The value and importance of good memory is set forth, some account of phenomenal memories is given, and

some of the physiological conditions of memory stated. The importance of daily exercises of the memory, as the rational method of strengthening it, is urged upon the student.

OUTLINES OF HERBART'S PEDAGOGICS, by Ossian H. Lang; pp. 72. Publishers, E. L. Kellogg & Co., New York and Chicago. In this work are set forth, briefly, yet clearly, the fundamental ideas of Herbart's educational theory. Teachers desiring to teach in the light of modern pedagogics will find this book a stimulus.

THEORY AND PRACTICE OF TEACHING, by David P. Page; pp. 324. Publishers, A. Flanagan, Chicago. Page's work has been too long before the educational world and its worth conceded to need any lengthened review. This edition, besides the original work by Mr. Page, contains a valuable summary of his life and teachings by William F. Phelps, A. M.

## The June Magazines.

In the *Popular Science Monthly* for June there is an article by Jas. L. Hughes, of Toronto, on "The Kindergarten a Natural System of Education." In it there are many educational truisms, as "Knowledge has no value except as it is used;" "The kindergarten trains the executive powers of children;" "In the true kindergarten no woman can find a place whose heart is not young, whose life is not pure, and whose aims are not unselfish."... In the *Atlantic Monthly* there is an excellent article on "The Scope of the Normal School," in which the conclusion is reached that "it is only a matter of time when it (the normal school) shall attain its ideal,—that of purely professional instruction in the preparation of teachers for the elementary schools.... A writer in the *June Century* questions the wisdom or experience of military drill in schools. There is a good article in the same number on "The Reform of Secondary Education.... In the *June Forum*, Pres. G. Stanley Hall reviews the scholarships and fellowships and other such advantages that are given to encourage the highest learning in England, in Germany, and at all high-grade American institutions.

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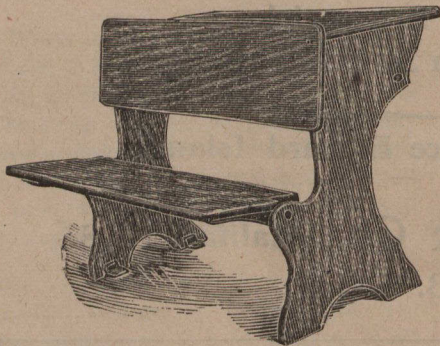
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