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THE CANADA

# EDUCATIONAL MONTHLY

NOVEMBER, 1898.

## SUPERINTENDENT GREENWOOD'S ANNUAL ADDRESS.

THE education provided for the child by the state is limited to months, days, and hours, and these again by so many hours a day and so many days of the week for each year. The maximum number of weeks not to exceed forty, the hours of the day not to exceed seven—so that, out of the one hundred and sixty-eight hours a week, the child does not come directly under the teacher's control more than thirty-five hours, and possibly as few as twenty hours. Again, between the spring and fall session there is always an interval of from twelve to sixteen weeks when the child does not attend school, but is supposed to be resting and building up his bodily strength for the next school year. This condition faces one of the unsolved problems—what to do with the city and town children during vacation? Shall their vacation games and amusements be supervised, or partly supervised, or shall they be turned loose to enjoy themselves as best they may—on the streets, in the alleys, and on vacant lots? To put this question in another way, has the public a duty to perform for the children when they are not in school? Would it be a violation of the home relations between parent and child, if the state should exercise a healthful supervision a part of the time over its children during the long heated term? There are children, it must be admitted, who have to work during

the summer months, but from a sanitary standpoint they, too, need attention and the state now regulates the hours as well as inspects the conditions under which child labor is employed.

The schools can do only a part of the work towards educating the child, and that a minor part under the most favorable conditions. The faculty to play is instinctive among children, as it also is among the young of the inferior animals, and play is the spontaneous way that the child has to express himself most naturally. We observe this tendency among children in a thousand forms in their games and antics. If they are pent up in a small space or room, they tease and torment one another, and appeals are continually made to have a supervisor interfere to make some one behave. In such a situation the vicious and selfish propensities are most fully and freely developed, and the seeds of envy, jealousy and malignity sink their roots down deep into the child's nature. To tell children to sit still and be good, and to enforce the command, is often worse than some of the deadening processes occasionally practised in a few well-ordered schools. To repress childhood is not to understand the nature of children; and, in making this statement, it is not to be inferred that the child is not to learn the lessons of obedience, silence and industry at the proper time.

The street influence, unbridled, is about the worst possible school of instruction the child can enter. Curiosity is a predominant trait of childhood, and only let a policeman's whistle blow, or a drunken man pass along the street, and the children come trooping to the scene in swarms. As soon as the child is large enough to open the gate and rush into the street, he enters into a school in which all the vicious traits of a depraved character are fostered. A species of demoralization and terror is practised by larger boys on the smaller that can find its counterpart only in the misrule which the dominant class in some nations practise, as extortion on the dependent and helpless class whom they govern. Street gangs are formed—veritable Ishmaelites—whose hands are against everyone and everyone's hands against them. They tease, torment and annoy the citizens; they steal from other children, snatch fruit and vegetables from the grocery stores, defy the police and insult girls—doing many of these things because they think it is funny. Under such tuition they develop a low, quick species of cunning, but it is acquired at the expense of arrested development along higher and better lines of growth. It is only a step from the street and alley associations to crime and wretchedness in their more pronounced forms. Out of this class is recruited that element which stands as a constant menace to good citizenship in the city. I believe that the chief cause—if not the very root of this demoralization—is traceable to inadequate playing facilities for the children. It is owing to misdirected energy, and this brings along in its train a long list of evils which dwarf and blight the child's moral, physical and spiritual growth, unless such a one as *Oliver Twist* be found now and then, able to withstand all adverse conditions of environment and rise triumphant over all.

A good playground is as necessary to a child's growth, health, happiness, culture and general intelligence as any other necessary condition of its existence. By furnishing such conditions the child is given an opportunity to strengthen his character in every direction by giving him cheerfulness, freedom, and contentment, repressing the evil tendencies, choking them out, as it were, and giving the better side of his nature a chance to expand and grow into that firmness of habit known as good character. That such playgrounds are needed in almost every city, no one will have the hardihood to deny. There should not be little spots of ground here and there where the children must be good and quiet and not make a noise. They ought to be large enough for the children to play on, a hundred or a thousand at once. They should not be baseball grounds and nothing more, but real playgrounds on which the games are regulated to suit the time of the year and the hours of the day.

For several years the feeling has spread among a large class of the people of this country that the schools should give much more attention to what are called "common things," and it is well known that the expression "common things" may be made to do drudgery for all conceivable occupations in which persons are engaged. It is evidently true, too, that what may be regarded as very common things in one line of work may be entirely unknown in other fields of activity. But the restrictive use in which "common things" is employed in an educational sense, limits the meaning to within a narrow compass—embracing some knowledge of natural objects of an organic and inorganic nature; but more particularly of plants, animals, soils, the atmosphere and its conditions—in short, nature studies.

Each trade brings one into relationship with certain conditions which

must be mastered and understood to some extent. No doubt the chief impetus given to this kind of work, in addition to regular book learning, was owing to imported knowledge carried by certain teachers into school fresh from the farm, the workshop, the desk, and the laboratory. Among country children many things that they know and are familiar with need not be discussed in the country schools—but with city and town children this knowledge is a novel and an important acquisition from the fact that it is not common. Planting, growing, cultivation, harvest, and gathering in the crops—these are everyday affairs, and excite no great interest among children in the country; so the return of the migratory birds, the fishes in the streams, and the appearance of insect life, and all the manifestations of growth, maturity, and decay observed in the changing scenes of rural life, are matters of common occurrence. Besides this, the country child becomes, in one sense, “weather wise.” The very nature of the occupation in which his parents are engaged causes him to become a close observer of atmospheric conditions, and he learns to read these signs with as much facility and accuracy as he interprets her passing thoughts from his mother’s face. He absorbs the workings of nature with hardly an effort, and whenever something new or unusual attracts his attention he inquires of those older than himself for the reason. Of city or town life he knows little. He has not learned much of the strength of combination, or of how business is conducted, and in this respect he is far behind his city cousin. The difference is in the surroundings and the opportunities, and not in natural aptitude. A little levelling up would help both, no doubt, and this is the opportunity for the progressive teacher to import the child from one phase of life to another.

To induct the city children into nature study on a small scale would not be a great task, and yet it would afford genuine pleasure as well as valuable information. It may be done in the following manner in many schools. Let there be set aside a plot of ground at the schoolhouse upon which vegetables, cereals, etc., are planted. Let the boys and girls, who are interested in these things, prepare the ground, procure the seed, and do the planting and the cultivating, to see the plant start from the seed and produce its kind. All the children then would become familiar with growing crops. A part of this plot should be laid off into flower beds. If such a piece of ground could thus be cultivated at each school wherever practicable, the city and town children would become tolerably well acquainted with agricultural and horticultural industry on a small scale. The ideal school, I should say in passing, with its walks, flower beds, shade trees, and little patches of grains and grasses, and properly equipped inside as well as outside, is what the teachers of this state should strive for. And, to go a step further in this direction, at the country schoolhouses there should be two or three acres of land for experimental purposes—on which the teacher and the pupils could experiment with all kinds of fruits, grains, vegetables, flowers, and ornamental shade trees. This is not an impracticable scheme, but one which lies clearly within the reach of every neighborhood having a schoolhouse.

Another phase of nature study which may be taught incidentally is that of the weather; and this is a subject that is very closely allied with the study of geography, and the animal and vegetable products of a country. The temperature, the moisture or the dryness of the atmosphere, the direction of the wind and its velocity, the amount of rainfall or of snowfall, the cloudiness

and the kinds of movements of the clouds—these and many other daily phenomena are of such a nature as to attract and interest the attention of children, whether they reside in city or country. In addition to the small thermometers now supplied in each schoolroom, there should be a barometer at each building, and the pupils should be taught how to read it and to make records of the weather daily. There is no reason why the children should not become entirely familiar with these common objects of nature, and learn how to interpret them as they do other daily phenomena. It would furnish a basis for more extended observations, and would be carried forward as a means of establishing a rational and systematic method of arranging and classifying many of the leading facts concerning the atmosphere, the weather, its changes, and some of the laws underlying the subject of meteorology and its influence on men and crops generally.

This knowledge may furnish the explanation of what is known as "noisy and restless days in school."

Some things are accomplished by accident, but the habit of easy, rapid and accurate writing or speaking the English language is not one of them. It is a self-evident fact that wide differences exist among individuals as to the natural ability to acquire and to use the art of written or vocal expression, just as there are variations in the power to acquire other kinds of knowledge.

So far as instruction in this department of education is concerned, perhaps the unsatisfactory results may be ascribed, in a large measure, to the indefinite aims that the majority of teachers have in mind, or rather not in mind, in conducting pupils forward in this line of work. The usual method of procedure has been that of absorption or contamination by words and

sentences. That is to say, certain authors are read, analyzed, and reduced to the saturation point, so that unconsciously the learner is filled with their effluvia, and he lives and breathes a literary atmosphere till it literally fills his word, sentence, and paragraph-brain-cells, and all that he has to do when he needs to use this pent-up energy is to turn the composition tap, and let it flow out through cold ink on white paper, or to toss it out into the air to vibrate as a shiver around the world. Close reflection will convince anyone that this theory of making a style is largely imitative, and the effort of a writer trained under such a system of tuition will be put forth to counterfeit his style so as to avoid detection. I would not be understood as condemning the advantages that come to one from studying the classic authors of ancient and modern times, or of preferring some authors to others, because such studies are invaluable as revealing the structure and logical development of the human mind when working under the highest degree of intellectual inspiration; but what I do contend for is that the imitative standard is not the highest, nor, indeed, is it the best, for the learner. The style of each one is his own, and it should be as far removed from the imitative one as possible, and the sooner this fact is recognized and acted upon the better will teaching in English become.

A second element of weakness, as I conceive it to be, is in the vagueness of the objects aimed at. If I can succeed in making my meaning clear on this point, one great step will have been taken.

First, there are certain mechanical conditions that have to be complied with, such as the ability to write a clear, legible hand; to know how to spell correctly all the words used; to use capital letters properly, and to punctuate correctly, and to know when a sentence ends, and where a para-

graph begins and closes. The learner cannot acquire and retain this knowledge without becoming familiar with grammatical forms, and some standards of accuracy and clearness in the use of his mother tongue. His habits of thought will give him the idea of clearness in the orderly arrangement of his sentences in paragraphs, and why one order in sentences arrangement is preferable to another. The arrangement of words in sentence will reveal to him the necessity for an extensive and varied vocabulary. All of this presupposes some reading in order to fix the points in didactic instruction.

The point that I insist upon is this—the teacher of English who has a cut-and-dried scheme, whatever grade the pupils may be, can never reach the best results. There should be no prescribed form except in the mechanical requirements mentioned. To follow models is to violate every instinct in nature by an attempt to level what no process, however great the pressure, can ever accomplish. The aim should be to get each pupil to express himself in his own way in the very choicest language possible. This should be the spirit and aim of all successful teaching. There must be instilled into the learner's mind the ambition to express himself well and in his own way, but his way should be such a one as embodies correctness, neatness, clearness and elegance. For the cultivation of exact expression, I know of no other species of composition equal to the written solution of a problem in arithmetic or algebra, ready to put into print. This develops logical consecutiveness,—each step in its proper place. The same exactness of arrangement in the treatment of other simple subjects will give the pupil a good idea of what is meant by logical unity in the unfolding of a subject. This appeals at once to the analytical faculty, and then it gives scope after

the analytical faculty has done its work for the imagination to embellish and adorn the facts in accordance with the canons of taste. Subjects that interest are generally the best to be assigned for composition, and it may be better not to give the same subject to all the members of the class. All slovenly, hasty writing in ward schools or high schools, just to answer questions or to take notes, can not be too strongly censured.

The idea that English is not to be taught except by those who are assigned to teach it, is one of those strange species of mental hallucinations that has its explanation in a clear misconception of the use and nature of our language. All instructions in our schools should tend in the same direction, and should not be running in cross currents.

No effort should be made to encourage learned writing in either ward or high school. The spontaneous effort—outburst of each one's individuality—is what should be aimed at. In due time the fine writing will take care of itself. Let the pupil be impressed with this solemn fact that if his writing gets into print, and it is not able to stand the tests of scholarship, it reacts upon him. Then he will most likely work to produce such writing as will reflect credit upon himself. The final rule upon which stress should be placed is that each one does his best every time he writes.

There is more unrest manifested in the present methods of teaching geography than in any other subject included in the common school curriculum. This change has been produced chiefly by a different conception as to the real issues involved in the subject matter and what factors are of the most importance to man with his fellow-man as exchangers of products—whether of the raw material or of manufactured articles. Under the old definition, geography was literally

a description of the earth's surface, but this definition is entirely too small for even a workable hypothesis at the present advanced stage of national intercourse. Even supplementing the definition by "what grows on its surface," it is still too narrow.

Instead of attacking the subject from the descriptive side and the mathematical side, and working out the political, it should commence with what the child can see, in his own immediate vicinity, of soil, hills, valley, plains, etc., and such plants as are produced in the garden, orchard, farm, or such articles as are manufactured in his own community, and such other raw or manufactured products as are brought within the range of his observation. Just enough of the physical and mathematical phrases of geography should be at first introduced as will familiarize the learner with the technical terms of the science. What is here intended is designed to open up, in the very earliest stage of the learner's progress, what may be gained from a knowledge of all those articles of household consumption found in our grocery and dry goods stores, and how they are brought from one place to another. The time has come when the great cities of the world are the real geographical centers, and they afford the basis for an intelligent investigation of the subject.

The sooner the conception spreads among our teachers that we are interested most in what a people produce and what they have to exchange with other people, and how trade is carried on between them and our merchants, the more nearly we approach this subject in an intelligent and instructive manner. Pertinent questions will be—what do they produce in that country, and how much of their trade do we need and how much do we get? Then, what do we produce that they want? Do we trade with them direct or through another nation? These

questions apply to foreign commerce, but they can be used with as much precision for domestic commerce. From those rudimentary beginnings, following the channels of commerce, the pupil is led out into all parts of the habitable globe. Wherever our ships and railroads go, he goes and can see the reasons therefor. He learns, furthermore, how to study the manners, the customs, the political institutions, and the various occupations in which the most of the people are engaged. Rivers, mountains, lakes, bays, straits, channels, sounds, and harbors are only serviceable to man in proportion as they can be used by him or as they influence climate, health, and trade; otherwise, they cut no figure in the affairs of the world. It is all well enough to talk about the undeveloped wealth of a country, but that amounts to little unless there are people who are bringing these treasures to man's use. Man, then, is the real factor involved, and not man as an isolated being—a Robinson Crusoe—but the trafficking, intelligent being is he who brings distant markets close enough together to exchange products.

So pressing has this kind of knowledge become that among the most advanced nations of Europe they have been forced to found and endow special schools for the purpose of furthering trade with distant countries. Such a movement should be inaugurated without delay in this country. The necessity is pressing now since we have opened a new chapter in the world's history, and will be henceforth one of the final arbiters in the progress of civilization. The battle of the nations is for the trade of the world. Experience has shown that trade is governed largely by well-established laws, and that these laws and principles can be applied with a tolerable degree of certainty to any set of industrial conditions. To use an illustration that is familiar to all of you,

the wholesale firms in Kansas City send out their travelling men to solicit trade over a wide extent of territory. Should they not do so, other centres would come in and occupy the territory, and get the trade. It pays to send men into cities and towns who know what the local merchants want for their customers. Now, upon a much larger scale, is, practically, what the Germans, the French, the Hollanders, and the English are doing, or are getting ready to do, with all the more distant commercial peoples of the world.

The Americans must become now a modern language-learning people. It is a necessity if we wish to command a large part of the trade of the world among people who do not speak our language.

What I have so hastily sketched on this subject is an indication of what must be brought into our courses of instruction, leaving the further extension of the work to boards of trade and commercial clubs in the business centres of the United States.

#### A WORD TO THE TEACHERS.

The greatest danger the teacher has to guard against is the misdirection of energy on the part of the pupils. It is now stated on good authority that sixty-four persons are engaged in making a single pair of shoes, and, if one should drop out, the shoes remain unfinished, so far has the sub-division of labor been carried. In teaching, we reverse this by having one teacher watch over the most complicated relations requiring the very clearest perceptions of the rights, duties, and necessities of a house full of children, in which a delicate conscience and a keen sense of justice are called into exercise every hour of the day. Nowhere else is the power of organized effort more fully displayed, and is made to serve a better purpose, the enor-

mous power of teacher and class is focalized on simple points, and illumined and mastered in detail.

A rapid survey convinces the true teacher that ignorance, vice, and wretchedness exist among some classes of the community, and over against these are to be set their opposites, intelligence, good character, sobriety, culture, refinement, and comfort. The contrast is sharp and strong. The former constitute social dynamite, and the latter lead to obedience of law and good citizenship. The main object is to teach the children how to live and how to get the most permanent happiness out of life. How to use life and how to enjoy all its beneficent privileges is the main work of the school. The uplift should always over-balance the down pull.

A courageous teacher is needed to take hold and discipline and instruct children, if the instruction is to last through all time. To be opened-eyed, open-eared, and tireless, are qualities accompanying the real teaching spirit. It is marked by the courage of convictions. It signifies that the teacher is brave enough to be understood and misrepresented—ridiculed, abused, but can afford to wait for time to vindicate both work and motives. All this demands intelligence, will-power or determination, executive ability to carry forward in the best way the work that should be done.

Let it be summed up in the very briefest compass—by saying it demands what is reasonable and necessary.

Preparation in advance is always half the battle, and this brings us back to a safe principle in school management—that is—no school is well managed unless all the work is well planned. Some plans are not worth anything. Teachers, submit your plans to your principal. There is safety in a multitude of counsel. As teachers



we see clearly that the children's physical, moral and intellectual well-being are entrusted to us part of the time. This trust we cannot evade if we would, and we should not if we could. Their relations and ours are bound up in one bundle. Education becomes a progressive movement, and no live teacher can afford to break ranks and fall out. Those that do so should ask for a discharge.

A school is measured by the character, the life and the working and the obedient spirit that fill it with energy and enthusiasm. Professor Tyndall hated the school he attended when a child, because it had no life in it.—*School and Home Education.*

## A PLEA FOR THE BETTER TEACHING OF MANNERS.

BY FLORENCE BELL.

A great deal of time is spent in these days in discussing what is the best equipment for success in life, and those of us who have the heavy responsibility of deciding important issues for another generation pass anxious hours in weighing the comparative merits of such and such branches of learning as preparation for such and such careers. But we contrive to omit completely from that deliberately formulated scheme of instruction the thing that probably matters most—namely, the manner, as well as the manners, in conjunction with which that excellent equipment is going to be used, through which it is going to be interpreted, and on which will almost certainly depend its ultimate success. However well stored your mind may be, however valuable the intellectual wares you may have to offer, it is obvious that, if when calling your fellow man's attention to them you give him a slap in the face at the same time, you will probably not succeed in enlisting his kindly interest in your further achievements. And yet we all know human beings of good parts and of sterling worth who contrive by some unfortunate peculiarity of manner to give us a moral slap in the face every time we meet them, simply because they did not receive any systematic teaching of advanced manners at a time of life when such teaching is most important. There is plenty of excellent grounding in elementary manners to be had in the nursery and the school-room. The extraordinary fertility of invention with which a child will find ever fresh ways of transgressing every human ordinance, is kept in check and corrected by those about him, who are constantly saying: "Don't do this," "Don't do that," until, insensibly guided by this hand-rail of prohibitive maxim, the child learns in a rough-and-ready way to bear himself more or less well at this stage of his passage through the world. Unfortunately, however, the more grown-up faults of manner do not generally show themselves until the offender has passed the age when they might, without loss to his dignity, fitly have been corrected. It is easy to tell a boy of twelve not to annoy other people by drumming with his feet on the floor during dinner; but it is more difficult to tell him when he is twenty not to make himself offensive by laying down the law. That difficulty of admonition increases as years go on, and it may safely be asserted that the fault of manner which is not cured at twenty-five will still be there at seventy-five. And, alas! in half a century there is time to offend a great many people. Surely it would be quite possible to obviate this danger by timely and systematic instruction. We take

a great deal of trouble to impress on a young child certain quite arbitrary rules of demeanor, which are so constantly reiterated and insisted upon that he gradually takes them as a matter of course, and obeys them automatically for the rest of his life, until it would be utterly impossible for him, arrived at manhood, so to fly in the face of his early training as to tie his table napkin round his neck at a dinner-party, to put his knife into his mouth, or to attack his gravy with a spoon. Why should it not be possible to have a course of second-grade instruction in demeanor, so to speak, which should in its turn be as thoroughly taught as the primary one, as insensibly assimilated and automatically obeyed? But it does not seem to occur to most people that this is necessary. Our usual plan, or rather want of plan, is to furnish the young with some stray, haphazard generalities, and then consider that we have done enough. There are few things more dangerous than the half-truths—necessarily and obviously half-untruths as well—which we thrust into the gaps of our code of conduct in a makeshift fashion, to the exclusion of more complete ordinances. Without a misgiving we proceed to tell young people that “manners maketh man,” or “Good manners proceed from a good heart,” and then expect that they themselves should fill in the details for their own daily guidance. We might as well tell them the formula of the law of gravitation, and then expect them never to tumble down.

And so we let them learn by experience—surely the most tedious and painful form of acquiring knowledge—at their own expense and that of others. We let them fall into one pitfall after another, and scramble out as best they may, scratching themselves and others in the process, and perhaps making enemies of dozens of their fellow-creatures who would otherwise

have been well disposed. We allow them to try by practical experiment whether it is by being pompous, off-hand or patronizing that you can make yourself the most disagreeable, and how long other people will enjoy talking to you if you are looking the while, with ill-concealed inattention, over their shoulder. And yet these are things which it is important to know, these are things which should be deliberately taught, and not left to chance.

It is a platitude to say that, as regards the average mass of human beings, the question of failure or success in life is almost entirely determined by their personality. I am not speaking of those whose transcendent gifts of any kind must inevitably lift them conspicuously above their fellows, even when accompanied by the drag of an unfortunate manner; but of the average mortal, sufficiently well equipped to carry him through successfully, provided that all the other conditions be favorable, and that he be not hindered by quite unnecessary stumbling-blocks that a little trouble and forethought might have removed from his path. An ingenuous investigator put forth, I am told, some time since a circular inquiring into the causes of failure, a copy of which was sent round to all the people who might be supposed to have good reason to know the answer. History does not say what were their feelings on receiving it. But, however plausibly they may have managed to explain why they had not succeeded in doing all they had desired to do, we may surmise that they did not, in nine cases out of ten, put their finger on the real cause—namely, that of having been afflicted with an unlucky manner, or unlucky manners, which had stood persistently in their way. They had taken, no doubt, a very great deal of trouble to learn many things that they thought would be useful to them, but this thing, that matters so very much,

they had left out altogether. Manners may not "pay"—to use that ugly expression—in an examination, perhaps. But, once that, by dint of studying history or the classics, the examination has been passed and the career entered upon, a previous study of manner and manners will be found to pay very well indeed. It may mean that the road of life is made smooth instead of rough; easy instead of difficult; that the traveller is helped along it by the encouragement of others, instead of being hindered by their dislike. Such a study, however, but rarely finds its place as part of an accepted curriculum. During the long and frequent conversations on education with which mothers are wont to beguile the time when they meet one another in society—these conversations occasionally take the form of an alternative and competitive recital of the achievements of each mother's offspring—you will hardly ever hear of manner or manners being taken into account in making educational arrangements for Sybil or Dorothy. On the contrary, you will probably discover that such branches of learning as they are pursuing are being acquired under conditions in which manners will probably be entirely overlooked. Dorothy is learning music abroad, living in a family whose absolute respectability has been carefully inquired into, but where it is not likely that there will be much observation, or much criticism, therefore, of the hundred little departures from grace of bearing into which young people are apt to slide. Sybil, who has a stronger mind, is learning the classics at a high school, under the care of a teacher who, excellent though her certificates of knowledge may be, has absolutely no time to turn her own attention or that of her pupils to minutiae of demeanor. But, if we were even to hint this in veiled terms to a mother who is anxiously planning how she

may do the best in her power for her daughter, she would probably condemn us for attaching importance to the small things of life rather than to the big ones. But it would not be so at all. There is no reason why the earnest study of music or the classics should not be compatible with daily and hourly training in manners as well, if that branch, as well as the others, has been considered in selecting a teacher. Of course we all agree that big things should come before small. Where we are at variance is in deciding which are the big and which are the small; and in my opinion they are not always divided aright. Give a thing a small name and hang it, in fact; and it is obvious that it is, unfortunately, the people who are most entitled to command our respect by the sincerity and diligence of their work and aims who are apt to put aside the deliberate study of the minor graces of life as being the things of the least importance.

It is a matter of regret that the earnest, the high-minded, the elect thinkers and doers of the world, their energies concentrated on loftier aims, should so often, practically, if not explicitly, condemn the "undue" importance—the very word begs the question—given to what they call trifling observances, on the ground that time and energies are thus diverted from the larger issues. I would diffidently point out that none of these small observances are incompatible with lofty aims and earnest thought. On the contrary, I will venture to assert that not only are they compatible with them, but that every form of good and earnest endeavor will be incalculably furthered by attention being paid to certain details of manner which some people consider trifling, although others call them essential. In this case, as in others, the looker on may see most of the game; and the idler standing by may perhaps realize more

clearly than the active and strenuous workers, whose minds are full of wider aspirations, how greatly their possibilities of usefulness may be minimized, how much the influence of their goodness may be weakened, by being presented to the world under a crude and unattractive aspect. It is quite a mistake to think that goodness unadorned adorns the most. It should have as many adornments as possible, in order that the outward graces may correspond to the inward, in order that the impulse of those brought face to face with it may not be one of involuntary recoil, first from the unattractive manner, and then, perhaps unconsciously to themselves, from the admirable virtues that underlie it.

I go, for instance, to visit a noted philanthropist. I am not there on business, so to speak, and she is not professionally called upon to love me; it is therefore absurd that it should be a factor in my opinion of her real worth that she should forget to pour out my tea, so busy is she haranguing me in a dictatorial and unsmiling manner. I ought to remember that she would hold a cup of water to the lips of a pauper more tenderly than a cup of tea to mine; I ought to remind myself that the manner so displeasing to me has been acquired when exhorting and instructing others less favored by fortune than I, whose horizon she may thus incalculably have widened. And yet I confess that I find myself wondering if it would not have been possible for her to combine both forms of excellence, and to be deferential, courteous, solicitously hospitable to the well-to-do, as well as helpful and admirable towards the badly off; and why, when great and noble ideals of conduct were being placed before her, some of the minor graces of demeanor should not as a matter of course have been imparted as well. It is foolish that we should in our intercourse with a fellow-creature be biased by super-

ficial deficiencies, and thus lose sight of essential excellencies. But we are foolish, most of us; that fact we must accept, however much we should like to think otherwise; and if we honestly search our experience and our memories, we shall realize how much we are liable to be influenced by things which appear insignificant, we shall recall how slight an incident has sometimes produced an unfavorable impression that is never wholly erased. I remember an instance of this which struck me very vividly. A septuagenarian of dignity and position, Sir X. Y., happened to meet at a public gathering Mr. Z., another magnate of his own standing, full of years and of worth. Mr. Z. was anxious to enlist Sir X. Y.'s interest in a certain scheme, and to obtain his co-operation and pecuniary support. And he would doubtless have succeeded, for Sir X. Y., an urbane old man, albeit with a clear consciousness of his own deserts, was entirely well disposed, and advanced with outstretched hand to greet Mr. Z. with cordiality. But, alas! at that moment Mr. Z. happened to see some one else by whom his attention was suddenly diverted, and, all unwitting of his crime, he shook hands with Sir X. Y. without looking at him, thereby losing in that one moment of thoughtlessness the good will of his interlocutor, his kindly interest and his possible help. Mr. Z. had almost certainly been taught in his youth always to give his right hand instead of his left when shaking hands with people, and he had probably learnt it so thoroughly that it would never have occurred to him to do anything else. But he has apparently not been taught also to look his interlocutor in the face at the same time, as if it gave him pleasure to meet him. And yet this supplementary ordinance might have been just as easily and thoroughly taught as the first rule, if it had occurred to any one that it was neces-

sary and advisable to do so. We could all of us, probably, cite many instances of the same kind. Mrs. A. and Mr. B. being both interested in a certain school, Mrs. A. went to see Mr. B. to discuss with him some point in the management of it. Suddenly Mr. B. caught sight of an open letter lying on the table in front of him, and he took it up and looked mechanically through it while she spoke. The result was that, although he was in reality more than willing to meet Mrs. A.'s wishes about the school, his manner, quite unintentionally, produced a feeling of unreasoning resentment in her, and she was far more angry with him for agreeing inattentively with her views than she would have been if he had differed from them after listening to her attentively and courteously. All this means an absolutely unnecessary expenditure of energy. Mrs. A., being given the wrong bias at the beginning of the interview, was then annoyed with herself for being annoyed with Mr. B.; the irritation in her manner communicated itself to his, according to a law of nature as definitely ascertained as that of the propagation of the waves in the ether, and the question they had met to discuss was settled with an incalculable amount of friction, which might have been entirely avoided. It arose purely from Mr. B.'s defective training in manners. He had probably been taught as a definite precept of conduct in his youth, obeyed ever since quite unconsciously, without a separate effort of will or intention, to get up when a lady entered his room, and not to sit down with his back to her afterwards; but it would have been well for him if he had also been taught not morally to turn his back upon her by reading a letter while she was speaking to him of something else. This is one of the most exasperating and most prevalent forms of bad manners, and it reappears in an infinite variety of snapes.

Mrs. E. went one day to see Mrs. F., who is renowned for the rare gifts of her mind, heart and intelligence. Mrs. E. was prepared to be impressed by her, to admire her, to be guided by her. But, behold! during the whole of their interview, in which, indeed Mrs. F.'s utterances were all they were expected to be, she entirely impaired the effect of them by looking at herself in the glass all the time she was speaking. And somehow, however unreasonably, that trifling manifestation outweighed in the mind of her hearer all the brilliancy and charm of her talk, and those few moments of intercourse, so eagerly anticipated, remained in the mind of Mrs. E. as an acute disillusion. Mrs. F. would probably much have regretted this result, if she had known it, for even brilliant and superior people, I imagine, would prefer not to produce an impression of disillusion; and in this case, as in most others, it might quite well have been avoided. Mrs. F. ought to have been taught betimes, as everyone should be taught, not to look at her own reflection at the wrong moment; to be able to pass a stray and unexpected glass without looking in it, and, especially, never to watch herself in one while talking to other people. It is not wicked, of course, to look in the glass at the wrong moment. It is merely absurd. But why should we be even absurd if it can be avoided? There is no reason why people should be either ridiculous or displeasing in their social relations, if they could only be taught, at an age when they are still teachable, to curb the indiscretions of their outward manifestations; if only an onlooker were allowed on occasion to cry "*Casse cou!*" as in the French game of our youth, when a blunderer whose eyes were bound was about to stumble over some unseen obstacle. I once heard a boy of nineteen, in conversation with a listener of more than twice his age, preface a quotation by saying: "As

was well said by a great and good man, *whose name you may perhaps have heard, . . .*" (The italics are mine.) I longed to cry "*Casse cou, young man, casse cou!*" for I felt that in the listener's mind that excellent youth, a devoted son and brother, honest and upright, and inwardly everything that could be desired, was being judged, tried and condemned for ever on account of his condescending manner. For affably to assume that a middle-aged interlocutor might perhaps just have heard the name of a writer with whose works the young gentleman himself was apparently well acquainted was exactly one of the things I would have young people taught to avoid. Indeed, at any age it is a safe rule to follow never to appear to think that a subject of which one is speaking requires explaining, or to assume that a piece of knowledge quite familiar to one's self is not equally so to other people.

Oh, that these things might be taught calmly and urbanely, on general principles! Oh, that it were possible to have a sort of night-school for adults, where certain obvious platitudes concerning the conduct of human intercourse might be learnt, without being either given or received with the evil animus of personal application! What a different aspect they would present to the hearer, and how much more ready he would be to assimilate them! For there is no doubt that the personal bearing of the question makes all the difference. It is quite conceivable that even the most universally accepted and revered of general maxims, such as "Thou shalt not steal," say, or "Waste not, want not," would, if levelled pointedly at one's self, take quite another aspect from that which they present when offered impersonally as part of a general code of morals. This bringing in of the personal element, with its unsatisfactory results, is one of the great drawbacks to the direct

teaching of manners as at present attempted in the family circle, and neutralizes the effect of it just at a stage when such teaching, if undertaken and carried out successfully, would be of inestimable advantage to the learner. It is obvious that this is likely to be so. Parents, even those who are more or less alive to the importance of demeanor, content themselves, while the child is young, in instructing him, as we have said above, with great thoroughness in the elementary rules. That being successfully accomplished, it does not occur to them to consider or discourse upon any wider aspects of the subject, until they suddenly discover one day that, the time of childhood being passed, the manners of the grown-up young man or woman are not all that their fond parents imagined they would be. This deficiency being disagreeably and crudely revealed by some peculiarity or lapse of manners, flying in the face of some idiosyncrasy of the parents' own, is therefore rebuked by them with much more animus than the occasion warrants. For be it said, incidentally—it is a conviction sadly forced upon one as experience ripens—that the parents' standard of their children's wrong-doing is apt to be chiefly a standard of different doing, and it is no wonder that young people should often rebel against so imperfect a code of morals.

This is not the place to enlarge on a subject on which so very much still remains to be said: the best way of bringing about satisfactory relations between parents and children. I will only say that it seems to me that here, too, we are apt to underrate the importance of manner and manners; and that when, a year or two ago, the subject was vigorously discussed in print, the people who were all for having recourse to heroic remedies—latchkeys, Wanderjahre and separate incomes—were going too far afield for the solu-

tion of the problem. I believe that if older people were more careful not to weaken the effect of important and necessary admonitions by a series of daily and hourly minor rebukes, often uncalled for, and arising from irritability as much as from conviction, they would not find themselves nearly so helpless at the moment of essential and inevitable divergence of opinion.

The demeanor of the younger generation is a good deal criticized in these days, and I cannot deny that much of the adverse criticism may be true. I am ready to admit that the manner of some young men—not of all—is conceited, familiar, totally wanting in distinction and in chivalrous courtesy. But this, perhaps, is partly due to the fact that the manner of some young girls—not of all—is characterized by an unpleasing decision, by a want of dignity and reserve, by an ugly sort of slap-dash assurance, and by a total want of delicate half-tones in the atmosphere which surrounds them. I deplore all these regrettable manifestations. I deplore that there should be sons who come down to breakfast with a scowl, and daughters who contradict their mothers; and I sympathize with the grievance, if not with the clamor, of the people who write articles in magazines and newspapers to complain bitterly of the manners of the present day, and especially of the want of deference shown by the young to older people. At the same time, I fancy that statistics would show that these articles are all written by the generation that is offended by that want of deference. Young people do not, as a rule, write articles on the manners of older ones. That, at least, we have so far been spared. But I fancy that if they did, and put forth their views with the candor with which their own manners are criticized, we should find that they, in their turn, were often very unpleasantly affected by our manner. If they were always

addressed courteously and smilingly, never admonished irritably—and of one thing I am quite sure, that the wrong moment to rebuke a fault is when it has just been committed—never silenced, or snubbed, or sneered at, however much their utterances may seem at times to demand such treatment, they would probably in their turn feel inclined to reply more amiably, and we should perhaps not hear of so many despairing discussions and inquiries as to the best way of getting on with one's family. But, instead of this, it is too often taken for granted that in the home circle it is allowable, and even advisable, to dispense with the small adornments of every-day courtesy. The influence of such a code on the grace of daily intercourse must necessarily be disastrous. Some children I once knew used, whenever they handed a thing to one another, to do so combatively, with a violent push, which invariably succeeded in infuriating the recipient. The same unpleasing effect is produced when children of a larger growth continue the process, and push their remarks or their arguments home with a momentum which arouses an unreasoning fury in their interlocutor. We all know what it is to argue with such people. It is like trying to write one's opinions on sandpaper instead of on a fair white sheet. It is a crime to allow a human being to grow up with such a manner.

If urbanity were persistently taught and practised in the home there would not be so much to learn, and especially to unlearn, with regard to intercourse with the world at large. People would not then have two manners—one to use in public, and one in private. There would be less self-consciousness and less affectation, for these arise from trying to do a thing of which we are uncertain, to assume a manner which we have imperfectly acquired.

I am not saying, of course, that in every respect the code of behavior

should be the same at home as abroad—that would be absurd; only the difference, it seems to me, should lie in the direction of there being less reserve in the family circle than among strangers, but not less gentleness and courtesy. It would not be in the least a fault of manners, for instance, for a child to fling himself on his mother's lap and throw his arms around her neck, although it would be very ill-mannered if he were to do the same to a visitor. But if he were to bang the door in his mother's face, that would be just as ill-mannered and just as inadmissible as if he had banged it in the face of a stranger. Often I have seen a mother—put to shame by her children's rudeness to a visitor in this respect and others—scold them roundly and unavailingly for continuing to do the ugly thing in public that she had tolerated their doing every day in the family circle. I saw the other day a young girl, gently born and anxiously brought up, coming into a drawing-room at an afternoon party just as a dowager was leaving it. To my amazement, the girl, instead of stepping back and allowing the older woman to pass her, pressed forward with all the impetus of her youthful vigor, so that the departing guest was fairly hurled back into the room, and had to wait to go out until the newcomer had pushed her way past her.

This sort of thing ought not to be possible. And the responsibility for it lies entirely on the shoulders of the parent; for it is evident that if the girl had been taught always to step back and to yield the way to older people, she would have done so on that occasion also, gracefully and as a matter of course, and have thereby made a pleasant impression on the mind of the beholder instead of a distinctly unpleasant one. We are told that in the days of Mrs. Chapone there stood in the courtyard of a boarding-school at Brighton an empty coach, in order

that the young ladies—it was part of their daily course of study—might practise getting in and out of it without showing their ankles. I am not advocating that this practice should continue. I fear that some of the modern pastimes to which young women are addicted necessitate showing a good deal more of their ankles, to put it mildly, than the contemporaries of Mrs. Chapone would willingly have beheld. But I do think it would be an excellent plan, although I fear it might be attended with some practical difficulties, if an empty railway carriage could stand in every courtyard, with a crowd of intending passengers to practise upon. Then people might study the art of getting in quietly, courteously, and in their turn, instead of pushing their way past in order to get in first, declining to make room for other people, and generally indulging in all the numerous forms of bad manners that railway-travel seems to induce. Such an exercise would also be found useful as a guide to behavior at drawing-room entertainments and other occasions of the same kind where the object apparently is to secure the best seats at any cost of manners.

How delightful it would be, though perhaps such a project is only a rosy dream, if a class could be formed, just as classes for learning the minuet have been formed, for instruction in demeanor in a drawing-room, showing in-practice as well as in theory how to move through it with ease and dignity, how to behave when listening to conversation or joining in it, when listening to music, when playing cards or round games! Demeanor at games is one of the things that the best-behaved fall short in, and unless it be taught in the home, where there are countless opportunities of doing so, it will never be learnt at all. I have been stupefied sometimes, when watching in a country house some draw-



ing-room game of the kind that has to be decided occasionally by the verdict of the players, to see the people that I have been accustomed to consider the most punctiliously polite develop the most surprising acrimoniousness, rudeness and self-assertion. If this is not remedied in childhood it will never be cured. One feature of the excellent work known as the Children's Happy Evening Association is, I am told, that it teaches the art of playing together pleasantly and harmoniously to poor children whose only previous notion of a game had been to cuff or abuse the one who got the better of them. I only wish this training could be extended to other circles, and that some of those very people, perhaps, who have been playing with the children at the East End, could, when back in their own surroundings, have people to play with themselves, and to teach them the art of politeness over a game of cards or of letters. Perhaps some philanthropic dukes and princes could in their turn give up an evening a week for that purpose.

In conclusion, then, what we want is some scheme by which a complete training in demeanor should form part of the regular curriculum. The method of tuition, instead of, as at present, consisting of haphazard scoldings, should consist of a systematic course of instruction in the higher branches of manner or manners, to follow as a matter of course the elementary grounding. It is unreasonable to expect, as we do at the present, that young people arrived at a given stage of existence would know by intuition that which we have never deliberately tried to teach them. Let us help them, therefore, to acquire sometimes certain general maxims of conduct, which should be contained, like other branches of knowledge, in a book compiled for the purpose. I attach great importance to their being in a book. The mere fact of seeing such

maxims—at present handed on to us, if at all, by oral tradition, as if we were Druids, and that in an infinite variety of imperfect forms, according to the transmitter—clearly defined and set down in print would place them in quite another aspect, would increase our confidence in them, and would be of great help to us in carrying them out. And since there is nothing that teaches a thing so thoroughly as trying to impart it to others, the constant use of this handbook will be, probably, of inestimable value to those who teach from it as well to those who learn. It must have come within most people's experience to realize the influence that has been exercised by some home-grown precept of behavior that they have been accustomed to hear from early years. How often you hear a man or woman say, when explaining some course of conduct, "My father and mother used always to say . . .," and then follows some rule of the road of life, which, from its very simplicity, has been useful where more elaborate exhortations have been forgotten. As an instance of the persistent influence of such a precept—although in this case not very successful—I may cite a most estimable member of society, who would have been altogether delightful if his mother had not impressed on him in his youth that it was very rude ever to leave off speaking. Whatever interesting general conversation was going on, therefore—and it is essential to be able on occasion to take part in general conversation as much by appreciative silence as by voluble participation—he never suffered silence to reign in his own little corner, but would continue, during the most enthralling utterances of some distinguished talker, to pour into the ear of his distracted neighbor some tedious commonplace on the weather and the academy, feeling, in consequence of his early training, that even this was better than nothing. This was an

error of judgment, no doubt, on the part of his mother; but to see the necessity of impressing such precepts at all on the mind of a child is a step in the right direction. And the error of judgment simply shows the necessity of having them formulated with care and discretion. In China, we are told, it is stated in the classics that the laws and rules of ceremony are three hundred and the rules of behavior three thousand. We in this country cannot, I fear, hope for a code so complete, although there is no doubt that we should most of us be the better for a few hundred suggestions on the subject. But, without going even to that length, there is no reason why the laws of behavior should not be as clearly stated as those of golf or cricket, and, presented in this systematic form, as easy to acquire. Most young people know in these days that a golf player must not strike a ball from the tee until the player in front of him is two strokes ahead. That rule, amongst others, is put up on every golf ground. But they do not know, since it is not put up in every drawing-room, that very much the same rule should be observed in conversation. A golf player would not think of standing quite close to the tee from which some one else is driving off, with his club raised to strike before the other has well played. But when he is playing the game of conversation, he thinks nothing of standing impatiently, with his mouth open, while the other player is speaking, obviously not listening, but waiting to speak himself the moment the other shall have done. He obeys the former rule because he has seen and heard it clearly stated as a rule of the game; he transgresses the latter one because he has not seen or heard it so stated.

These rules, therefore, should be drawn up and tabulated in a convenient form. The manual thus compiled should, when illustrated by examples

and a copious commentary, form a complete code of minor morals, and should serve as a handbook to the gentle art of human intercourse; holding a place between the manual of etiquette on one side, which deals only with immaterial and fleeting details of usage, and the teachings of a wider morality on the other, dealing with the laws and motives of conduct, and not with their outward manifestations. The ordinary manual of etiquette, as we know it at present—we probably all of us smile at the name—is not a very useful adjunct to demeanor, although it is quite conceivable that it might be more valuable if done upon slightly different lines, and with a little more subtlety of discrimination than usually accompanies it. We have yet to be given a book of the higher etiquette, if I may so call it—a book of precepts for every-day conduct done on simple lines, and giving us, not only the general outline of what I may call our trivial duty to our neighbor, but also suggestions in detail, which would be most specially useful. We all know how sometimes some quite simple suggestion has enabled us to avoid a pitfall, to remove a stumbling block of which we were unable to discover the cause. We know how maddening it is when a piano jingles or a machine sticks for some mysterious reason that we cannot discover, and how intensely grateful we are to the person who shows us where the difficulty lies and enables us to remove it. Just as grateful should we be to the person who, when our manner jingles, so to speak, and causes our friends to avoid playing upon it, can, by proposing a simple expedient, put us on the right lines to remedy the defect. And here let me again plead that these suggestions should not ascend to too lofty an altitude. The unfortunate offender in these matters is apt to be approached on the highest moral level, and given to understand that unless he alters his

whole nature, and gets him a new heart, he cannot hope to mend the error of his ways. This, if I may be forgiven for saying so, is a very needlessly heavy and discouraging line to take, for it is much more difficult to alter one's heart than one's manner.

We will suppose, for example, that you have become conscious of the disheartening fact that you fail to please your neighbor; and a deadly fear seizes you that it may be because you have bored him. If you should seek the best way to remedy this state of things, the advice you would be most likely to receive, either from yourself or other people, would be to the effect that in order to please others you should be unselfish and love your neighbor better than yourself; you should cultivate humility, generosity, charity, and many other virtues. But the result of this will probably be that the unfortunate offender, horribly discouraged at having so vast a field of moral achievement presented to him, and not knowing from which point to approach it, will content himself by endeavoring, as before, to comply in the general with all that the code of morals prescribes, while he continues in detail to annoy his fellow-creatures at every turn, for want of some simple rule of behavior quite easy to carry out.

For instance, we are told as a general maxim that we should sympathize with other people's joys and sorrows; and so ready are we to comply with this precept that we all fondly believe we carry it out. So presumably we do, in intention. The mistake is that we do not always translate this intention sufficiently clearly into words. Indeed, we often convey an impression quite opposed to that of sympathetic benevolence. We should probably none of us acknowledge, or even conceive it to be possible, that we should not be sorry to hear of another person's suffering, whether mental or physical. And

yet, if an instance of it is brought before us in a concrete form, by the sufferer telling us of a bad night, a chronic complaint or the misdoings of an unruly servant, what do we do? Do we seem sorry? Do we concentrate our attention on the misfortunes of the narrator and pour consolation into his ear? Not at all. The moment his grievance has left his lips we instantly reply by a similar grievance of our own, for which we demand his sympathy instead of presenting him ours. I think I am well within the mark in saying that on eighteen out of twenty occasions in which one human being says to another, "I awoke at five this morning," or "I didn't close my eyes until dawn," the other one will reply, "And I woke at four," or "I didn't go to sleep until the sun was shining." Let the observer whose attention has been called to this topic notice, for example, at a breakfast-table in a country house, how, if one person says he has been awakened by a thrush at 3 a.m., he will in one moment be in possession of the experience of the entire table, without one word from anyone of comment or sympathy on the experience of others. Indeed, the interested observer will probably be conscious that he has to withhold himself by main force from contributing his own quota to the list. Let one of the simple rules to be contained in our book, then, be, never to say how you have slept yourself when your neighbor tells you what sort of a night he has had. Such a rule will be easily remembered and the habit of complying with it easily acquired. It sounds trivial and absurd, no doubt; but I believe that compliance with a score of such maxims, judiciously chosen and constantly obeyed, would make more difference to each one of us than we are well ready to imagine, and would be of incalculable help in oiling the wheels of daily intercourse.

And to make the machinery of life

run smoothly is surely well worth doing, instead of daily throwing a handful of sand among the wheels; for it would be as easy to pick up again one by one actual grains of sand so thrown, and reassemble them in one's hand, as to remove the effect of a hundred little crudities of manner and manners with which some people are wont to roughen the path of life for themselves and for others. These are the things which stand in the way of success; not only of "worldly" success and advancement, to use the conventional expression in its most grovelling sense, but of that other success, worldly too, perhaps, but in a higher sense, of making the best of this world while we live in it in regard to our relations with our kind. Let us realize that this lies a great deal more within our own hands than we are apt to think. Let us help one another to learn the way of achiev-

ing it. It means taking a good deal of trouble, no doubt; it means a good deal of deliberation and sustained effort, and, at the same time, will depend a good deal more on the small things we do than on the big ones. This thought is not necessarily comforting. It is to many people rather the reverse; for in our hearts we most of us agree with the Eastern proverb, "One great deed is easier than a thousand small ones." But the great opportunity, that we should doubtless so promptly and brilliantly embrace, does not come to us all; and, instead of letting so much potential heroism run to waste, we had better employ it in the countless daily opportunities that we all have of winning by the veriest trifles—or of putting away from us, as the case may be—the good-will of our fellow-creatures. — *Nineteenth Century*.

## THE GENESIS OF GEOMETRY IN THE RACE, AND THE EDUCATION OF THE INDIVIDUAL.

BY BENCHARA BRANFORD.

(Continued from page 300)

Of these professional mathematicians, the first, and one of the most eminent, was Euclid, who systematized on philosophic basis (with substantial additions of his own) the geometrical knowledge slowly evolved during preceding centuries in his famous "Elements"—a text-book for students of philosophy and science in the then newly founded University of Alexandria, but no fit "meat for babes and sucklings." To educationists it is of the first importance to understand that this highly ambiguous word "Elements" in the title (Euclid's "Elements of Geometry") refers not to the rudimentary psychologic elements in the genesis of the *child's* empirical knowledge of the world around as geometrical, but to the *logical* elements

that emerged finally, after centuries of effort, in *mature* minds as the ultimate outcome of a long line of philosophic abstractions (definitions, axioms, theorems, etc.), whereby geometry was fashioned into a perfect science. To clearly understand this is to perceive the monstrous inversion of natural order exhibited by the present traditional method of presenting geometry to schoolboys in the guise of Euclid. It is a continual attempt to balance a cone on its apex!

To any one who has searchingly examined the method of mathematical education obtaining in this country, and is aware of its grave defects, the application of the above historical epitome, under the inspiration of the dominant idea of this essay (the par-

allelism between the education of the race and of the individual), should now be obvious.

However, to evoke great interest and inquiry, I add a few detailed suggestions. Waiving the vexed question as to the mode of genesis of space-perception in infancy, we come to an age, varying in different children, when under appropriate stimulation, by leading questions concerning objects presented to the senses, the child becomes capable of voluntarily directing its attention to a consideration of the *form* of such objects, to the exclusion of other properties (color, etc.). Its stock of space-perceptions (acquired partly by painful, and partly by pleasurable, struggle with its environment) now gradually becomes transmuted, by external stimulus to its own self-activity, into a *descriptive* knowledge of form, a knowledge in which perceptions fuse together into conceptions by being attached to a descriptive name, so fertilizing is a *union* of language with objective embodiments of form—either useless without the other—in rendering clearer, more true and precise, the early intuitions of the child. Here, as throughout education, the teacher needs faith and tact.

While great care must be taken to avoid over-preciseness in the use of terms, thereby incurring the danger of supplying the word without *any* idea, equally harmful is the other extreme, where it is imagined that the mere examination of an object, without attention to the wonderful function of descriptive language, suffices to stimulate the creative activity of the child. The present evil is premature over-elaboration and refinement of the abstract in the formation of knowledge. A recoil from this is apt to land us in the other extreme of clogging the growth of freedom of thought, either by confusing the ideas with the very wealth of the objects to be apprehended, or by failing to create the

final perfect emancipation of the ideas from the particular concrete embodiments from which in the first instance they sprang. This latter extreme in education entails inability, in subsequent years of life, to make effective use of the narrow and particular for the emergence of the comprehensive and general. The aim throughout the mathematical education is the *mastery* of form by sight and hand and thought. It is neither the purely abstract thinker nor the voiceless intuition of the savage we strive to produce, but the consciously disciplined artist, at once thinker and doer.

Gradually the child gains a store of geometrical knowledge that is clear, conscious, rational, and definite *in comparison with* the mental results of his previous experience, but vague, empirical, and indefinite relatively to the mastery we desire him ultimately to obtain. By appropriate stimulus the child will now be incited to a desire for more exact processes, for fuller, clearer knowledge. The idea of *measurement* waxes in importance; simple instruments are made by the child himself—many and fertile will be the ideas thereby originated—and lengths, surfaces, and volumes yield numerical results under the potent influence of simple arithmetical ideas. Tables of such results (no measurements should be wasted; all should contribute to final results), scanned with lively attention, give rise to new demands on arithmetic; general rules for measurements emerge, with a hint or two from the teacher what to look for, and thenceforward the joy of discovery becomes the most effective of educational agents. Geometrical knowledge and skill in simple arithmetical computations grow *pari passu*; this mutual co-operation and assimilation of the two studies is of the highest importance. At present it is entirely neglected; so that from all sides we find teachers of physics, chemistry,

etc., complaining of the utter inability of pupils to *apply* arithmetic. Observe, throughout these final brief remarks, the historical parallel. Let not the teacher fear to introduce ideas that, probably, in his own education, were the last of a long line of tedious symbols and abstractions extending over years, ideas which lie at the very roots of scientific thought. Thus, in the detailed measurements of triangles of varied form, attention will be drawn to the amount of change produced in the lengths of the sides by certain changes of a definite amount in an angle, one side being fixed, and, say, one angle a right angle (an empirical right angle, at present). Here we have the germs of trigonometry without symbolism. Thus is introduced the idea of a variable magnitude and of mutual dependence; indeed, as Herbart ("The A B C of Sense-Perception," 1803) well remarks, all magnitudes should, from the very start, be so taught as to be constantly considered *fluxional*; it is, perhaps, the gravest defects of present methods that the ideas grow fossilized and the imagination fails to expand, *encountering no external stimulus sufficiently powerful to evoke its finest activities*. Rough measurements of the rapidity with which areas and volumes grow by adding to their linear dimensions prepare for the future easy apprehension of a differential coefficient. Plane surfaces rolled into cylinders and cones and other shapes give access to the idea of a ruled surface; such are the surfaces the pupil's pencils are constantly describing in space, as it is handled. And so on. The pith of the matter is thus eloquently described by Herbart, the great German educationist:—"The A B C of sense-perception," he writes (Eckoff's English translation, page 181), "is only the prologue to mathematics, and is really mathematics which, by guiding, inciting, moving, and satisfying the

speculative interest, should appear under the form of a work of art. But even this little prologue should constitute its preparations towards the result. Let it be clear even by itself; let it be well grounded; let it appeal to the senses; above all, however, *let it point from the small to the great*. It should make felt everywhere the presence of the great science (of mathematics). It ought sometimes to bestow a little gift in its name. By the invisible hand of the great science let it cause a knot to be loosened now and then, or a fault to be rectified. Again, by the omniscience of mathematics, let fault be brought to light, so as to compel their confession by the drawings, the instruments, and the imperfectness of computations. Carelessness and misapprehension especially must not be allowed the slightest hope of slipping through unreprieved.

Noteworthy, as historical parallel, is the attempt of the Greek geometers to square the circle; they attempted to exhaust the circle by means of inscribed and circumscribed polygons with a continually increasing number of sides; here we find the germs of the infinitesimal calculus, crude and empirical at first, subsequently developing into a rigorous deductive process (the method of exhaustion), and, finally, after centuries of laborious thought, perfected by the labors of Newton, Leibnitz, and others. Very obvious is the bearing of this on education.

So far, in the pupil's education, we have assumed that all has been approximate, empirical. That the area of a concrete triangle is practically half the base into the height is, as yet, simply a wide induction. Nevertheless, but little additional stimulus is needed to rapidly convert such empirical facts into scientific theorems; when attention is drawn to the fact that no lines actually visible can be drawn without breadth, and that greater

precision is attainable in our measurements the better our instruments and the finer drawn our figures, the mind is fit for the discovery of definitions and scientific theorems—such as are presented in Euclid. Here, again, lies danger of an extreme. Assuredly it is a fundamental error, in school education, even when the ideas of definitions and theorems have grown familiar, to have that complete divorce between the concrete and abstract which now almost universally prevails. While in no whit deviating from a strictly rigorous use of certain terms and syllogistically stated proofs of certain theorems, a philosophical teacher will continuously make effective use of the fact that, at every stage of scientific mastery by the pupil, there looms certain material of knowledge which can best be first assimilated *empirically*, and should only gradually be subjected to the stricter demands of exact, abstract reasoning.

Turning to history, we find that never without detriment to pure science has the abstract been long divorced from the concrete. Modern educational experience amply exhibits the pernicious effects where teaching is restricted to the purely abstract. It is not long ago since Euclid was *memorized by rote!* The fact that all measurement of nature is necessarily approximate, never exact, is a truth that appears to have been almost completely ignored in mathematical education, fundamentally relevant to the matter as the truth obviously stands. Approximations, concrete applications of pure theory, should occupy throughout the educational curriculum a fundamental place. It is clearly possible to present such practical problems that the very effort to attain a solution leads to the demand for still higher and fuller theoretical knowledge. Let us here employ to the fullest that principle of all mastery: "Studies perfect nature, and are perfected by experience."

If this criticism is valid, then we soon become convinced that the isolation that now exists between geometry, arithmetic, algebra, etc., is radically vicious. "Arithmetic is one thing, algebra another, geometry a third, and so on. We learn them from different books at different hours. We are ignorant of their relation and mutual helpfulness." Such, doubtless, is the attitude of the average school youth when attention is directed to the question. Yet, what is the worth of all these studies unless every conception, finding its appropriate place in the scheme of all the rest of our knowledge, helps to a more clear, unified mastery of facts? *Juxtaposition of subjects in the curriculum does not imply harmonious assimilation of them by the mind of the pupil.* Without any resulting confusion, all these branches of mathematical study can be commingled and become materially helpful, so that the mind sees its mathematical conceptions and processes in the light of a beautiful, well-ordered, and powerful *whole*, instead of a thing of shreds and patches.

The present extraordinary insistence, in elementary teaching, upon a comparatively few ideas, their tedious elaboration and fixation by mere rote—work without stimulus to the evolution of imaginative self-activity, critical taste and inventiveness—all ultimately lead to inability to grasp new ideas when they are encountered suddenly in the higher branches, clothed gorgeously in strange symbolism. The remedy for this is to keep the invention ever at work, and the assimilative function fresh and vigorous by constantly bringing down for discussion and simple application into the very elements those fruitful and great *ideas* that certainly demand ultimately for deeper treatment a special symbolism for themselves, but which are relatively simple in inception when divested of such symbolism. The plotting of curves, modelling of surfaces, with the

concomitant ideas of analytical geometry (plane and solid), the fundamental ideas of the calculus (differential and integral) through approximations, the plentiful use of axioms (not restricting the science to a minimum of such, with resulting tediousness and great loss of power)—all such conceptions it is desirable to create as speedily as the interest is sure to be awakened in them.

Here, again, the teacher must be inspired with knowledge, not only of these higher branches, but of their gradual historical evolution. Seeds of thought must be planted long before they grow to perfection and ripeness. Above all must he have faith in the intelligence of his pupil and the great future in store for it under the guidance and stimulus of sympathetic teaching.

Of course, in introducing these ideas of mathematics so much earlier than usual, we must not make the mistake (which would be identical with that at present perpetrated in commencing geometrical education with abstract Euclid) of attempting to present them in completed abstract form—an attempt certain to result in dire failure; but we must give simply the germ of each idea in particular concrete clothes; perception by the senses should precede the pure resulting abstraction. Thus should the abstract constantly alternate with the

concrete; the empirical *periodically* precede the scientific on ever higher and more difficult planes of inquiry.

As regards the attitude of the pupil, this should be one of disciplined self-activity and invention, the motives being partly the desire of applying his knowledge to interesting concrete problems, and partly (so far as distinguishable from the other) his own curiosity about the wonderful properties and development of these abstract creations of the intellect.

Finally, looking back on modern educational experience, we see mathematics employed in the education of one generation in the way of dogmatic rules of thumb, an extreme of concrete presentation; in another generation we get the other extreme, where the presentation is so purely abstract at the very outset that Euclid is generally learned by rote! The genesis of geometrical knowledge in the race clearly indicates the most efficient order of development for the individual—*incessant action and reaction between abstract thought and concrete measurement.*

Moreover, only thus can due scope be given for the exhibition of those powerful varieties in intellect and character amongst the pupils upon the due development of which depends, obviously, the progress of the race. Here, finally, we note again the suggestiveness of our parallel for educationists.

"The defects of Aristotle's view of man's destiny are the defects of all that is Greek. They are two: (1) Its ideal is intellectual and æsthetic—a coordinate, harmonious whole, whereof the individual is but a part; not moral or religious—a self-surrender of the individual to the supreme will; consequently (2) it does not provide for every human being, as such, but only for a small, select number, the fruit of the whole. Its ethics are institutional, not personal, and, indeed, the

Greek never arrived at a distant conception of personality, that being possible only through the moral consciousness, which is its core. It seeks to find happiness in a correlation and balancing of individual selves, not in the independent conformity of each self to a supreme self. Hence it was that, with all its marvellous grasp and manly prudence, the ideal of Aristotle proved powerless to restore the moral unity of man, until it was absorbed in a higher."—*Thos. Davidson's Aristotle.*



## PRINCE EDWARD ISLAND TEACHERS' CONVENTION.

BY INSPECTOR G. J. MCCORMAC.

The Nineteenth Annual Convention of the Teachers' Association of Prince Edward Island was held in the Y.M.C.A. Hall, Charlottetown, on Thursday and Friday, 6th and 7th October. There were 200 teachers in attendance. The president of the Association, Principal Campbell, of Summerside High School, presided at all the meetings. On Thursday forenoon the Association had the pleasure of visiting the Charlottetown Kindergarten, conducted by Miss Sayre. Here two hours were spent very profitably, as well as pleasantly, and all left very favorably impressed with the benefits of the Kindergarten as a part of our school system.

At the afternoon session a well written philosophical paper, entitled "The Human Soul in Education," was read by Mr. J. A. Ready, B.A. In it he described the several faculties of the soul, and claimed that the aim of true education must be the deepening of spiritual life, so that the soul of man shall bless the earth by its presence and work, and ultimately return to the bosom of the God who gave it birth. Prof. Hickman gave a very interesting talk on "Nature Studies," which was much appreciated. He asked for a more general recognition of the value of nature studies as an educational force, and a more frequent use of such studies, particularly in the rural schools. The study of nature is the best and highest foundation for morality, and a preparation for the revealed truth that comes to the child later in life. Froebel says "the spirit of God rests in nature, lives and reigns in nature, is expressed in nature, is communicated by nature, is developed and cultivated by nature."

On Thursday evening a public meeting was held which was largely attend-

ed. F. P. Taylor, M.D., a member of the City School Board, presided, and introduced as the first speaker His Worship Mayor Warburton, who in behalf of the city extended a warm and cordial welcome to the teachers. He urged upon them to endeavor to form a Maritime Teachers' Association, where a wider interchange of ideas would be effected, and suggestions, mutually beneficial, would be given. He hoped the next mayor of Charlottetown would have the honor of presiding over a Maritime Teachers' Association. President Campbell replied, thanking the mayor for his very hearty welcome. His address was concise and pointed. He showed up some of the defects of our school system—the want of normal training for teachers, and the want of sufficient remuneration for teachers. The salaries paid our teachers are so small that our best teachers regard the profession as an admirable one—to get out of as quickly as possible. Good schools, and progression, he said, poor schools and stagnation—these are as closely allied as cause and effect. The country with poor schools must soon scramble for the crumbs that fall from the table of progressive countries. Just as a woodman can make progress without sharpening his axe, or a farmer without cultivating his corn, so can a country advance without improving its educational system. The teacher makes the school. He is the soul, the heart, the life of the school, and in the school are laid the foundations of our country, be they sound or unsound. Mr. G. N. Hay, Ph.D., editor of *The Educational Review*, St. John, supported Mayor Warburton's remarks anent a Maritime Teachers' Association, and then read an admirable paper on "The Modern Aspects of Education."

Prof. Hickman spoke briefly on the "School System of Nova Scotia."

Chief Superintendent McLeod was the last speaker. He spoke on the teacher as a force in the formation of character, and pointed out the great influence which the teachers have either for good or evil.

Besides the addresses the audience was favored with readings, recitations, and vocal solos.

At Friday's forenoon session Inspector McCormac read a paper entitled "The Spirit of the Teacher." Mr. Hay gave a very instructive lesson on "Botany," and Mr. H. J. Palmer, Q.C., made a very appropriate speech on "Composition." Mr. Palmer said he was greatly pleased with the remarkable progress made in teaching the higher branches, but thought that more time and attention should be devoted to composition. Students go through college, and yet have a very inadequate grasp of composition.

At the afternoon session Principal Seaman moved a resolution strongly censuring the government for the re-

peal of the supplementary clause of the Public Schools' Act. The clause referred to read as follows: "Every teacher shall be entitled to receive from the Provincial treasury an amount, in addition to his statutory or regulated salary, equal to any amount raised for his support by the district by the local assessment upon such district not exceeding twenty-five dollars." (This section was repealed at the last session of the Provincial Legislature.) Quite a lively discussion followed. Premier Farquharson and Mr. D. A. McKinnon, M.P.P., were present, and spoke in response to an invitation from the President. After a resolution in favor of withdrawing the resolution under discussion was voted down, the motion was carried by a standing vote, only two opposing it out of the large number of teachers present. The election of officers was the last work of perhaps the most successful and most beneficial convention ever held by the teachers of the Island Province.

St. Georges, P.E.I., Oct. 18, 1898.

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### "THE OLD ORDER CHANGETH."

It is not very long since ex-President Cleveland, in the course of an address to the students at Princeton University, took occasion to comment on the fact that American politics do not attract the most highly educated and most cultivated men. "It is," he said, "exceedingly unfortunate that politics should be regarded in any quarter as an unclean thing, to be avoided by those claiming to be educated or respectable. I would have those sent out by our universities and colleges, not only the counsellors of their fellow-countrymen, but the tribunes of the people, fully appreciating every condition that presses upon their daily life, sympathetic in every untoward

situation, quick and earnest in every effort to advance their happiness and welfare, and prompt and sturdy in the defence of all their rights." We commend these statesmanlike words to students who are just now gathering at our Canadian universities, we presume, with an aspiration to become nation builders. It may be asked, however, what the universities are doing towards the direct fulfilment of this the end of their existence, namely, the preparing of men to be the leaders of the masses. The United States possesses about four hundred universities or colleges with university powers, and the annual output of men, more or less fairly educated, is enormous;

yet it appears to affect only in a very slight degree the situation deprecated by the President.

In British politics, university men predominate among the legislators, many of whom, like Burke, Brougham, Earl Derby, Gladstone, the Marquis of Salisbury and Curzon, have been equally distinguished for statesmanship and scholarship. It is true that there is no official recognition of the science of politics at either Oxford or Cambridge, but unofficially, among the students themselves by means of their debating societies and political associations, training in practical economics of no mean order is obtainable, and which, in many instances, has paved the way to success in the highest arena. It has been aptly, if somewhat paradoxically, said that the universities of Oxford and Cambridge are aristocratic associations with democratic proclivities, and it is certain, in modern times at least, that nowhere has ability a better field or snobbery less encouragement. No doubt things have much changed since the days of Chaucer's Clerk of Oxenford, who

... was lever han at his beddes hed,  
A twenty bokes, clothed in black or  
red,

Of Aristotle, and his philosophie,  
Than robes riche, or fidel, or sautrie,

but, on the other hand, at neither of the great universities would a "nouveau riche" find it possible to provide a newspaper paragraph like the following: "Morley Hall is the finest of the new Harvard dormitories, and the young man's rooms will be the most magnificent in the college. He planned the decorations himself. The living apartment consist of a study and a

large alcove. These two rooms are finished in sage oak. The woodwork alone will cost a thousand dollars. It is in the old English style. The carved panelling reaches five feet high. Then come two feet of green Japanese cloth, and then woodwork which reaches the ceiling. The floors are of hardwood. A large sage oak window seat has been built in the study and the alcove has a magnificent oak bookcase built in the wall. The furnishings are to be in the old English style, rather in the dark order, and sombre. This will be relieved by a hallway entrance which is finished in crimson."

The founder of the family of the young man who departs so far from democratic simplicity is said among his various avocations to have at no far back date followed that of hawking oysters. A nominal university education, obtained amid such Sybaritic surroundings, is not the most admirable method of raising up "tribunes of the people, fully appreciating every condition that presses upon daily life." If sumptuary laws are justifiable anywhere it is surely in institutions of learning, where rich and poor should meet on equal footing, and where intellectual ability and character alone should confer eminence. But far better than regulation is the public spirit which happily prevails in our Canadian institutions which within university precincts frowns down all class distinctions, whether of inherited culture or of mere wealth, and which gives little or no encouragement to the invidious fellowships of secret societies. The development of patriotic citizenship and of devotion to the cause of humanity should be the guiding principle of all educational organization.

LIFE IS STRUGGLE.

To wear out heart and nerves and brain  
 And give oneself a world of pain ;  
 Be eager, angry, fierce, and hot,  
 Imperious, supple— God knows what,  
 For what's all one to have or not ;  
 O false, unwise, absurd, and vain !  
 For 'tis not joy, it is not gain,  
 It is not in itself a bliss,  
 Only it is precisely this  
     That keeps us all alive.

To say we truly feel the pain,  
 And quite are sinking with the strain ;  
 Entirely, simply, undeceived,  
 Believe and say we ne'er believed  
 The object, e'en were it achieved,  
 A thing we e'er had cared to keep ;  
 With heart and soul to hold it cheap,  
 And then to go and try it again ;  
 O, 'tis not joy, and 'tis not bliss,  
 Only it is precisely this  
     That keeps us still alive  
     —Arthur Hugh Clough.

EDITORIAL NOTES.

Deliver not the tasks of might  
 To weakness, neither hide the ray  
 From those, not blind, who wait for day,  
 Tho' sitting girt with doubtful light.

“ That from Discussion's lips may fall  
 With Life, that working strongly, binds—  
 Set in all lights by many minds,  
 So close the interests of all.

Orchards are known to have what are called their “ off-seasons,” and so may teachers' conventions, and perhaps one of the most noticeable of such phenomena was the convention of teachers lately held in Montreal ; at least, so we gather from the somewhat meagre newspaper reports of the meetings, and the congratulatory motions which had to be passed at its close to give the affair an appearance of success. This is not likely to occur at the next annual gathering, when the presence of Dr. Robins in the chair will, no doubt, give the proceedings an *éclat* which that gentleman's experience as a presiding officer and as an educationist of the higher gifts is sure to bring to the office. When it is said that the proceedings were not much of a success, it must not be supposed that there were no important points of educational interest to the teachers of the Province of Quebec discussed. In some of the public addresses, as in Professor Clark Murray's paper on child study, or “ The Child Problem,” and in Dr. Field's investigation of “ School Eyesight,” there were set before the teachers the necessities which ought to drive them, if they would be successful, back to first principles ;

while in Miss Edey's paper on “ The Country School and its Work,” in Mr. H. A. Honeyman's enumeration of the “ Distracting Elements in School Life,” in Mr. E. N. Brown's paper on “ The Spelling Question,” in Miss Margaret Ross's presentation of how to teach “ Elementary Geography,” in Dr. Adams' illustrated lecture on “ Physical Geography,” in Mr. George A. Jordan's address on the “ Functions of the Local Association, and in Mr. Arthy's paper on “ Arithmetic,” there were presented many phases of school work interspersed with wholesome pedagogic suggestions. The reports from the various committees and sub-committees were received and adopted, and the reforms indicated by them are likely to be inaugurated by the new executive. The proceedings were not barren of interest, but they were as near being so, it is said, as the friends of the Association would care to see the proceedings of any subsequent convention.

The elections, as usual, were guided by a new method of procedure. In connection with the organization and government of the Quebec Association, it seems that a new procedure is

invented once a year, and its constitution, if these inventions continue, is all but sure to become an ethical curiosity worthy of examination even by such a high authority as Sir John Bourinot himself. If the Association is losing its prestige, there are some gentlemen connected with it who are bound not to lose their prestige as long as its executive holds together; and the teachers themselves have now lost for the most part their interest in the results of the election, refusing to vote, and only laughing at those who succeed in selecting the officers of the Association by methods which even the Rev. Mr. Taylor is now inclined to think savor a little of unfairness. When it is said that the executive is selected rather than elected, it must not be thought that the executive is a poor executive as it at present stands. It is perhaps as strong an executive as could be elected, and will no doubt do excellent work. And the teachers will simply have to be patient until they see what new election procedure an active member's foresight will produce for them at the next election.

The subject of civics is not altogether neglected in our schools, and the above reference to one of our many teachers' associations leads us to the consideration of the example that is in most cases better than precept. The question of how an executive should be elected is more important than the *personnel* of the executive, and the tampering with the constitution of an association for the sake of producing certain results is always followed by a disturbance to the good feeling in any society. It would perhaps be too much to say that the inventor of a new electioneering method is a disturber of the peace, but his inventions generally lead to the estimate of the unthinking that whatever issue has a majority in its favor must necessarily be right. And this is surely not the ethics our teachers propose to teach in school. A measure can only be right in itself, and no vote, however cunningly collated, can make the wrong way of doing things the right way of doing things. A vote too often only makes the worse appear the better reason, and we all know how our politicians can handle it as such even in a contest for or against prohibition. It is a pity, however, that the politician's canvassings and counter-canvassings should have any part in our various social organizations for the promotion of brotherly kindness and professional advancement. The politician has special methods of his own, as we are so often told, and he is a daring writer who would venture to interfere with them, or counsel a reformation. But they are none the less wrong in principle, and have never done anything for the good of society. They are not even the "evil done that good may come." And in our social organizations and professional guilds all indirect methods of maturing public opinion should be discountenanced as at least dishonorable. What has the right or wrong kind of philanthropy to do with a vote as an argument in its favor? The right kind of philanthropy is the true philanthropy, and no majority of votes can make it a pseudo-philanthropy. And are our teachers' associations not philanthropic institutions? If the teacher would therefore gain a practical knowledge of the civics he would teach, he must gain it in his associations with his fellows, in the social organizations to which he belongs, and not from the indirect methods of the politicians or of those who answer all argument by collating a vote or by organizing a caucus to vote as their leaders dictate.

The ethical reformer has almost as hard a road to travel as the policeman. The wrong-doer has never much love for the detective, nor even for his

would-be friend, the patient, unbiased adviser, and, in referring to this question of practical civics in the general, it is likely enough that we will be misunderstood. But we have no side to take in this matter save the right side. A teacher must first learn to vote before he can train young folks the right way to vote and understand the iniquity of the canvass as practised by many of our politicians. The promptings of the canvasser are as iniquitous as the promptings in the class-room. The pupil must think before he speaks, if he would speak sense, and the voter must think for himself before he can vote conscientiously and become a sound factor in the forming of a wholesome public opinion in a society or in a constituency. And this is a lesson which every teacher should be able to teach from the standpoint of his personal integrity, and when we have said this we have said all that we are going to say at present about any of our provincial associations, or of the indirect methods practised by some of their members when election time comes round. THE CANADA EDUCATIONAL MONTHLY is not a provincial periodical seeking to mix itself up in local differences of opinion. It is interested in the educational affairs of Montreal and the Province of Quebec, as it is interested in the educational affairs of Halifax and Nova Scotia, of Toronto and Ontario, or of any other city or province in the Dominion. In mentioning individuals in our pages we have not confined ourselves merely to laudatory remarks, and do not intend ever to do so. Some people think that laudation is their due whenever they take part in public affairs, and can command a vote behind which to hide away their lack of logic and self-seeking. But those who think so must not extend their way of thinking to THE EDUCATIONAL MONTHLY, which will suffer no personal aggrandizement to interfere with

its eager desire to advance the interests of our teachers, and protect them in their rights. Through their honest expression of opinion in our correspondence columns and elsewhere it is our purpose to promote the general educational advancement of the whole country, and we invite the co operation of all our teachers in the enterprise we have undertaken in their behalf.

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The death of the Rev. Dr. Cochrane, of Brantford, brings to a close the active career of one who, though not an educationist in the stricter meaning of that term, was a philanthropist who had always the kindest sympathy with educational movements in Brantford, and in connection with Presbyterian College work. His end was sudden in the midst of his activities, preparing, as he was, to attend a meeting of the Executive of the Pan-Presbyterian Council at St. Louis, and to further mature his favorite schemes in favor of the Home Mission. His monument remains to Brantford and to Canada in the Brantford Young Ladies' College, which he was instrumental in building. Though a Scotsman by birth, he was a true Canadian in feeling, as many of his writings show.

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There were in the paper lately read by Dr. E. C. Fields many observations which are of primary importance in connection with school work, and ought to be made known to teachers, parents, and all interested in the proper upbringing of children. The teaching profession, as he said, were waking up to their responsibility, and a certain proportion of the laity were doing the same. It was an undoubted fact that visual defects had increased during the last few years. It was evident to anyone who had given the matter attention that many cases were congenital, while others were acquired. But, be it either one or the other, it could be readily understood that an

existing defect might be aggravated, and a greater defect produced under certain conditions. The only point, however, in which his audience was interested was how far the schools were responsible for this, and what means might be adopted to lessen the evil. Other countries had recognized this fact—England, Germany, and certain of the States—and they had appointed expert inspectors, who regularly examined the children's eyes, and if these were found defective the parents were compelled to have them properly fitted with glasses. In San Francisco 33 per cent of the pupils in the schools had defective eyes; in New York the percentage was about the same; in Ontario, judging from his own experience, it was about one-quarter per cent., and in Montreal Mr. Parsons, of the Victoria school, who had examined the eyes of the kindergarten children, ranging from three to six years of age, had furnished him with data showing that those who had defective eyesight were one quarter per cent., and as you went into the higher classes it was found that the percentage slightly increased. Teachers in other schools here had informed him that the same state of affairs existed. The percentage was not so large in rural districts as in the larger cities and towns. The reason was obvious. Their conditions were entirely different; they enjoyed more healthy outdoor exercise, and their curriculum of study was not so heavy as a rule. Taking the whole, he thought an average of 30 per cent. was not too high an estimate of this defect. As regarded the causes with which they were principally concerned, there were two or three important ones; defective and improperly arranged light, bad print used in school books, and another, which, owing to the extended curriculum could not be altogether prevented, the long-continued study and close application required in order

to keep up with the class. The first two could be remedied by the authorities, and the evils of the latter might be relieved to a great extent by judicious means. The concensus of opinion was that the light should be made to fall on the left hand side of the pupils, and on one side only; but, if light must be admitted from both sides, it should not be east and west, but rather north and south. The windows should be as high as possible, the nearer the ceiling the better, and by no means should there be a light directly in front of the pupils. By means of diagrams Dr. Fields explained what is commonly known as longsight and shortsight, and he also referred to the means that might be adopted for detecting these defects. He strongly urged that, when it was noticed that a child had any difficulty in learning, it be not put down to stupidity or want of application, without first ascertaining if there was any defect in vision; and, if so, recommend the parent to have the matter attended to. By so doing teachers would have done their duty, and the true responsibility would rest elsewhere.

The report presented by Dr. Harper at the Convention of Teachers held last month in Montreal indicates the progress that is being made in the matter of improved professional training in the McGill Normal School, and recommends, first, that two short terms be provided for in that institution until all the teachers employed in the Protestant elementary schools of Quebec are trained teachers; second, that a period be fixed upon by the authorities when only trained teachers may be employed in such schools; and, third, that every facility, including pecuniary assistance, be granted to teachers who have taught for a given period of years in the province to take a course of training at the Normal School.

The McGill University is fast becoming our foremost investigating body, Professor Cox, of the Science Faculty, having led the way in the matter of the X rays, and the limit of their powers in locating foreign matter in things animate and inanimate. Now it is Dr. Walker, of the Chemistry Department, who has undertaken to make public the properties of argon and the manner in which other constituent gases of the atmosphere have lately been discovered by Professor Ramsay, of Great Britain. The following is taken from a report of a meeting lately held of the Science Society of Students, at which Dr. Walker explained the process of the marvellous discoveries made by Lord Rayleigh and Prof. Ramsay. Dr. Walker is now a member of the Faculty of Science of McGill, having lately been appointed Professor of Chemistry and as a colleague of Sir William Dawson's distinguished son-in-law, Dr. Harrington. "I have two reasons," Dr. Walker is reported as having said, "for choosing my subject for to-night as I have done, firstly, because it follows out the line of an address delivered in Canada a few months ago by Prof. Ramsay, and, secondly, because it is a purely chemical subject, and one of the greatest discoveries since Davy discovered the alkali metals. To properly understand the subject, it will be necessary to say a few words about the now well-known substance, argon. Lord Rayleigh prepared nitrogen from the atmosphere, and then from chemical sources. The result showed a slight discrepancy. The nitrogen obtained from the atmosphere was found to be denser than that obtained from chemical sources. Ramsay concluded that the nitrogen of the air must contain some unknown substance. They then set about to separate the nitrogen from this unknown substance. A vast amount of nitrogen was prepared from the atmosphere. As nitrogen readily

combines with magnesium, at red heat, this atmospheric nitrogen was passed over magnesium turnings, heated to redness, till the gas ceased to contract in volume. The residual gas was found to have a density of 20, and it showed an entirely new spectrum. Owing to its great chemical inactivity, the discoverer called it argon. This gas had been accidentally prepared by Cavendish eighty years before, but he did not notice that it was different from nitrogen, and paid no attention to it.

"Shortly afterwards Ramsay discovered the new gaseous elements, helium and argon, in some rare minerals, and from the position of argon and helium in the periodic system of the elements, he felt convinced that some other gases of a similar character must exist somewhere in nature. Accordingly these about the examination of all sorts of minerals, mineral waters, and the atmosphere, and finally found it in the argon of the atmosphere. Owing to the inertness of argon, it was useless to try to investigate it by chemical means, so he and his coadjutor, Mr. Travers, adopted the method known as practical distillation."

The latest gas discovered has been named "Neon" and, during the process of its discovery, two other substances were discovered in the residue, namely, metargon and crypton. The former has the same density as argon, but it is a white solid at the low temperature of boiling air, and shows an entirely different spectrum. Professor Schuster had pointed out that its spectrum is in many respects similar to what is known to physicists as the "carbon" spectrum, and suggests that metargon is really a carbon compound. But, as Prof. Ramsay and Mr. Travers have shown, if so, it must be an entirely new form of carbon compound, since it resists all attempts that have yet been made to



oxidize it to carbonic acid. The rate of its specific heats also show that it is of an elementary nature, and not a compound. These latter experiments were nearly all performed within a fortnight, and I must confess it was one of the most exciting fortnights I ever spent. Really four new elements in a fortnight is too great a rate of increase. Of the nature and scope of these new elements little has yet been determined, but the discoverers hope to soon be able to give more information on the subject, on which they are still working.

There are two institutions in Montreal which are leaving their impress on the city school system, taking rank as model schools in a community where the idea of inviting the public to examine for themselves the inner and practical organization of the school-room has not been very much encouraged. The teacher in training requires a well-organized model school in which to do his practising under careful supervision, but the public also requires a model school in which to learn to distinguish a right method of teaching from a pernicious method, and it is needless to say that every public school should be such a model school, open at all times to the public. Visiting day is an excellent idea, and should be fostered in city and country, even in face of the prejudice that too much may be made of it or too little. But there need be no halting at visiting day in providing for the model school which has its doors always open

to the public, and the High School of Montreal and Westmount Academy are examples of such model schools. No visitor is admitted to the classrooms of these institutions without permission, it is true, but no citizen ever goes away from a visit to either of them having the feeling that his visiting has been out of place, or that he has, by his presence, interrupted anybody's work. The principals of these institutions are gentlemen of progressive ideas, and through the co-operation of their efficient colleagues are gradually raising their schools to that degree of efficiency which has made the Boston schools the centre of attraction in America.

Our correspondent, "Montreal Teacher," informs us now and again how educational affairs are prospering in the commercial metropolis, and it would be well if more of our readers would follow his example. The identity of a correspondent cannot but have an interest attached to it, and this interest becomes all the more intense perhaps when the correspondence indulged in has for its object the giving of the information that is a protection to those who would do right and do it openly. This identity, however, is a sacred thing in the eyes of the editor, and our correspondents may safely make use of *THE EDUCATIONAL MONTHLY* as if it were their own property, when the use they make of it is a wise one and in the public interest.

#### CURRENT EVENTS.

When some of our cousins in the United States of America began talking about a monument to General Montgomery, who was killed in the attempt to take Quebec on the last night of 1775, scarcely any one in Canada took the matter seriously.

The proposal appeared to Canadians so supremely improper that they never imagined that any sane person would entertain such an absurd idea. We heartily agree with the following :

The U.E. Loyalists, at their meeting at the Normal School yesterday after-

noon, entered a vigorous protest against the proposal to erect a statue in Quebec to General Montgomery. The matter was brought before them by Mrs. Forsyth Grant, of the Women's Canadian Historical Society of Toronto, which, at its last meeting, by a standing vote, and amid much enthusiasm, passed the following resolution :

*Resolved*, That whereas an "international monument is proposed to be erected in the public square at Quebec," we do hereby enter a protest against such act being allowed, and do further appoint a committee to confer with the other historical societies in the matter.

The following is the protest : That the said General Richard Montgomery, having served under Major-General Wolfe at the taking of Quebec, on September 13, 1759, did later use the knowledge then obtained, and while serving under the British flag, to lead an invading army into Canada, and fell, assaulting Quebec. Therefore, to permit the erection of an "international monument," or one of any character, to do honor to the invader, would be at once an insult to the memory of the men who defended it and to the feelings of their loyal descendants, and would also in the future confuse the minds of the children as to the duty they owe to their country. Also, it is without precedent that a people, or a city, or a Government should permit the erection of a monument within its borders to glorify an invader. And your petitioners would further suggest that, if it be desired to honor the heroes of that period of our history, the city of Quebec should be enriched with a monument to Sir Guy Carleton, who defended her, or to the gallant Beaujeu, who raised a force to drive out the invading army, and whose loyalty and devotion remain unrecognized. We, therefore, pray your Government to

take this matter into your consideration, in order that the necessary steps may be taken to prevent what would be an outrage on the patriotic feelings of your people.

The reading of the above was followed by the passing of the following resolution, moved by Mrs. Forsyth Grant, seconded by Mr. Land : That this association do endorse the resolution passed by the Women's Canadian Historical Society with reference to the proposed erection of a monument to Montgomery ; that a committee be ordered to draw up a similar protest, and that the secretary be instructed to send a copy of it to the other U. E. Loyalists' Associations in Canada, and request similar action.

A curious case has occurred in England in which a schoolmaster was taken into court by an irate parent over the absence from school of an idle boy with an excuse from the parent. There is not a teacher in the land who has not had dealings with the school-room specimen. The boy was punished for his conduct in face of the excuse, and this is the report of the case as given in the *Journal of Education* :

"The Sheldon v. Gull case has received a fresh development since we commented on it two months ago. As the magistrate had refused to grant a summons, Mr. Gull was sued in the county court for damages. It will be remembered that the boy was absent from school with his father's permission. When he returned and presented his note of excuse he was caned—not for absence without leave, but because his absence brought before the headmaster's notice the fact that he was idle and neglected his work. This was Mr. Gull's case, and the judge summed up in support of it ; but the jury decided that the boy 'was caned for his absence, and not for his dullness,' and awarded nominal damages.

The case is of interest to schoolmasters, and it may seem monstrous to them that a jury should be asked to decide the grounds on which the punishment is given. A parent may punish his child 'reasonably,' and his power is admitted to be handed over to the schoolmaster. But, if the child breaks a school rule under his parent's orders, the only admissible penalty seems to be dismissal. We must add that the punishment was not stated to be excessive."

The popularity-prize craze has assumed a new form. This time it is not the most popular policeman or electric car conductor or clergyman or school teacher that is wanted, but the most popular school-boy, and it is a member of parliament of an English county and a mayor of an English city that is after him. These gentlemen have been distributing watches and watch-chains throughout their constituencies to the most popular boys whom their *discerning* neighbors may select, and the editor of the *Journal of Education* is rightly up in arms against the practice: A boy should grow up, as he says, gentle, kind, and helpful to his schoolfellows; but, when we think of the burden that is put upon the half dozen boys who are in the running for the prize, when we realize the development of their self-consciousness and the temptations to hypocrisy, we can only hope that our headmasters will be strong enough to refuse absolutely and entirely the offer of such prizes.

Like the Hon. Dr. Ross, when he compared the convention of Montreal Teachers to the Legislature at the moment preceding a division, Mr. Maughan lately said, in an address delivered at a dinner given to Sir Langdon Boynton by the Adelaide Teachers' Association:

"As a whole the teachers were not of political tendencies, partly because they were too much taken up with little parliaments of their own, where the Government had long tenures of office, and where the Opposition had no chance of moving a successful want of confidence motion. (Laughter.) But they were no less patriotic for that, and they were proud of their Parliament for the position it had taken in passing Liberal legislation, and for the dignity and intelligence with which its deliberations were conducted."

The people of England are growing anxious over the technical school question, and have been sending deputations to Germany and also to America to note the various aspects of the technical school here. Mr. Reynolds, the deputy sent to America, has been to McGill and Toronto, and others of the large cities of the continent, and from what he says it is America, rather than Germany, which will successfully compete with this country for supremacy in the engineering industry. Mr. Reynolds shows that in the United States and Canada the training given in technical schools is held in the highest esteem by employers. "In visiting various important works, it was gratifying to observe the esteem in which the engineering colleges are held by the best class of employers. Many of their most important officials come from these colleges, and preference, other qualifications being fulfilled, is given to such technically trained candidates. In short, it would appear that the exact investigations carried on in the great laboratories of the chief engineering colleges, and the importance of the results derived therefrom, have led to a recognition of their value and necessity in the workshop itself, with the result that those who have been trained in them are receiving corresponding appreciation."

In the course of his address on the "Child-Mind," Dr. Murray claimed, according to *The Herald* report, that education was after all the education of the will, which was dependent on the intelligence and feeling with which it was associated. Will divorced from these was merely blind, unfeeling force, exhibited in the harshness of nature of many men. The highest education was closely connected with the highest emotion, religious feeling, and therefore he felt deep sympathy with those who sought for religious instruction in schools. In dealing with difficulties with which teachers had to cope, Dr. Murray pointed out that they had to begin with directing muscular action into right channels. The tendency of nervous and muscular vibrations was to widely diffuse themselves, as shown, for example, in the lolling tongue with which many children followed the movements of their pen. Hence more energy was used up than was required, and the teacher had to try to prevent this. The direction of the will depended on the feelings of pain or pleasure, and the teacher who could arouse that attraction in study known as interest had attained a great deal. The emotional feeling varied in different persons from stoicism to mere sentimentalism. The teacher had to develop the emotional nature where it was weak and repress it where it was strong. This led to the question: What form of educational discipline best developed the will? Many educationists fell into the error of supposing that there was a royal road to learning. The idea that anything worth learning could be learned without dogged, continual endeavor was a delusion and a snare. If learning could be obtained without labor it would be valueless, because it would fail to develop the intellectual and emotional energies, the energies of the will which formed the great aim of education. The discipline needed was

one which would develop the habit of voluntary action, of instantly saying yes or no when duty prompted or wrong tempted. The training of sustained attention was important, and of accurate observation and reasoning. What did present educational systems supply in the way of this necessary discipline? It must be said that these systems gave far too exclusive prominence to the development of the intelligence, to the attainment of mere knowledge; that there was almost no specific discipline adopted for the purpose of training will power, at least the disciplines with that object in view were not so numerous and prominent in educational systems as those which aimed at giving knowledge and training the intellectual powers. Public schools offered a valuable discipline in the training of punctuality, which should also be enforced at home; and the schooling of oneself to like a duty should not be overlooked. The wreck of lives was nearly always due to the failure to early develop the will, the victims of tragedies being unable to say "no" or to say "yes" at the right moment.

The Hon. Boucher de la Bruere, Superintendent of Public Instruction, has just issued a circular, addressed to heads of universities, colleges, normal schools, high schools, academies and other higher educational institutions. Portion of the circular is as follows:

"I have the honor to announce to you that the Province of Quebec will take part in the Paris Universal Exhibition of 1900, and the Government desires that the Department of Education should adopt measures suitable for instructing the world as to our school system and its working.

"I believe it my duty, then, to request the aid of all educational establishments. We are only one school year from the time at which exhibits must be forwarded. I have no doubt

of your cordial support in assuring the success of this exhibit, in view of the importance of appearing with advantage in this universal competition, and of making known the working of our school law and the results achieved by our educational institutions.

"I have only to recall the great exhibitions of Paris, London and Chicago to be satisfied that by combined effort we may in 1900 prove ourselves worthy of the flattering marks already bestowed upon us, and win new encouragement to promote the progress of instruction among us.

"The higher educational establishments, I think, should review their history, state how their teaching staff is made up, and give the number of pupils attending. They will also mention their branch establishments, even those outside the province. Photographs of the buildings, interior and exterior, might be included among the exhibits.

"I need not remark that it is important to have our works judged in their *ensemble*. Our higher educational houses will collect specimens illustrating the excellence of their courses of study, such as philosophic dissertations, scientific compositions, Greek and Latin theses, literary productions, etc.

"I shall ask the convents and other girls' schools to furnish specimens of pupils' needle-work, embroidery, etc."

The death of Dr. William Kingsford, the historian of Canada, brings pause to a life-work which coming generations of Canadians may study with more keenness than the Canadians of to-day. His ten volumes of Canadian history form a crowning glory to a long career of usefulness in other spheres of labor than the literary, though the literary spirit must have been present in his work. George Eliot used to say that the possibility of living a long life without leaving a

footprint behind as a permanent memorial was always an injury to the man or woman who had within them the throbbing of genius. The faithful worker in behalf of posterity must feel at times the same agony, and it is pleasant to think that Dr. Kingsford, whose literary industry and faithfulness have long been recognized, had for years the satisfaction that his work would live after him. To the teacher Dr. Kingsford has been a true friend—to the teacher of the present and the past—and it may help us to appreciate his industry all the more, to read of his earlier career as an unobtrusive citizen, laboring for his bread and butter, when public recognition had not yet come to him. It is a long and weary road to the goal of fame, and even yet Dr. Kingsford's work has escaped the attention of Canadian readers in the hurry and bustle of our modern ways of looking at literary talent. Kingsford's History is an example of how little of the pecuniary reward there is in the task of the Canadian literary man. It was not without difficulty that a publisher could be found to take hold of his great work, and the number of subscribers, even after full recognition has been given by the critics to the excellence of his volumes, is phenomenally small. When will Canada turn the corner in this matter of literary appreciation of her sons' and daughters' literary gifts? Britain was once called a nation of shopkeepers, but Canada may well be called a nation of newspaper readers, and publishers and authors may write as they may about copyright and the legislative evils that lie in the way of a Canadian author earning an honest livelihood through the efforts of his pen, but as long as the present literary apathy of the people prevails, the author will have to look for "ways and means" in a direction away from the publishers' till. The following is an account of Dr. Kingsford's career,

which may be found in fuller form in any of the volumes of biographies lately published :

William Kingsford, C.E., LL.D., was born in London, England, December, 1819. He was educated in his native place and came to Canada with the 1st Dragoon Guards. Retiring from the service in 1841 he entered the employ of the city surveyor, Montreal, and was connected with that department for some years. At this period of his life he went to the United States where he assisted in the construction of the Hudson River Railway and went subsequently to Panama, where he was engaged in laying the line of the Panama Railway. Returning to Canada he was employed to make surveys on various parts of the Grand Trunk line, after which he held for a short time the position of chief engineer of the city of Toronto, and again entered the employ of the Grand

Trunk Railway. After a period of six years spent in Europe, during which time his professional services were largely in demand, he returned to Canada and was again employed by the Canadian Government. In 1880 he entered the services of the Canadian Pacific Railway, and was connected with this company for some time. Possessed of strong literary ability he has written much on historical subjects, and is the author of an extensive "History of Canada," from the time of its early settlement up till 1841, the date of the union of Upper and Lower Canada. Among his other works are "The Canadian Canals, their History and Cost"; "The Earliest Bibliography of Canada"; and "Impressions of the West and South." He received the degree of LL.D. from Queen's and Dalhousie Universities, and was a Fellow of the Royal Society of Canada.

#### MAGAZINE AND BOOK REVIEWS.

Many biographies in the past have appeared in the *Atlantic Monthly*. Of late years distinguished people have contributed the story of their own lives, and of these few could be more interesting than The Autobiography of a Revolutionist, by Prince Kropotkin. It has also been announced that Mrs. Julia Ward Howe's Reminiscences will be begun in the November number. Prof. William James, of Harvard, will shortly contribute a series of six papers dealing with the relation of Psychology to the Art and Practice of Teaching.

The October *Book Buyer* contains, along with other interesting matter, "Some Recollections of Aubrey Beardsley," by Penrhyn Stanlaws. Mr. Stanlaws appears to be one of the very few people who ever saw Beardsley at work. There is much that is pathetic in the recollection of that

singular artist's short and apparently almost futile life.

With a certain amount of gratitude one finds the October *Century* almost free from the late war. Chester Bailey Fernald, it is true, contributes a tale of war correspondents, entitled "The Yellow Burgee," which might be supposed to have wrecked his future if war correspondents are as powerful as they appear to be in the United States; but the Oxford and Cambridge race is as far from the tendency of conflict as possible. Prof. Wheeler, of Cornell, is to begin a life of Alexander the Great in the November issue.

*Littell's Living Age* for October 15th contains a most interesting review of Helbeck of Bannisdale, from a Catholic standpoint, taken from the *Nineteenth Century*. It surely will be a matter of regret to many of the readers of this weekly that the page of

poetry where, in the past, so many excellent things were reprinted, has been discontinued.

*The Ladies' Home Journal* for November contains the opening chapters of Mary E. Wilkins' new serial, "The Jamesons in the Country." "The Girls of Camp Arcady" is the name of another continued story which deals with the adventures of four girls who earn their living and share a flat in New York. A Polish Fantasy gives an account of the early life of Paderewski.

The Copp, Clark Company has recently issued an attractive edition of "John Splendid," a stirring tale of the highlands of Scotland, by Neil Munro. This story, which last year ran as a serial in *Blackwood's Magazine*, is a romantic and wholesome piece of literature. It belongs to the same class as Mr. MacLennan's "Spanish John," and appeals particularly to those who belong to a Celtic derivation. From the same firm we have this month received: "Stories of the Maple Land; Tales of the Early Days of Canada, for Children," by Katherine A. Young. "The Primary Public School Arithmetic," by J. A. McLellan, A.M., and A. F. Ames, A.B. And "High School Cadet Drill Manual," arranged by W. Bennett Munro. "Poet's Walk; an Introduction to English Poetry," chosen and arranged by Mowbray Morris; Macmillan & Co., London. This volume is issued in the Golden Treasury series, and merits a place beside the excellent and long-known "Golden Treasury of Songs and Lyrics." There are a number of selections which do not appear in the songs and lyrics, notably those from Sir Francis Hastings Doyle, whose "Return of the

Guards," July 9th, 1856, might well have been written for to-day, and compels enthusiasm.

Books received from Macmillan & Company through their Toronto agents, The Copp, Clark Company:

"Cæsar's Gallic War, VI," edited by C. Calbeck; "Exercises on the First Book of Euclid," by William Weeks; "The First Oration of Cicero Against Catilina," edited by G. H. Hall; "Historical English and Derivation," by J. C. Nesfield.

Books received from the University Press, Cambridge:

"The Æneid of Virgil, Book I.," edited by A. Sidgwick; "Cicero in Catilinam," edited by J. H. Fether; "John Bunyan by Macaulay," edited by Arthur D. Innes; "Milton's Comus and Lycidas," edited by A. W. Verity; "Gray's Ode on the Spring and The Bard," edited by W. C. Tooley.

Books received from Ginn & Co. Boston:

"The Elements of Physics," by A. P. Gage; "Essentials of Psychology," by C. S. Buell; "Goethe's Egmont," edited by Max Winkler; "The Alcestis of Euripides," edited by H. W. Hayley; "Seed-Travellers," by C. M. Weed.

Books received from The American Book Company, New York:

"Selections from the works of Richter," edited by G. S. Collins; "Elements of Grammar and Composition," by E. O. Lyte; "Elementary English," by E. O. Lyte.

William Briggs, Toronto:

"An Elementary Treatise on Arithmetic," by Wilson Taylor.  
The Editor Publishing Company, Cincinnati:

"Meadowhurst Children and Other Tales," by E. L. MacNaughton.

ALGEBRA. FORM III., 1898.

C. P. MUCKLE, B.A.

$$1. (a) \frac{\frac{z}{\frac{1}{x} - \frac{1}{y}} + \frac{y}{1 - \frac{y}{x}} - \frac{x}{1 - \frac{x}{y}}}{\frac{1}{x} - \frac{1}{y}} = \frac{xy}{y-x} + \frac{xy}{x-y} - \frac{xy}{y-x}$$

$$= \frac{xyz}{y-x} - \frac{2xy}{y-x} = \frac{xy(z-2)}{y-x} \text{ or } \frac{xy(2-z)}{x-y}$$

$$(b) \frac{1}{1-x} + \frac{1}{1+x} + \frac{2}{1+x^2} + \frac{4}{1+x^4} = \frac{2}{1-x^2} + \frac{2}{1+x^2} + \frac{4}{1+x^4}$$

$$= \frac{4}{1-x^4} + \frac{4}{1+x^4} = \frac{8}{(1-x^4)(1+x^4)} = \frac{8}{(1-x^8)}$$

2. Since  $x^2 = x - 1$ ,  $x^2 - x + 1 = 0$ ;  $\therefore x^3 + 1 = 0$ , being = to  $(x+1)(x^2 - x + 1)$ .  
 Now,  $x^6 - 3x^5 + 2x^4 - x^3 - 3x^2 + 2x - 2 = x^6 - 1 - 3x^5 - 3x^2 + 2x^4 + 2x - x^3 - 1$   
 $= (x^3 - 1)(x^3 + 1) - 3x^2(x^3 + 1) + 2x(x^3 + 1) - (x^3 + 1) = 0$ .

Or, substituting  $x^6 = (x^3)^2 = x - 1^3$ , etc., reduce the expression.

$$3. (a) (a^2 + b^2 - c^2)^2 - 4(ab)^2 = (a^2 + b^2 - c^2 + 2ab)(a^2 + b^2 - c^2 - 2ab)$$

$$= (a+b+c)(a+b-c)(a-b+c)(a-b-c)$$

$$(b) x^6 + x^3 - x^2 - 1 = x^3(x^2 + 1) - (x^2 + 1) = (x^2 + 1)(x^3 - 1)$$

$$= (x + \sqrt{-1})(x - \sqrt{-1})(x - 1)(x^2 + x + 1)$$

$$= (x + \sqrt{-1})(x - \sqrt{-1})(x - 1) \left( x + \frac{1 - \sqrt{-3}}{2} \right) \left( x + \frac{1 + \sqrt{-3}}{2} \right)$$

$$(c) 2x^2 - y^2 - 2z^2 + 3yz - xy = (2x + y - z)(x - y + 2z)$$

4.  $i^3 = i \cdot i^2 = -i$ ;  $i^5 = i \cdot i^4 = +i$ , etc.

$\therefore (1+i)(1+i^3) \dots$  to  $n$  factors  $= (1+i)(1-i)(1+i)(1-i) \dots$  to  $n$  factors

$$= \{ (1+i)(1-i) \}^{\frac{n}{2}} = 2^{\frac{n}{2}} = (\sqrt{2})^n$$

5. Assuming that  $(+a) \times (+b)$  is  $+ab$ , or  $+a$  taken  $b$  times additively, then  $(-a) \times (+b)$  must be equal  $(-a)$  taken  $b$  times additively

$$= (-a) + (-a) + \dots \text{ to } b \text{ terms} = b(-a) = -ab$$

And  $(-a) \times (-b)$  must be  $(-a)$  taken  $b$  times subtractively or  $-(-a) - (-a) \dots$  to  $b$  terms, or  $-(-ab) = +ab$ .

6. (a) and (b) Book-work.

$$(c) \begin{array}{r|l} \begin{array}{l} 1 \\ 1 \\ 1 \\ +7z \end{array} & \begin{array}{l} 1 + 6z + 10z^2 - 2z^3 - 15z^4 \\ 1 + 5z + z^2 - 13z^3 + 6z^4 \\ z(1 + 9z + 11z^2 - 21z^3) \\ 1 + 2z - 3z^2 \\ \hline 7z + 14z^2 - 21z^3 \\ 7z + 14z^2 - 21z^3 \end{array} & \begin{array}{l} 1 + 5z + z^2 - 13z^3 + 6z^4 \\ 1 + 9z + 11z^2 - 21z^3 \\ -4z - 10z^2 + 8z^3 + 6z^4 \\ -4z - 36z^2 - 44z^3 + 84z^4 \\ \hline 26z^2(1 + 2z - 3z^2) \end{array} \end{array} - 4z$$

7. Let  $7x = A$ 's money,  $8x = B$ 's money.  $\therefore \frac{7x + 18}{8x + 18} = \frac{17}{19}$

$$x(7 \cdot 19 - 8 \cdot 17) = 18 \cdot 17 - 19 \cdot 18 = 18(17 - 19) = -36$$

$$-3x = -36, x = 12; 7x = 84 = A$$
's money,  $8x = 96 = B$ 's money.



## ASTRONOMICAL NOTES.

The discovery of a new member of the asteroid group is becoming quite a common occurrence, but the last announcement of the kind calls attention, rather to a new planet than simply to another of the bodies revolving in the zone between Mars and Jupiter. The institution known as the *Urania*, of Berlin, has the honor this time, and Herr Witt the special credit of having first observed the stranger. He allowed a whole month to pass before making his discovery public, for the reason that the observations, upon analysis, gave an orbit which seemed unlikely to be the correct one; it appeared to lie actually within the orbit of Mars, though not wholly. In terms of the astronomical unit, the earth's mean distance, the stranger when at perihelion is 1.13 from the sun, and at aphelion is 1.79. The latter is farther away than the aphelion of Mars' orbit. This discovery will be of immense value to the mathematical astronomer, when the path of the new planet is accurately marked out, and will lead to closer determination of the sun's mean distance than has hitherto been thought possible.

Mars is now in good position for observation, rising about 10 o'clock, and a conspicuous object among the stars of Cancer. The disc of the planet towards the end of November is 12 seconds in diameter; this is larger than Mercury ever appears to us, and when it is remembered that drawings of Mercury have been made on many occasions we are prepared to hear that Mars has already, this season, become a subject for the artist at the telescope. We do not possess any photographs of the surface of Mars which could be said to aid us in the study of the planet. This field is open indeed to all.

Jupiter having now passed to the west of the sun, is morning star, and towards the end of the month is far enough out of the sun's rays to permit of the satellites being observed. Saturn is now too close to the sun for

observation. Venus also is rapidly approaching the sun, crossing the direct line on November 29th, about 7 degrees south. On this occasion Venus crosses the meridian twice within the same astronomical day. Mercury reaches the greatest elongation east of the sun on December 3rd, but, being far south in declination, will not be favorably placed for observation.

Observers of the stellar heavens will note that we now have the Pleiades group culminating on the meridian about midnight, and it is not to be forgotten that the feast of "All Souls," our now almost prosaic Hallowe'en, is associated with this phenomenon. It is a long step from matter-of-fact gala times of the present day to ancient festivals. Yet the connection is there, and as there appears to be no race without some tradition in connection with the Pleiades, it is open for explanation why this is so. A very fanciful idea is that the "lost Atlantis" was submerged when the Pleiades culminated at midnight, and hence the group would always mark the date of the anniversary.

Observers of the moon may note that on the evening of November 28th there will be an opportunity to observe most satisfactorily the great ring plains on the west limb. About a day past the full the lunar plain Petavius presents a beautiful appearance, the convex floor lit up by the sun, while the western wall is partly broken. It is a beautiful object for the pencil at the telescope. THOS. LINDSAY.

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