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THE CANADA
EDUCATIONAL MONTHLY
AND SCHOOL MAGAZINE.

NOVEMBER, 1882.

PROFESSOR MARSHALL'S INSTALLATION ADDRESS ON
PHYSICS AT QUEEN'S UNIVERSITY.

WHEN I was asked, after my appointment to the Chair of Physics in this University, to deliver the opening address for the current session it became a matter of anxiety to me what sort of passage we should have across the Atlantic. Without a consulting library within reach it would add, I feared, considerably to the difficulty of the situation had I not a steady table even on which to write. But a promise once made must be fulfilled. My former, though slight, acquaintance with our fellow-countrymen on this side of the Atlantic made me feel that I would have a generous, if not an indulgent, audience, and with such a Principal as we have I believed at least every allowance would be made for the circumstances in which I am here now to address you. I propose, on the present occasion, to say a few words on what I believe to be the province of physics as taught in schools of science at the present day, and thereafter to make

some remarks on my own experience in teaching that subject to a people who may be said to have been entirely ignorant of it but a quarter of a century ago. Physics, which is the subject I shall have the honour to teach in this University, if taken in its literal sense, would treat of all the phenomena and their relations to one another, with their connecting laws, which take place in the material world. Natural philosophy, the older and yet much cherished name of the same subject, has a similar meaning. But as our knowledge of the material universe has grown, one branch after another, like the branches of the banyan tree, has taken root for itself and grown a tree alongside the mother stem. Medicine, which in its various parts treats of a knowledge of living animals, and especially man, and the relations they bear to the material world outside them, has long ago separated itself. In the same way Botany, which unfolds to us the won-

ders of the vegetable kingdom; Geology, which treats of the crust of our own globe, and tells us of its various changes in the past; Chemistry, which analyzes for us the various kinds of matter and repeats the old lesson that we are but dust; and Astronomy, which revels in the starry sphere around us, have all grown such vast subjects both in the amount of knowledge they embrace and in the importance of their practical applications that each can well command the almost undivided attention of its votaries. As such important branches of the parent stem have one by one taken root for themselves, it becomes difficult to define exactly the field which is now investigated under the name of physics. A definition, perhaps, which, as well as any other can convey to us an idea of what we mean by the term in modern times is this: Physics is the science of energy. By energy we mean capacity to do work. Work, let me remark, in the scientific sense does not mean only useful work, which it does in a popular sense. When a boy *e.g.* throws a stone and breaks a pane of glass, or when a boiler explodes, it will be taught in the class of physics that work has been done in either case, although in another class-room the same phenomena might come under the term mischief rather than work. By work in a scientific sense we mean the overcoming of resistance through space, and the amount of work done is measured conjointly by the amount of resistance overcome and the distance through which it is overcome. The above definition of physics has been suggested by the comparatively recent discovery of the great foundation of modern physics, viz., the Conservation of Energy. Perhaps no law, not even excepting the great law of universal gravitation, has been richer in results than this important generalization. The conservation of energy is that principle which asserts that the

total energy in the universe is a constant quantity, and the various changes which go on around us are merely transformations of one form of energy into another. The no less important principle of the indestructibility of mass, which forms the foundation of modern chemistry, has, in like manner, taught us that however great and many are the changes in the forms and other properties of matter which are constantly taking place, there is one great law to which all such changes are subservient, viz., that the total mass remains unchanged. To make what is meant by the Conservation of Energy a little clearer to you, allow me to take a particular case. Heat, you are aware, inasmuch as it possesses the capacity of driving engines and through them of doing work of various kinds, such as transporting us over land or ocean, is a form of energy. Now our principal source of heat is the sun, and however paradoxical it may appear to you at first sight, I can show you that it is really the heat of the sun that drives our boats across the ocean, whether they be driven by wind or steam. Without considering what becomes of all the heat of the sun you will readily admit that a portion of it comes to our globe. This portion is used in different ways. Part goes to heat the earth's surface, and thence to a great extent is radiated into space. Another part evaporates the waters of the earth, which rise in the form of steam and thereafter condense in the forms of clouds which again fall as rain to form rivers to be borne again to the ocean. Another part is spent in heating the atmosphere around us, and the unequal heating in different parts of our globe is the principal cause of the winds which drive our sailing vessels across the seas. This is a transformation, then, of the energy of heat into that of the visible motion of matter, or, as it is

technically called, visible kinetic energy. Presently I shall show you that this visible energy is retransformed into heat. Another part of the sun's heat enables the vegetable world to break up the carbonic acid in our atmosphere into its elements carbon and oxygen, the carbon going to feed the plant, the oxygen the animal. At this stage the energy of the sun's heat is said to be transformed into what may be called the potential energy of chemical separation, inasmuch as we can get back again the energy in an active state by the recombination of the carbon and oxygen we have just separated. The plant fed by the carbon, after long ages of decay, becomes coal, and in this form we use it to give us back again the heat of the sun to form steam and drive our steamships.

But, granted that the boat driven either by wind or steam, has really been driven by the heat of the sun, what becomes of the energy *then*, you will naturally ask, if it be indestructible. The resistance to be overcome in driving a boat is principally the friction between the boat and the water, and in overcoming this the energy employed is converted into heat, and this is spent principally in heating the water and thereafter diffused through space. To take another example, let me explain to you how it is that the sun supplies the inhabitants of Montreal with *running* water in their houses. In the way explained above, the sun's heat is transformed into the potential energy of uncombined coal and oxygen, then retransformed into the heat which drives the engines, which work the pumps, which raise the water to the reservoirs on the mountain. At this stage the energy is in the form of the potential energy of a *head of water*. When in any house the water is turned on we have a transformation of part of this potential energy into the *active* form

of running water. By friction and concussion it is again retransformed into heat to be diffused through the earth and thereafter dissipated in space, though not destroyed. We may learn another lesson from these two examples I have chosen of the *transformation of energy*, viz., that to the sun we owe many, if not all, the comforts of life. It is indeed the medium which the Great Creator has set in his heavens to give us life itself; and surely we ought to feel pity rather than contempt for those nations who have not yet been taught by a higher power to look from the thing made to the maker, and who worship the ruler of the day. If they cannot express, they at least have instinctively imbibed, the lesson that life on earth is but a part of that bright orb, as in the examples I have just given we can trace more or less perfectly the various changes which any portion of energy passes through, and satisfy ourselves that no portion is destroyed. Our conviction, however, of the truth of this law, as of all the laws of nature is derived more from the fact that when we use it as a foundation on which to build, we invariably find that deductions from it are in consonance with what we see to be the course of nature. It is indeed only on the foundation of the indestructibility of mass that researches in quantitative chemical analysis can be made, and the indestructibility of energy is the principle which has led to the immense strides which have been made in the investigation of nature within the last half century.

In the examples above given of energy being transformed from one form to another we have left it finally in the state of heat diffused through space. In this form, though not destroyed, it is in a state which prevents us from making further use of it, *i.e.*, for doing useful work for the purposes of man. They are particular cases of

another of the great generalizations of modern times. Whilst energy cannot be destroyed, in every transformation which takes place there is always some energy degraded from a higher to a lower form, and this process of degradation will go on until the total energy in the universe is in the form of uniformly diffused heat, after which no further transformation can be made. This principle is known as the dissipation, or better as the degradation of energy.

The principal divisions of our subject are dynamics or the science of force, heat, light, sound, electricity and magnetism. Under the term dynamics we treat of what may be called the forms of visible energy, such, *e.g.*, as the energy of motion of a projectile or other moving mass, (take that of a ball projected from the cannon's mouth, the destructive effects of which are too well known); of the energy of position of a head of water, (a fine example of this is seen at Lake of the Mountain where the energy of position of a fine head of water is taken advantage of by the proprietor, Mr. Wilson, to drive his machinery by means of turbine wheels to which the power is directly led); of the energy of a mass of compressed air or other gas (it is only necessary to mention the power of doing work contained in the compressed steam in a boiler.) Under the head of dynamics we might also include those more recondite forces known as the molecular forces, adhesion, crystalline force, diffusive force etc.; whilst under heat, light, sound, electricity, and magnetism are discussed the various forms of invisible energy. To enumerate in detail the various advances made in these several parts of our subject in modern times would in the circumstances be to me an impossible task. A few words may, however, be not uninteresting. In dynamics there is, perhaps, nothing since the publication of

Newton's Principia, which has so much stimulated the study of the science of dynamics as the well-known work of two Scotch Professors—Thomson and Tait's Natural Philosophy. Almost every book on dynamics which has appeared since that work has been influenced by it. The advances made in this subject are more or less of a mathematical character, and as such are of the greatest importance in their applications. In the science of heat not only have important advances been made in our knowledge of the nature of heat, and wrong theories given up, but laws and data of the greatest practical importance have been discovered. Chief amongst the latter is the determination of the mechanical equivalent of heat. It is indeed a triumph of science to be able to say that the heat required to raise the temperature of a pound of water by 1° C. would, if properly applied, be able to overcome the weight of the same water through a distance of 420 feet, or that if the same water were allowed to fall in vacuo through the same height and all its energy of motion used to heat it, that its temperature would be increased by 1° C. It may interest you to know a physical fact of some importance which comes under the subject of heat, and which only within the last year has been proved in the physical laboratory of the University of Edinburgh. To the inhabitants of a land of snow and ice like this it is probably well-known that the freezing point of water or melting point of ice is lowered by pressure, a fact predicted from theory more than thirty years ago. That if water *e.g.* were subjected to a pressure of 133 atmospheres instead of 1, as it is under ordinary circumstances, its freezing point instead of being 0° C. would be -1° C. *i.e.*, 1 degree below the ordinary freezing point. It is this lowering of the freezing point under pressure which explains to us the

gradual but ever onward flow of glaciers; and the same fact explains to us how snow when it has just fallen and a sleigh or heavy cart passes over it, the portions compressed are converted into ice. When the sleigh or cart presses on the snow the latter is partially melted because the melting point is lowered, but as soon as the pressure is removed, the water just formed is again frozen as ice. This, of course, would not take place if the snow were originally at a temperature considerably below the ordinary freezing point. In the case of water another interesting temperature is its maximum density point, which under the ordinary atmospheric pressure is 4°C . It is this remarkable property of water, of having a maximum density above the freezing point, taken along with the bad thermal conductivity of ice, which explains to us how the bottoms of rivers and lakes are seldom frozen, even after a long winter—a remarkable provision of nature for the preservation of the lives of fishes during winter. Now it has within the current year been proved in Professor Tait's laboratory in Edinburgh University that the maximum density point of water, as I have just said, has been known for over a quarter of a century to be the case with the freezing point, is *lowered by pressure*, and to the extent (so far as I at present remember) of $2^{\circ}\ 5\ \text{C}$. for a pressure of 1 ton weight per square inch, or 150 atmospheres. The subject of light supplies us with a fine example of how the greatest geniuses may be made to support a false theory. Sir Isaac Newton was a supporter of the corpuscular or material theory of light. After the complete establishment of the Wave theory, and the brilliant predictions which were made from it, and afterwards verified, to the extent even of producing darkness from light, we might have thought that our knowledge of light would be completed by it. Who amongst the early sup-

porters of the undulatory theory could have imagined that by its own light the sun would tell us of what it is formed? It required a Newton to teach us how to measure the mass of the sun; in the present century we have learned of what that mass is made. Is it not a lesson ennobling, and raising us far above the sordid pleasures of life, which teaches us to look on the great Ruler of the Day and learn what are its motions, to measure as with a rule its distance from us and its size, to weigh as in a balance its mass, and like a chemist in his laboratory even to tell of what it is formed? I wouldn't exchange such knowledge for the wealth of a millionaire. And, if we take a view of the practical side of science, is it the diggers of gold, or searchers of diamonds, or hunters after wealth that have given us the material comforts of our modern homes, that have taught us in such luxuriance fearlessly to cross the restless ocean, that bring us in such comfort to view the beautiful places of earth, that enable us to look with admiration rather than fear on the less common phenomena of nature, be they comets, eclipses, lightnings or thunder, or have by electric speech brought men so near to one another that they cannot but feel that they are all children of one beneficent Father?

In the science of sound it will suffice to mention the name of the great German Philosopher Helmholtz to remind ourselves that researches of the most important kind have but recently been made in this branch of physics. Amongst the many interesting instruments invented for the better understanding of the nature of sound this side of the Atlantic can claim the phonograph, an instrument which, like the radiometer, if it be not yet of much practical importance, reveals to us points of the greatest theoretical interest.

To give the great modern discov-

eries in electrical science would be to give the history of electricity. So rapid has been the development of this branch of science, especially in its practical applications to telegraphy and electric lighting that a new profession has been created—that of telegraph engineering. The name of Sir William Thomson is perhaps more associated in our minds with the great advances made in this subject than that of any other philosopher, and well may Glasgow be proud of having such a man to adorn its class-rooms. No physical laboratory can be said to be furnished unless it be supplied with the fruits of his genius.

But whilst the great scientific leaders are ever astounding us with new discoveries and new applications of scientific principles, there are scientific teachers who do no less important work, viz., in spreading the knowledge of science amongst the masses of mankind. In this important work scientific men are not behind the modern times. This is easily seen in the great improvement which has taken place in modern textbooks and subjects taught in schools. With your permission I shall say a few words as to the progress made in a country that I have recently been connected with for several years, and to you, perhaps, a country yet little known—I mean Japan. It is not thirty years since Japan was to all nations, except the Dutch, a practically unknown country. Even yet we find such errors as these amongst educated people; that Japan is a hot country, that it is dependent on China, or forms part of that great empire of the East, that its people are barbarians or semi-civilized, etc. On the contrary the winters in many parts of Japan are as cold, though not nearly so long, as in some parts of Canada; instead of being dependent on China it boasts in its history of having conquered the Chinese and made Corea a depend-

ency, and its people, far from being barbarians, were civilized when our ancestors were little better than savages, and at the present day might be a model of politeness to the most polished nations of Europe. Their works of art, I need not add, have a world-wide reputation, and have had a very great influence in art education at the present day. For several centuries the rulers of this interesting country adopted a policy of exclusiveness: they believed that all other men, except their neighbours the Chinese, were nothing but ignorant savages. It fell to our southern cousins, under the leadership of Commodore Perry, to teach this nation how fatal in many respects was this policy of its rulers. Nothing impressed the proud defenders of that land of the rising sun more than that magic power which drove Perry's ships of war out and in their bays. (I use the adjective magic, for all the European inventions of steam-engines, telegraphs, photography, etc., when first seen by the Japanese, were thought to be magic, and probably confirmed in their minds our close relationship to His Majesty of the Nether World. "Red-haired devil" was a common epithet of contempt long applied to the foreigner.) They soon saw that to hold their own with other nations they must learn the sciences of the West, and to this end, after a period of great disturbance, the Government engaged men of different nations to teach them the branches of scientific knowledge in which each was supposed to excel. French officers were engaged to teach military tactics, Germans to teach medicine, Englishmen to teach naval tactics, engineering, and agriculture, and Americans among other subjects, to show them how best to colonize their most northerly Island. Colleges were established in the capital Tokio for this purpose. It will suffice in the meantime to give

you some information of the college with which I was myself connected viz : the College of Engineering. This Institution was founded by the Minister of Public Works in the year 1873, and for its faculty he engaged a Principal, who was also Professor of Engineering, Mr. Dyer of Glasgow University, and five professors to teach Mathematics, Physics, Chemistry, Drawing, and English, and three assistants who had been ali trained as practical engineers. With this staff the college was started, and, whilst teaching was begun in temporary buildings, the college proper was erected under the superintendence of an English architect according to the requirements of Principal and Professors. As all the lectures were given in English, it was necessary that the students should know this language, and to this end the matriculation examination (which was open to all Japanese subjects) included oral English reading and writing from dictation, translation from Japanese, into English, as well as arithmetic, geography, and the rudiments of geometry and algebra. These subjects were already being taught in elementary schools both in the capital and chief towns of the provinces. The students were all boarded within the college walls, a plan we found almost indispensable, for Japanese habits were so different from our own, that it would have been difficult for them to have taken full advantage of our teaching, did they not first acquire European ways of working. The curriculum extended over six years. The first two were called the general and scientific course, and during these two years the students attended classes in English, mathematics, drawing, physics, and chemistry. After passing an examination in these subjects they entered upon their Technical course which extended over the next two years. At this stage the students were divided

into sets according to the professions they intended to follow; civil engineers, mechanical engineers, telegraph engineers, chemists, mining engineers, metallurgists and architects. In the third year of the college's history I should mention that the government had engaged additional professors of engineering, surveying, geology and mining, and architecture. During the technical course the students attended classes which fitted them for the several professions which they intended to follow, e.g. the civil engineers attended classes in engineering, surveying, higher mathematics, higher natural philosophy, technical drawing, and worked as much as possible in the engineering laboratory; the telegraph engineers attended classes on telegraphy, higher mathematics, higher natural philosophy, technical drawing and surveying, and spent much of their time in the physical laboratory, and so on. The last two years formed the practical course, and during this period the students were sent to assist in actual works carried on by the government; the civil engineers to assist in the construction of railways and bridges; the mechanical engineers to work in the government dock-yards; and so on. When I add that the college contained physical, chemical, and engineering laboratories, well supplied with apparatus, had museums for the study of geology, engineering, telegraphy, and chemistry, and further possessed a good library and a handsome examination hall, you will agree with me, that the present Japanese Government have adopted a wiser policy than that of their predecessors. And if they but overcome the fickleness of the national character there is doubtless a great future before them. The other colleges in the capital although perhaps not so completely equipped as that of the College of Engineering were nevertheless well supplied with

the material necessary to carry on their work, and were important educational institutions. I have mentioned the case of Japan as specially interesting, in its desire that scientific knowledge shall be spread amongst great masses of the people. So eager did we find our Japanese students to learn the sciences of the West that a rule had to be made in the college compelling them to take daily exercise out-of-doors. Nowhere could it be more necessary to instil the lesson of the old Latin poet: "Mens sana in sano corpore."

Our experience in Japan gave us considerable insight as to the best way of teaching science, and especially physics, with which I am more specially concerned. You might think that it was very hard to make our students study science in a foreign language. This on the contrary was the very best thing for them. When we arrived in Japan we came amongst a people who were totally ignorant of the very simplest scientific instruments with which in this country you are familiar from your childhood; a people who had no means of telling differences of temperature other than by the rude and imperfect method of touch; who didn't know that you might go on heating water until it boils, but that after that, however much heat you apply, it gets no hotter; who could hardly form an idea of what was meant by weighing the air around us; and knew no better method of measuring the height of a mountain than by the length of the road to the top of it. The magnet, the directive property of which was first discovered by the Chinese, was perhaps the only physical instrument known to them, if we except such as are used in the mechanical arts—rude turning appliances, pumps of a simple nature, bellows, etc. I might give you some amusing instances of how the universal ignorance of differences of temperature was brought to our no-

tice. In travelling in the country, having been accustomed to tea prepared in China for the European market we daily required boiling water to infuse our tea. But we everywhere found that the people had no idea that boiling water differed in any way from very hot water which was far from the boiling point, and to get what we wanted we had either to go to the kitchen ourselves to superintend the infusing, or get brazier and kettle in our rooms, where we could infuse it ourselves. The Japanese merely dry well their tea leaves as a sufficient preparation, and in this partially green state experience has taught them, that water of a medium temperature (if you will pardon such an unscientific expression) is the best to bring out the full flavour of the tea. When water boils it is said in Japanese to "stand," but even "standing water" doesn't bear along with it the idea of having a maximum temperature.

Such a people, you might imagine, not only had no words to express our modern scientific ideas, but their language was not even capable of expressing them. In these circumstances it was much better to use words already invented by the discoveries of the ideas themselves, and indeed by doing this they did nothing more than Europeans have themselves done, for nearly all our scientific terms are of Greek origin. To learn the English language was to the Japanese student the greatest boon, for thereby a great literature was made available to him, and in no better way could the store of modern scientific knowledge be thrown open to him.

In teaching physics to the Japanese I found that by far the best way was to make them thoroughly familiar with at least the simplest scientific instruments, such as balances, thermometers, pumps, magnets, etc., and to measure for themselves some of the simpler physical quantities, such as specific gravities, temperatures, dew

points, electric resistences, etc. Having spent a session in such simple laboratory work they came well prepared to understand thoroughly a course of lectures illustrated by experiments during a second session. And, while I mention this as having been a method of teaching most successfully applied in the case of Japanese, I am convinced from my experience of Scotch students, and especially from my own education (for I know well in my own case how much better such a method of being taught would have been) that it is the best method not only for Japanese, but also for Scotch or Canadian, or any other students. The most formidable objection to such a method of teaching physics is that it becomes expensive for the student. To this I answer that to those who desire a thorough education in physics, although expensive at first, it is, on account of the time it saves, the cheapest in the end; and for all of us I think it is better to have a few correct ideas so thoroughly mastered that we can apply them in after life, than a mass of hazy scientific notions which we cannot even clearly express, not to say apply in practice. While I say it is most valuable to be able to apply our knowledge in practical life, I desire you by no means to suppose that I think this the ultimate end of an education in physics or in any other branch of learning. I am quite in agreement with those who think that the true end of education, and especially of a University education, is to cultivate the mind, and thus to fit us better for any profession whatsoever in after life, an education which prepares us to seek and helps us to find a reason for every action of our lives, which teaches us to walk manfully through life by having made us sure first of the stability of the ground on which we are to tread, and whose influence is to make us soar far above every mean action. And I am bold enough to say that physics is as im-

portant a branch as any other in the University curriculum for this purpose. It is the highest development of a mathematical course of study, and thus is invaluable in leading us to correct modes of reasoning, and guarding us against hasty induction and rashly attributing results to wrong causes. It above all other subjects teaches us to methodize and arrange our facts, and thus instils into us habits most valuable in after life. In physics we have a perfect blend of the purely mathematical and purely experimental sciences, and its student is thus trained in the two great means of arriving at truth, viz., by reasoning and by observation. Physics brings before us the smallest as well as the greatest objects in the material world—the minutest organisms visible only under the highest power of the microscope, and the inconceivably great masses in the starry sphere before us. It teaches us to contemplate the most insignificant, as well as the most impressive, phenomena in nature, be it the fall of a stone to the ground, the rise of smoke in the air, the grand motions in infinite space of the earth we inhabit, or the path of light from the twinkling star trillions of miles distant. And above all it leads us from studying the creation, to think of the Great Creator to whom every action of our lives is known.

But to a Canadian audience it is needless for me to advocate the importance of a subject which is made in all parts of the world an essential part of a liberal education.

In conclusion, ladies and gentlemen, let me thank you for the intelligent way in which you have listened to what I have said. Whilst I feel the responsibility of the position I have accepted, to teach physics in this honourable University, I assure you that no effort will be wanting on my part to prove myself worthy of your confidence and of that of the University authorities, to whom I owe my appointment.

SOME POINTS IN AMERICAN SPEECH AND CUSTOMS.

BY EDWARD A. FREEMAN, LL.D., D.C.L.

IT is perfectly plain that the English tongue common to Britain and America is not spoken and written in exactly the same way in Britain and in America. The man of either land carries with him marks characteristic of his own land which will not fail to bewray him to men of the other land. But those marks are not of the nature of dialectic difference strictly so-called. I told my American hearers, in some of the lectures which I gave in several places, that between them and us I could see no difference of language, no difference of dialect, but that there was a considerable difference of local usage. Now local usage in matter of speech, whether it be of old standing or of quite modern origin, is altogether another thing from real difference of dialect. Real difference of dialect is a matter which lies pretty much beyond the control of the human will. It is often unconscious, it is almost always involuntary; if any reason can be given for the difference, it is a reason which does not lie on the surface, but which needs to be found out by philological research. But mere local usage, though it may have become quite immemorial, is not thus wholly beyond our own control. There is something conscious about it, something at any rate which can be changed by an immediate act of the will. For mere difference of local usage in language, we can often give some very obvious reason, which needs no philological research at all to find it out. For instance, what we may call the language of railways is

largely different in England and in America. But this is no difference of dialect, only difference of local usage. In each case a particular word has been chosen rather than another. In each case the word which has been chosen sounds odd to those who are used to the other. In each case we can sometimes see the reason for the difference of usage, and sometimes not. No obvious reason can be given why in England we speak of the "railway," while in America they commonly speak of the "railroad." But no one on either side can have the least difficulty in understanding the word which is used on the other side. And indeed the American might say that, in this as in some greater and older matters, he has stuck to the older usage. Though "railroad" is now seldom used in England, my own memory tells me that it was the more usual name when the thing itself first came in. "Railway," for what reason I know not, has displaced "railroad" in England, and it is worth remarking that it is doing the same in some parts of America. Here one can see no reason for one usage rather than the other, and no advantage in one usage rather than the other. But when the American goes on to speak, as he often does, of the railroad simply as "the road," his language may sometimes be a little misleading, but it is easy to see the reason for it. In England we had everywhere roads before we had railroads; the railroad needed a qualifying syllable to distinguish it from the older and better known kind of road.

But in a large part of America the railroad is actually the oldest road; there is therefore no such need to distinguish it from any other. This to us seems rather like a state of things in which printing should be familiar, but writing unknown; but it is a state of things which the circumstances of our time have brought about in a large part of the United States. That is to say, the two tendencies of which I spoke have been at work side by side. The tendency to lag behind has hindered the growth of a good system of roads; the tendency to go ahead has brought in a gigantic system of railroads. Here we see the reason for the different use of language. We see it also in the different names for the thing which, when the railroad is made, runs along its rails. In Britain it is a "carriage;" in America it is a "car." This at least by no means is a distinction without a reason. The different forms of English railway-carriage might afford some curious matters for observation to a philosopher of the school of Mr. Tylor. Nowhere can the doctrine of survivals be better studied. The original railway-carriage was the old-fashioned carriage put to a new use; the innovation lay in putting several such carriages together. It is only quite gradually that what we may call a picture of the old carriage has disappeared from our trains. This is as distinct a survival as the useless buttons on a modern coat which once fastened up a lappet, helped to carry a sword, or discharged some other useful function now forgotten. But the American "car" was not made after any such pattern. It is strictly a "car;" at any rate it is quite unlike the special meaning, attached to the word "carriage." If anything other than itself was present to the mind of the deviser of the American car, it was rather the cabin of a steamer than

any earlier kind of carriage; and such an origin is suggested by the American phrase of being "on board" a train, which I fancy is never heard in England. Among European things, the older kind of American car is most like that which is used on the Swiss railways, as if there were some kind of federal symbolism in both. And now another form of the American car is making its way into England, and with the thing the name comes too. For "car" then there is a good reason; but it is hard to see why a railway-station should be called a "depôt." The word "station" is not etymologically English; it is therefore not so good a name as the German *bahnhof*; but it is quite naturalized and familiar, while "depôt" is still foreign, and hardly becomes less so by being sounded as if it were Italian and written *dipo*. But on several American railroads the name is beginning to give way to the more reasonable word "station."

All these instances taken from railway matters are necessarily very modern; I will take another which I have no doubt is as old as English settlement in America. In England we use the word "shop" both for a place where things are made or done and for a place where things are sold. In America the word is confined to the place where things are made or done, as "barber-shop," "carpenter-shop;" a place where things are sold is a "store." Less old most likely, but certainly not of yesterday, is the usage which confines the name "corn" to one particular kind of corn, that namely which we know as "Indian corn" or maize. I heard a most distinguished Englishman—Britisher, at all events—lecture to an American audience on the history of the English Corn-laws; and I doubted in my own mind whether all his hearers would understand that he was mainly speaking of wheat. Now

neither of these forms of speech comes among the cases in which the colony has kept on the elder usage of the Mother Country. This hardly needs proof in the case of "corn." But the narrower use of that word is exactly analogous to the narrower use of the word "beast" among English graziers, and of the word "bird" among English sportsmen. In the case of "shop," the word is perfectly good English both in the wider and in the narrower sense, as it is in a good many other senses besides. But I cannot find that "store" was ever used in England in the American sense, till it came in quite lately in the case of "Co-operative stores." But I have not the slightest doubt that a perfectly good reason for the difference of usage could be found in some circumstance of early colonial life. I can fancy that in one of the first New England settlements a shop would really be a "store," in a sense in which it hardly is now on either side of the ocean. And the "co-operative store" may be so called for some reason of the same kind, or it may be because the name is thought to be finer, or it may be a mere transplantation of the American name. The "shop" or the "store" suggests its contents; and I dare say that there is some good reason, though I do not see it, why the contents of one particular kind of "store" should be specially called "dry goods." The contents of some other kinds of store seem to the untechnical mind to be equally dry. But the phrase, however it arose, is just like our phrase "hardware," which does not take in all things that are in themselves hard. Then again, I have known some foolish Britishers mock at such phrases as "town lot," "city lot;" but these are perfectly good and natural names for things to which we have nothing exactly answering in modern England. The constant use of the phrase "block," in showing a

man his way about a town, struck me at first as odd. But it is a perfectly good use. American towns are built in blocks, in a way in which the elder English towns at least are not. The "city lot" suggests the "city" itself, of which we certainly hear much more in America than in England. The use of the word "city" in England is rather strange. At some time later than Domesday and earlier than Henry the Eighth, it came to be confined on one hand and extended on the other, so as to take in all places that were bishops' sees, and no places that were not. In America a 'city' means what we should call a corporate town or municipal borough. But in England the word "city" is seldom used, except either in rather formal speech or else to distinguish the real city of London from the other parts of the "province covered with houses" which in common speech bears its name. In America the word "city" is in constant use, where we should use the word "town," even though the place spoken of bears the formal rank of a city. I remember getting into strange cross-purposes with an American gentleman who, in speaking of a visit to London, went on speaking of "the city," while he meant parts of the province covered with houses far away from what I understood by that name. "Town," in New England at least, has another meaning. A "town" or "township" may contain a "city," or it may not. On the other hand, one often hears the phrase "down town," even in New York itself. New York, by the way, calls itself a "metropolis:" in what sense of the word it is not easy to guess, as it can hardly be because it is the seat of a Roman Catholic archbishopric. And I have even known a New York paper speak of the rest of the United States as "the provinces." That insulting name is bad enough when it is applied to an Eng-

lish shire; it is surely worse still when it is applied to a sovereign commonwealth.

The words "metropolis" and "provinces," used in this way, I venture to call slang, whether the city which is set up above its fellows is London or New York. Anyhow this use of them is in no way distinctively American; indeed the misuse of the word "provinces" is, I fancy, excessively rare in America, and it is certainly borrowed from England. Each side of the Ocean unluckily finds it easier to copy the abuse of the other side than to stick to the noble heritage which is common to both. But even in the abuses of language on either side there is no strictly dialectic difference; still less is there any such difference in those legitimate varieties of local usage which have grown up out of the different circumstances of the two countries. But many of these last have thus much in common with dialectic differences, that they have come of themselves without any fixed purpose, even though we often can, as we cannot in the case of strictly dialectic difference, see why they have come. It is otherwise when one word is used rather than another under the notion of its being finer. This is plainly the case with "depôt," and I suppose it is also with "conductor" for "guard." But one cannot see either that "railroad" is finer than "railway," or that "railway" is finer than "railroad." If "store" may, from one point of view, be thought finer than "shop," the increased fineness is quite accidental; it is another thing when any man on either side calls his shop or store his "establishment." In nearly all these cases the difference matters nothing to one whose object is to save some relics of the good old English tongue. One way is for the most part as good as the other; let each side of the Ocean stick to its own way, if only to keep up those

little picturesque differences which are really a gain when the substance is essentially the same. This same line of thought might be carried out in a crowd of phrases, old and new, in which British and American usage differs, but in which neither usage can be said to be in itself better or worse than the other. Each usage is the better in the land in which it has grown up of itself. A good British writer and a good American writer will write in the same language and the same dialect; but it is well that each should keep to those little peculiarities of established and reasonable local usage which will show on which side of the Ocean he writes. It is not so with slang, on whichever side it has grown up. It is hard to define slang; but we commonly know it when we hear it. Slang, I should think, was always conscious in its origin. A word or phrase is used, not unconsciously under the natural compulsion of some good reason for its use, but consciously, indeed of set purpose, because it is thought to sound fine or clever. It presently comes to be used by crowds of people as a matter of course, without any such thought; but its origin sticks to it; it remains slang, and never becomes the true yoke-fellow of words and phrases which have grown up of themselves as they were really needed. Or again, there may be a word or phrase which is good enough in its turn with others, but which, if used constantly to the exclusion of others, seems to partake of the nature of slang. Some favourite American forms of speech seem to us in this way to savour of slang, and I believe that some favourite British forms of speech in the like sort savour of slang to an American. To take a very small example, perhaps the better because it is so very small, the word "certainly" is a very natural form of granting any request; but in

England we should hardly use it except in granting a request of some little importance, or one about the granting of which there might be some little doubt; American use extends it to the very smallest civilities of the table. "I guess" I have always stood up for, as a perfectly good form, if only it is not always used to the exclusion of other forms. "I reckon" is as good English as English can be; it is only at "I calculate" that one would begin to kick; but I do not think that "I calculate" is often heard in the kind of American society to which I was used. It might however be taken as an instance of the way in which technical and special words get into common use, sometimes on one side of the Ocean, sometimes on the other, and which seem odd to those who are not used to them. Let me take an Oxford story of perhaps five-and-thirty years ago. A story was told in a common-room of an American clergyman who was in the habit of getting into theological discussions with his bishop, and who was sometimes a little puzzled as to the way in which he ought to behave in such cases towards his spiritual superior. "I had a respect for his office," said the presbyter; "but I did not like to *endorse* all that he said." A fit of laughter went round the room. Thirty-five years ago there seemed something irresistibly ludicrous in applying a commercial word like "endorse" to agreement or disagreement on a theological matter. I am quite sure that no one would laugh at it now either in America or in Britain; we all endorse, or decline to endorse, positions on all questions, theological, political, philosophical, or any other. But I doubt whether anyone in England would talk of "the balance of the day," a phrase which I have heard in America, though I should doubt its being common. Purely legal phrases too seem to get more easily into com-

mon use in America than here, and I am told that the same is the case with medical phrases also. I was a good deal amazed at first to see "Real Estate," "Real Estate Office," written up as the mark of a place of business. I knew my Blackstone well enough to have no difficulty as to what was meant; but it looked to me very much as if anybody had advertised a "Jetsam and Flotsam office." But I presently found that "real estate," "to buy real estate," were phrases in daily use both in the newspapers and in common talk. Now certainly no one in England would, if a man had bought houses or lands, say that he had bought "real estate." He would, if he did not define the particular thing bought, be more likely to veil it under the general name of "property."

In pronunciation strictly so called, I mean the utterance of particular words as distinguished from any general tone, accent, intonation, and the like, I remarked less difference between America and England than there is in the use of the words themselves. *Of certain dialectic differences within the United States themselves* I have already said something. When the Virginian says "doe" and "floe" for "door" and "floor," it is as truly a case of dialect in the strictest sense as the difference between the dialect of Somerset and the dialect of Yorkshire. But I noticed some prevalent differences of pronunciation in America which were in no sense dialectical, but which were clearly adopted on a principle. I fancy that something that may be called a principle has more influence on pronunciation in America than it has in England. This remark is not my own; I found it, or something to the same effect, in an American periodical. It was there remarked that in America there is a large class of people who read a great deal without very much education, and who are apt to draw

their ideas of pronunciation rather from the look of the words in the book than from any traditional way of uttering them. This will most likely account for some cases, specially for one on which I shall have something to say presently. But there are other cases in which the American usage, though it sounds odd to a British ear, is strictly according to the analogy of the English tongue. I heard in America "opponent" and "inquiry," and very odd they sounded. But they simply follow the English rule of throwing the accent as far back as we can, without regard to the Latin or Greek quantity. If we say "théâtre"—which, by the way, is accidentally right, according to the Greek *accent*—"áuditor," "áblative," and a crowd of other words of the same kind, we may as well say "opponent" and "inquiry." The only reason against so doing is, I suppose, that they are a little hard to say, which is doubtless the reason why, while everybody says "áuditor" and "sénator," nobody says "spéctator." But there is one word on which I wish to speak a little more at large, as a clear instance in which the schoolmaster or the printed text or some other artificial influence has brought about a distinct change in pronunciation. The word "clerk" is in England usually sounded "clark," while in America it is usually sounded 'clurk.' I say "usually," because I did once hear "clurk" in England—from a London shopman—and because I was told at Philadelphia that some old people there still said "clark," and—a most important fact—that those who said "clark" also said "marchant." Now it is quite certain that "clark" is the older pronunciation, the pronunciation which the first settlers must have taken with them. This is proved by the fact that the word as a surname—and it is one of the commonest of surnames—is always sounded, and most com-

monly written, "Clark" or "Clarke." I suspect that "Clerk" as a surname, so spelled, is distinctively "Scotch," in the modern sense of that word. Also in writers of the sixteenth and early seventeenth century, the word itself is very often written "clark" or "clarke." But of course "clerk" was at all times the more clerkly spelling, as showing the French and Latin origin of the word. It is plain therefore that the pronunciation 'clurk' is not traditional, but has been brought in artificially, out of a notion of making the sound conform to the spelling. But "clurk" is no more the true sound than "clark;" the true sound is "clairk," like French "clerc," and a Scotsman would surely sound it so. "Clark" and "clurk" are both mere approximations to the French sound, and "clark" is the older, and surely the more natural approximation. The truth is that we cannot sound "clerk" as it is spelled; that is, we cannot give the *e* before *r* the same sound which we give it when it is followed by any other consonant. We cannot sound *e* in "clerk" exactly as we can *e* in "tent." This applies to a crowd of words, some of Teutonic, some of Latin origin, in which the spelling is *e*, but in which the sound has, just as in "clerk," fluctuated between *a* and *u*. The old people at Philadelphia who said "clark" also said "marchant." And quite rightly, for they had on their side both older English usage and, in this case, the French spelling itself. The sound "marchant" has come in, both in England and in America, by exactly the same process as that by which the sound "clurk" has come in in America, but not in England. In these cases the words are of Latin origin; so is "German," which people used to sound "Jarman" as in the memorable story of the Oxford University preacher who wished the "Jarman theology" at the bottom of the

“Jarman Ocean.” But the same thing happens to a crowd of Teutonic proper names, as Derby, Berkeley, Berkshire, Bernard, Bertram, and others. In these names the original Old-English vowel is “*eo*,” the modern spelling and the different modern pronunciations are mere approximations, just as when the vowel is the French or Latin *e*. One has heard “Darby” and “Durby,” “Barkeley” and “Burkeley;” and though the *a* sound is now deemed the more polite, yet I believe that fashion has fluctuated in this matter, as in most others. And fashion, whether fluctuating or not, is at least inconsistent; if it is polite to talk of “Barkshire” and “Darby,” it is no longer polite to talk about “Jarman” and “Jarsey.” But in all these cases there can be no doubt that the *a* sound is the older. The names of which I have spoken are often spelled with an *a* in old writers; and the *a* sound has for it the witnesses of the most familiar spelling of several of the names when used as surnames. “Darby,” “Barclay,” “Barnard,” “Bartram,” all familiar surnames, show what sound was usual when their present spelling was fixed. Tourists, I believe, talk of the “Durwent” (as they call the Dove the “Duv”); but the Derwent at Stamford bridge is undoubtedly Darwent, while the more northern stream of the name is locally Darwin, a form which has become illustrious as a surname. Now in words of this kind, while British use is somewhat fluctuating, I believe that America has universally decided for the *u* sound. But there can be no doubt that, whether in England or in America, the sound of “Durby” or “Burtram” is simply an attempt to adapt the sound to the spelling, while “Darby” and “Bartram” are the genuine traditional sounds. I see another instance, not quite of the same kind, of the influence of the

schoolmaster, in the name which in some parts of America is given to the last letter of the alphabet. This in New England is always *zee*; in the South it is *zed*, while Pennsylvania seems to halt between two opinions. Now *zed* is a very strange name. Has it anything to do with Greek *zeta*? or does it come from the old form *izzard*, which was not quite forgotten in my childhood, and which I was delighted to find remembered in America also? (*Izzard* is said to be for “*s* hard,” though surely *z* is rather *s* soft.) But anyhow *zee* is clearly a schoolmaster’s device to get rid of the strange-sounding *zed*, and to make *z* follow the analogy of other letters. But the analogy is wrong. *Z* ought not to follow the analogy of *b*, *d*, *t*, but that of *l*, *m*, *n*, *r*, and above all of its brother *s*. If we are not to have *zed*, the name should clearly be, not *zee* but *ez*. But it is a comfort that, besides *izzard*, I also found “ampussy and”—I hardly know how to write it—remembered beyond the Ocean. I may very likely be called on to explain on this side, “Ampussy and,” that is, in full, ‘*and* per se, *and*’ is the name of the sign for the conjunction *and*, &, which used to be printed at the end of the alphabet. May I quote a riming nursery alphabet of my own childhood? The letters have all done their several services towards the apple-pie that was to be divided among them:

Then AND came, though not one of the letters,
And, bowing, acknowledged them all as his betters;
And, hoping it might not be deemed a presumption,
Remained all their honours’ most humble conjunction.

The “humble conjunction” seems to have fared yet worse than Lord Macaulay’s chaplain, and to have got no apple-pie at all.

Quite distinct from the pronunciation of particular words are any general characteristics in the way of utterance which speakers of English on either side may notice in speakers of English on the other side. Americans constantly notice what they call the "English intonation," the "English accent," and I have even seen it called the "horrible English intonation." Now I am not very clear what this accent or intonation is, and the less so as I have sometimes been told that I myself have it, sometimes that I have it not, but that I speak like an American. As no man knows exactly how he himself speaks, I cannot judge which description is the truer. On the other hand we Britishers are apt to remark in Americans something which we are tempted to call by the shorter word "twang," a description less civil perhaps than "intonation" without an adjective, but less uncivil surely than "horrible intonation." As to the origin of this "twang" I have heard various opinions. Some trace it to a theological, some to a merely geographical cause. It has been said to be an inheritance from the Puritans as Puritans; others say that it is simply the natural utterance of East-Anglia, without reference to sect or party. As an American mark, the thing to be most remarked about it is, that, though very common, it is far from universal. It would be in no way wonderful either if everybody spoke with a twang, or that nobody spoke with a twang. But the facts, as far as I can see, are these. Some people have the twang very strongly; some have it not at all. Some, after speaking for a long time without it, will bring it in in a particular word or sentence; in others it is strongly marked when a few words are uttered suddenly, but dies off in the course of a longer conversation. And I distinctly marked that it was far more universal among women than among

men. I could mention several American friends from whose speech—unless possibly in particular technical words—no one could tell to which side of the Ocean they belonged, while the utterance of their wives was distinctively American. To us the kind of utterance of which I speak seems specially out of place in the mouth of a graceful and cultivated woman; but I have heard hints back again that the speech of graceful and cultivated Englishwomen has sometimes had just the same effect on American hearers. But, on whichever side our taste lies, there can be little doubt that the American utterance, be it Puritan, East-Anglian, or anything else, is no modern innovation, but has come by genuine tradition from the seventeenth century.

It is otherwise with some peculiarities which concern, not the natural utterance of words to the ear, but their artificial representation to the eye. If the schoolmaster is a deadly foe to language, English or any other, the printer is a foe no less deadly. Half the unhistorical spellings which disfigure our printed language come from the vagaries of half-learned printers, on which side of the Ocean matters very little. As for Latin words, one is sometimes tempted to say, let them spell them as they please; but it is hard when Teutonic "rime," a word which so many Romance languages have borrowed, is turned into "rhyme," merely because some printer's mind was confused between English "rime" and Greek "rhythm." So with specially American spelling-fancies. If anyone chooses to spell words like "traveller" with one *l*, it looks odd, but it is really not worth disputing about. Nor is it worth disputing about "color" or "colour," "honor" or "honour," and the like. But when it comes to "armor," still more when it comes to "neighbor," one's Latin back in the

former case, one's Teutonic back in the other, is put up. Did he who first wrote "armor" fancy that "armor" was a Latin word like "honor" or "color?" By all means let *armatura*, if anyone chooses, be cut short into *armure*; but let us be spared such a false analogy as *armor*. 'Arbor' for "arbour" brings out more strongly the delusion of those who, having a Latin tree on the brain, doffed Teutonic "harbour" of its aspirate. But the most unkindest cut of all is when Old-English "neáhgebúr," which, according to the universal rule of the language, becomes in modern English "neighbour," is also turned into "neighbor." Did anybody, even a printer or a dictionary-maker, really fancy that the last three letters of "neighbour" had anything in common with the last three letters of "honour"? It is surely hardly needful to say that Old-English *u* is in modern English consistently represented by *ou*; "hús" becomes "house;" "súð" becomes "south;" "út" becomes "out"—and "neáhgebúr" becomes "neighbour." American printers too have some odd ways in other matters, specially as to their way of dividing words when part of a word has to be in one line and part in another. Thus "nothing" will be divided, not as "no-thing," but as "noth-ing," as if it were the patronymic of a name "Noth." Yet surely even a printer must have known that "nothing" is "no-thing" and nothing else. So again "knowledge" is divided as "knowl-edge," suggesting rather the side of a hill than the occupation or condition of one who knows. It is really quite possible that the *d* may have been thrust into "knowledge"—better written "knowlege" from some thought of a *ledge*. Anyhow one suspects that very few people know that *ledge* in "knowledge" and "lock" in "wedlock" are one and the same ending. "Wedlock" at least is safe from being divided as "wedl-ock,"

because everybody thinks that it has something to do with a lock and key.

It would be easy to pile together a far longer list of differences of usage in matter of speech between England and America. But I have perhaps brought together enough to illustrate my main general positions. I have tried to show that so-called "Americanisms" are not to be at once cast aside, as many people in England are inclined to cast them aside, as if they were necessarily corruptions of the common speech, as if it proved something against a form of words to show that it is usual in America, but that it is not usual in England. Abuses of language undoubtedly arise in America, just as they do in England. It is hardly worth while trying to count up and find out in which country they are the more common. Possibly the go-ahead side of the younger English land may win for it the first place. But, if so, it is merely a difference of degree, not of kind. I fancy that "racial" is American; but "sociology" is undoubtedly British. On the other hand, the conservative side of the American character has led to the survival in America of many good English words and phrases which have gone out of use in England, and which ignorant people therefore mistake for American inventions. In other cases, again, differences of usage between the two countries are fully explained by differences of circumstances between the two countries. In some cases, again, usages which cannot be called correct, but which differ from mere abuses of language, have been brought in—in either country—through mistaken analogies or other processes of that kind. In these different ways there has come to be a certain distinction between the received British and the received American use of the common English tongue, a distinction which commonly makes it easy to see from

which side of the Ocean a man comes. But there is no real difference of language, not even any real difference of dialect; the speech of either side is understood without an effort by the men of the other side, and the differences are largely of a kind in which neither usage can be said to be in

itself better or worse than the other. Such is the general result of what I have to say about language and about some points specially connected with language. In another article I hope to carry on the same line of argument with regard to some other matters.—*Longman's Magazine for November.*

THE DISCIPLINE OF THE SCHOOL.

BY HIRAM ORCUTT, LL.D.

THE object of school discipline is two-fold, viz., school vices must be prevented or cured and school virtues must be cultivated. Among school vices, as they have been classified, are idleness, whispering, disorderly movements in the school room, injury to property, and rudeness of speech or act in the intercourse of every day life. The school virtues to be cultivated are suggested as the opposites of these, viz., regularity of attendance, promptness, obedience, truthfulness, earnestness, diligence, kindness, neatness, and thoroughness in the preparation and recitation of lessons; and these are to be secured, not only to promote the business of the school-room, but also for their influence in forming habits and character.

1. *Organization is the first business of the school room*, and nothing else should be attempted until this is accomplished. The object in view is that systematic arrangement and uniformity which will secure good order and promote studiousness. To this end, the pupils should be so seated that they will appear uniform, and not disturb each other in the necessary movements of the day; the rogues should be separated, and every temptation to idleness and mischief re-

moved. A complete division of time into periods of study, recitation, and play is also necessary. A time for disorder is, however, just as necessary as a time for study; hence the teacher must provide, not only regular recesses for freedom in the open air, but also occasional recesses from study (say two minutes) for the purpose of opening the safety valve of mischief and giving opportunity to whisper, ask questions, leave seats, and attend to all other necessary irregularities not allowed at other times. In this way, the least excuse for indulgence during the quiet hours of study and recitation is removed. The teacher can now insist upon perfect order while order is the law.

It is much easier and more merciful to govern perfectly than partially. A system of discipline, to gain the respect of the pupils and accomplish its object, must be inflexible, earnest, strong, thorough. The very fact of such a government has a silent but powerful influence in preventing evil and securing obedience and fidelity.

2. *All school laws must be based upon authority.*—This is the very germ and only foundation of good government. It must be distinctly understood that persuasion may never take the place

of authority in school management. When, however, the *right* to maintain authority is not questioned by the pupil or after he has been subdued to obedience, we may persuade, invite, and win. But kindness cannot supply the place of authority. Obedience is not a voluntary compliance with a request, but a hearty response to acknowledged authority—an implicit yielding to a command. Such obedience, prompt and unreserved, is the duty of every pupil. This is a government, not of persuasion, not of reasons assigned, not of the will of a majority, but of one master. From this decision there may be an appeal, but disobedience never.

The present is an age of insubordination, and can we doubt that this has resulted from the loss of authority in the family and school? Parents and teachers have abandoned the principles of government established by our fathers. They no longer enforce obedience, but attempt to purchase it by a promised reward.

3. *Another important agency in school discipline is work.*—Both the master and his pupils must work. In dolence in him begets idleness and recklessness in them. Life, energy, and industry manifested by him will be at once reproduced in them. The teacher must work to fit himself for his high calling and to elevate his profession. He must work for his school, to interest and benefit his patrons, to rouse and inspire his pupils, and to prepare himself for his daily teaching. Indeed, the true teacher is always reading, thinking, or acting for his school.

4. *Still another moulding and controlling power in the school-room is public opinion.*—This must be created and directed by the master, or he is powerless. And first of all he must create a favourable opinion of himself; that is, must gain the confidence of his patrons and pupils. To this end

he must form an intimate acquaintance with both parents and pupils.

5. *Mental and physical recreation are important disciplinary agencies.*—The mind and body are inseparably connected. Hence mental culture cannot be successfully carried on without physical culture. Both mind and body must have recreation more than the ordinary recesses and holidays afford, and as every teacher knows there are certain hours and days when the fiend disorder seems to reign in the school-room. He cannot assign any reason, but the very atmosphere is pregnant with anarchy and confusion. And what can the teacher do to overcome the evil? He may tighten his discipline, but that will not bind the volatile essence of confusion. He may ply the usual energies of his administration, but resistance is abnormal. He will encounter the mischief successfully only when he encounters it indirectly. Here applies the proposed remedy, mental and physical recreation. Let an unexpected change divert the attention of the pupils; let some general theme be introduced in a familiar lecture or exciting narrative; or, if nothing better is at hand, let all say the multiplication table or sing "Old Hundred," and the work is accomplished. "The room is ventilated of its restless contagion, and the furies are fled." Now add to this mental the physical recreation of school gymnastics, and the remedy is still more sure.

6. *Kindness is another powerful agency in the management of a school.*—By this, as exemplified in the life of the true teacher, I mean his uniform good will, earnest sympathy, and hearty generosity, habitually exercised toward his pupils. There is no force on earth so potent as love. When it has possession of the human heart it is all pervading and overpowering, and especially if brought to bear upon sympathetic childhood and youth.

That teacher alone who loves his

pupils has power to gain their love and confidence, which should be his chief reliance in school management. An affectionate pupil will confide in our judgment, respect our authority, and fear our displeasure. If we show him by our personal attention and kindness that we are his true friends and that all our efforts are designed to secure his best good, and make him believe it, we hold him as by the power of enchantment; we have no further need of physical force as applied to him. But this kindness, which is an essential element in every true system of government, is not, and cannot be, a substitute for authority or an obstacle to severity, when the good of the individual or the school demands it. The teacher must cherish an abiding love for his pupils, and that love is never more truly exercised than in inflicting necessary pain in the management of public affairs. Of the teacher's heart Shakespeare could not say, "It is too full of the milk of human kindness," if only he has enough of authority, firmness, and executive will. Without these, even love, as an element of school discipline, is sometimes powerless.

7. *This brings me to consider the discipline of punishment.*—I have spoken of the power of system, law, and kindness, in their silent but effective influence upon individuals and the school. I have spoken of the means and methods of preventing evil. I come now to the penalties to be inflicted when crime has been committed. Wholesome laws will be violated under every system of school management. The question to be settled is, Should the government of the school be positive and efficient? If so, the master must have the right, disposition, and power to inflict punishment when necessary. If this right is denied or this power withheld, the government of the school is at the mercy of circumstances; it cannot be sus-

tained. In the dispensation of penalties, professional knowledge, and wise discrimination are requisite. The circumstances connected with the offence must be carefully studied and a distinction always made between wilful and unintentional wrong. The isolated act of transgression does not indicate the degree of guilt incurred nor the kind of punishment to be inflicted; the presence or absence of palliating circumstances, the motives which generated the act, the present views and feeling of the offending pupil, must all be taken into account. The master should never, therefore, threaten a specific punishment for anticipated offences. No two cases of transgression will be exactly alike, and hence the kind and degree of punishment should be varied as the case demands. But the good disciplinarian seldom resorts to severe punishment in the government of his school; yet he never relinquishes his right to punish as circumstances require. Nor does he regard severity, when necessary, as an evil to be deplored. It is indeed a sore evil that mortification has so endangered the life of the patient that the limb must be amputated; but it is not an evil that you have at hand surgical skill and suitable instruments to perform an operation. It is indeed a misfortune that any child or pupil has become so demoralized and reckless as to incur the penalties of the law; but Solomon's rod, which has restored him to obedience and duty, is a blessing whose influence will be felt and acknowledged by the offender as long as he lives.

Nor is severe punishment to be regarded as the "last resort." When it may be inflicted at all, it is the first resort, and the true remedy. Allow me to illustrate: A skilful physician is called to prescribe for a patient sick almost unto death. He sees, at a glance, that only one remedy will cure, and that must be administered prompt-

ly. Now the question is, shall that powerful medicine be given at once or as "the last resort," after every mild remedy has failed? If the doctor resorts to herb drinks and tonics in the case supposed, he is a quack, and his patient will die while the tenderhearted simpleton is experimenting upon him. But the "*calomel*" is given and the patient recovers. So with punishment. It may be mild or severe; each kind is appropriate as a remedy for specific evils. But if the case is one that requires great severity, that kind of punishment must be inflicted promptly and faithfully. "Spare the rod and spoil the child," under such circumstances. Much has been said and written upon corporal punishment and moral suasion, but their appropriate use in school discipline is seldom understood, as it seems to me.

Moral suasion is not the remedy for bold and defiant violations of law, if we mean by that term the persuading of the culprit to return to obedience or the purchase of his allegiance by a promised reward. Rebellion should be met by stunning, crushing blows, such as will vindicate and reestablish authority and deter others from committing the same crime. Mildness is cruelty under such circumstances. All such cases demand instant and determined action. The time for conciliation is after the rebels are subjugated and the authority of the government is restored. But moral influence and kindness should attend every act of severity; never let the sun go down upon the wrath of a chastised pupil. See him alone, bring to bear upon him every moral power, treat him now with kindness and confidence, and thus restore him to duty and favour. Without the rod, moral suasion might have been powerless, or, if successful, what was gained by persuasion was lost to authority. It must never be doubtful that the master has supreme control over his little kingdom. If

his authority is trifled with it must be restored without delay, and any punishment is judicious that is necessary to this end. The system of government here recommended does not offer an angry word or blow for every offence, real or fancied. The best masters who have adopted it punish the least. And when severe punishment becomes necessary, the pupil is made to believe that a sense of duty, and not passion, nerves the arm to strike the blow. He is made to understand that it is the master's duty to command and the pupil's duty to obey. Practically, the system of government based upon authority has alone been successful; every system that has abandoned the right or lost the power to punish has proved a failure.

In punishing for falsehood, pilfering, profanity, and the like, it should be borne in mind that, while "the rod and reproof give wisdom," yet the moral treatment of such offences is *always* appropriate, either with or without severity, as the case may be. If the knowledge of an offence is confined to the offender and the teacher, it should be treated privately, for the good of the individual. But public crime must meet public punishment, that all similar cases may be reached and the school benefited. Let the folly, wickedness, and consequences of the crime be fully exposed and brought home to the conscience. And in the settlement of the question never fail to leave the way open for repentance and restitution. One example, to illustrate:

A gold dollar had disappeared from the teacher's table while she stepped to a neighbouring room. Two school girls, who were the only persons present, had disappeared. It was Saturday, and in the evening the young ladies were assembled in the public parlour for family worship. The principal, who was conducting the exercises, commenced describing the

effects and consequences of having, by accident, deposited a gold dollar upon the human lungs. It would corrode and poison, produce inflammation, disease and death, if it could not be removed. He then transferred the gold dollar from the lungs to the conscience, and portrayed the consequent guilt, remorse, anguish, and moral death resulting from such a crime, if not repented of. He presumed the young lady would gladly restore the money and save herself the disgrace and suffering which must follow. He told her where she could leave the dollar, and that the fact of restoring it would be proof of her penitence and would save her from exposure. In her desperation, she had already thrown the gold dollar down the register; but she did borrow the amount from her teacher, confidentially, to be paid from her spending money, and deposited it as suggested. And so the whole matter was settled and the most satisfactory results followed. The parents of the young lady never knew that anything of the kind had occurred. This case indicates the method I would adopt in dealing with school vices.

8. *The discipline of study may next be considered.*—Study is mental gymnastics, systematic thinking, and the end in view is development and culture. One great object of the school is to induce and direct this mental exercise. Study is of the first importance, and hence must have the first attention of every practical teacher. In the organization, classification, management, and government of his school his chief aim is to secure systematic thinking. To this end he arranges certain hours of the day to be especially devoted to study. No unnecessary interruptions are allowed. In the selection of studies and the arrangement of classes he has regard to the capacity and standing of each pupil, so that he may work easily and

successfully. He requires a regular hour to be devoted to each study and recitation, that order and system may everywhere prevail. He enforces rigid discipline, that the school-room may be quiet, and most important of all, he inspires his pupils with an enthusiasm that creates a love for the duties of the school and earnestness in study. He teaches his pupils how to study. He shows them that it is not the number of hours spent with books in hand, but close application, that secures thorough discipline and good lessons, and that self-application is the only condition of sound learning. Hence he will not allow them to seek assistance from each other nor often from the teacher. And the wise teacher instructs his pupils to study thoughts and subjects, instead of words and books. Thus correct habits of study are formed, and the foundation is laid for successful training at every future stage of education.

Study is the exercise of acquiring, and the only means of mental culture; mind is developed through its agency, and power of self-control and self-direction gained.

9. *The discipline of recitation comes next in order.*—Recitation is the exercise of expression, and, like study, belongs wholly to the scholar. Study and recitation are the principal means of gaining mental power and practical ability. Both are indispensable to the end in view, if not equally important.

It follows, therefore, that every pupil must recite at every recitation or suffer a loss. Classes should never be so large as not to allow this thorough personal drill. That teacher who claims ability to educate classes numbering from fifty to seventy-five is either a novice or a quack. Such teaching is a fruitful source of indolence and superficial scholarship. Recitation in concert is equally objectionable. This may occasionally be profitable for recreation and im-

provement, when the whole school can engage in it; but class recitation in concert, as a habit, creates disorder, prevents quiet study, destroys self-reliance, affords a hiding-place for the idle and reckless, and removes the strongest motive for self-application.

As recitation is wholly the work of the scholar, he should recite independently, and as intimated, topically, when the subject will admit of it. Captions, definitions, tables, and fixed rules should be accurately recited in the words of the author, but every other kind of lesson should be expressed in the pupils own language. In this way the mind becomes a depository of thoughts, instead of mere words and signs, and power is gained to express them accurately and logically. And the recitation should be made standing, that the pupil may be brought out prominently before the class, and acquire the habit of thinking and speaking in that exposed position. This will give him confidence and self-control. But some thoughts cannot be expressed in words; these must be drawn out in figures, diagrams, and maps. Again, the skilful teacher will adapt his instruction to the capacity, attainments, and dispositions of his scholars. Some are bright, and some are stupid; some are timid and some are bold; and some have enjoyed better advantages than others at home and abroad. Now, each of these classes requires special training; and that teacher alone is wise and can hope to be eminently successful who is able to adapt his treatment and instruction to the wants of all. Every mind must be tasked to be educated; and hence each scholar should have just such lessons assigned him, as he is able, by the greatest exertion, completely to master. The dull scholar should have few lessons at the same time; the easy scholar more, each according to his ability to learn. Dis-

cipline is the end in view, and nothing can supply the place of it. Mere scholarship does not make the man; genius, even, needs culture as well as stupidity.

10. *The discipline of good manners.*—This subject, which our fathers seem to have regarded of great importance, has been fearfully neglected in these latter days. As a consequence, our children in the family and school practice only rudeness and insubordination. To such an extent has this department of education been neglected of late in our country that we have received merited reproach from other nations. We may here draw the contrast between the old and new civilization. The old was distinguished by a proper regard for all the courtesies of refined life; the new can boast of nothing but incivility. The rapid decline of good manners in our times appears most evident when we compare the practice of our fathers with their degenerate grandchildren. The old civilization recognized the "bow" and "courtesy" as tokens of respect. They have ever been so regarded, though sometimes used as mere signs of recognition. In the rural districts, the bow and courtesy have been regarded as evidence of good breeding, and as the expression of proper reverence cherished by the young for their superiors. Alas! that the sign and the thing signified have nearly passed away! The expressions of genuine politeness and deference which were met in every cultivated family and good school in the days of the distinguished Dr. Edwards have given place to habits of coarseness and incivility, and the "sir" and "madam," which were always used by the children in the genteel family as a title of respect for parents, have, with the bow and courtesy, passed away. And where now do we find that gentleness, politeness, and ready obedience which

characterized the children in their relations to those whom God had placed over them in their own homes? In those days, under the direction of parental authority, children kept their places, regarded their instructors, and observed all the little acts of civility which throw a charm around the family circle. Not so now. Rudeness characterizes all their movements at home and in school. With their heads covered, they lounge about the house, intrude themselves into company, interrupt conversation, dispute with superiors, and make themselves disagreeable in every way. At school the bound and scream which follow the word of dismissal remind one of incipient savages.

Now, the manners of a people surely indicate their morals; but human society itself exists only so long as the moral sense of the community is preserved. Of manners and morals it may, then, be affirmed that the one is but the complement of the other, and that they cannot be separated. Morals divorced from manners become cold and repulsive; but when

united they are attractive and pleasing. And how are we to gain what we have lost in this important department of education? Lack of home culture and discipline is the principal cause of the evil we contemplate. Children left to their own ways grow up in the entire disregard of common courtesy. They neglect to show proper respect to parents and teachers, to seniors in age, and to superiors in station, wisdom, and virtue. And if the ordinary civilites of refined life are not regarded in the family and school and in the social intercourse of home society, how can we expect that politeness will be extended to the stranger met in the marts of business or in the walks of pleasure? In the present condition of society, much responsibility in regard to the needed reform rests upon the teachers of our public schools. And the only way to accomplish the desired object is by earnest self-culture and faithful instruction on the part of the teachers of the nation, and those who are candidates for that responsible office.—*Chicago School-master.*

SONNET.

BY ARNOLD HAULTAIN, M.A., ON READING KEATS'S "FANCY."

"She will bring, in spite of frost,
Beauties that the earth hath lost."

Ah Keats! 'tis hard for me—so far away
From all I love and long to see again—
To "let the Fancy roam" and not complain
That *my* commands at least she'll ne'er obey.
No boisterous ocean towers from shore to shore
Between you and your own sweet English home.
To you all flowers, long winter lost, will come
As fresh and lovely, smiling as before.
But here, alas! no whitening hawthorn trees
Vie with soft scent of violets unseen
That shyly steals through hedge of moss-banked lane;
No daisies gleam Ay me, *to think* of these,
These meekest "beauties" of my island green,
Is sad, since oft I seek for them in vain.

UNIVERSITY WORK.

MATHEMATICS.

ARCHIBALD MACMURCHY, M.A., TORONTO,
EDITOR.

CAMBRIDGE UNIVERSITY EXAMINATION.

MATHEMATICAL TRIPOS, JUNE, 1882.

EUCLID.

1. The straight lines which join the extremities of two equal and parallel straight lines towards the same parts, are also themselves equal and parallel.

If $ABCD$ be a parallelogram and AP , BQ be one pair of parallel straight lines and CQ , DP another pair of parallel straight lines, then PQ will be equal and parallel to AB and DC .

2. In obtuse-angled triangles, if a perpendicular be drawn from either of the acute angles to the opposite side produced, the square on the side subtending the obtuse angle will be greater than the squares on the sides containing the obtuse angle, by twice the rectangle contained by the side on which, when produced, the perpendicular falls, and the straight line intercepted without the triangle, between the perpendicular and the obtuse angle.

If $ABCD$ be a quadrilateral and P , Q , R , S be the middle points of AB , BC , CD , DA respectively, then

$$2 \text{ sq. on } PR + \text{sqs. on } AB, CD \\ = 2 \text{ sq. on } QS + \text{sqs. on } BC, DA.$$

3. If a straight line drawn through the centre of a circle bisect a straight line in it which does not pass through the centre, it will cut it at right angles.

If two pairs of opposite sides of a hexagon inscribed in a circle be parallel, the third pair of opposite sides will be parallel.

4. If from any point without a circle two

straight lines be drawn, one of which cuts the circle, and the other touches it; the rectangle contained by the whole line which cuts the circle, and the part of it without the circle, will be equal to the square on the line which touches it.

Draw through a given point P a straight line PQR to meet two given straight lines in Q , R , so that the rect. PQ , PR shall be equal to a given quantity.

5. The rectangle contained by the diagonals of a quadrilateral figure inscribed in a circle is equal to the sum of the rectangles contained by its opposite sides.

If ABC be an equilateral triangle and P a point on the circumscribing circle on the side of BC remote from A , then

$$\text{sq. on } PA = \text{rect. } PB, PC + \text{sq. on } BC.$$

ALGEBRA AND TRIGONOMETRY.

1. Show that the figure nine cannot occur in the decimal part of a fraction whose denominator is less than ten. In the scale whose radix is r , what figures, if any, cannot occur in the decimal part of a fraction whose denominator is less than r ?

2. Show that the following expression is a perfect cube:

$$a^3 b^3 (a-c)^3 (b-c)^3 \\ + b^3 c^3 (b-a)^3 (c-a)^3 + c^3 a^3 (c-b)^3 (a-b)^3 \\ + 3a^2 b^2 c^2 (a-b)^2 (b-c)^2 (c-a)^2.$$

Prove the identity:

$$(ax + by + cz)^3 + (ay + bz + cx)^3 + (az + bx + cy)^3 \\ - 3(ax + by + cz)(ay + bz + cx)(az + bx + cy) \\ = (a^3 + b^3 + c^3 - 3abc)(x^3 + y^3 + z^3 - 3xyz).$$

3. Find the sum of n terms of a series in geometrical progression.

Show that, if the sum of the m^{th} powers of the several terms of an infinite geometrical progression whose first term is a and common ratio is r be denoted by s_m , then

$$\left(\frac{1}{s_1} + \frac{1}{s_2} + \frac{1}{s_3} + \dots\right)^2 - \left(\frac{1}{s_2} + \frac{1}{s_3} + \frac{1}{s_4} + \dots\right)^2 = \frac{a^2}{a^2 - 1} \frac{(1-r)^2}{a^2 - r^2}$$

Show by an *ex absurdo* proof that a quadratic equation cannot have more than two roots.

Solve the following equations :

(i.) $\frac{50x^2 + 75x - 1250}{5x + 8} - \frac{40x^2 - 592x}{4x^2 - 7} + 1 = 0.$

(ii.) $ax^2(y-z) = by^2(x-z) = cz^2(x-y) = d^4.$

Find the roots of the equation

$$9^x - 8 \cdot 3^x + 3 = 0$$

to five places of decimals.

5. Assuming the binomial theorem to have been proved true for any positive integral exponent, prove its truth for any positive exponent.

If $\phi(x, n) = \frac{1}{x} - n \frac{1}{x+1} + \frac{n(n-1)}{1 \cdot 2} \frac{1}{x+2} - \dots$

where n is a positive integer, find a relation connecting $\phi(x, n)$ and $\phi(x+1, n+1)$; and thence show that $\phi(x, n) = \frac{n!(x-1)!}{(x+n)!}$.

6. Assuming the expansion of e^x in ascending powers of x , deduce the expansion of $\log(1+x)$.

Hence, from the identity $x^3 + 1 = (x+1)(x^2 - x + 1)$, show that, if m be a positive integer,

$$1 - \frac{6m-2}{1 \cdot 2} + \frac{(6m-3)(6m-4)}{1 \cdot 2 \cdot 3} - \frac{(6m-4)(6m-5)(6m-6)}{1 \cdot 2 \cdot 3 \cdot 4} + \dots = 0.$$

vii. Explain the different methods of measuring angles.

Find the number of degrees in each angle of a regular polygon of n sides, (1) when it is convex; (2) when its periphery surrounds the inscribed circle m times.

Find, correct to .01 of an inch, the length of the periphery of a decagon which surrounds an inscribed circle of a foot radius three times.

viii. Prove geometrically the formula

$$\cos \alpha + \cos \beta = 2 \cos \frac{1}{2}(\alpha + \beta) \cos \frac{1}{2}(\alpha - \beta).$$

Prove that

$$\begin{aligned} & 2 \cos(\alpha - \beta) \cos(\theta + \alpha) \cos(\theta + \beta) \\ & + 2 \cos(\beta - \gamma) \cos(\theta + \beta) \cos(\theta + \gamma) \\ & + 2 \cos(\gamma - \alpha) \cos(\theta + \gamma) \cos(\theta + \alpha) \\ & - \cos 2(\theta + \alpha) - \cos 2(\theta + \beta) - \cos 2(\theta + \gamma) - 1 \end{aligned}$$

is independent of θ , and exhibit its value as the product of cosines.

ix. Prove geometrically the formula

$$\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}.$$

Prove that, if $\alpha, \beta, \gamma, \delta$ be four solutions of the equation $\tan(\theta + \frac{1}{2}\pi) = 3 \tan 3\theta$, no two of which have equal tangents, then

$$\tan \alpha + \tan \beta + \tan \gamma + \tan \delta = 0,$$

and $\tan 2\alpha + \tan 2\beta + \tan 2\gamma + \tan 2\delta = \frac{1}{3}$.

x. Show that in general the change in the cosine of an angle is approximately proportional to the change in the angle.

Prove that, if in measuring the three sides of a triangle, small errors x, y be made in two of them a, b , the error in the angle C will be

$$-\left(\frac{x}{a} \cot B + \frac{y}{b} \cot A\right),$$

and find the errors in the other angles.

xi. Show that in any triangle

$$a \cos B + b \cos A = c,$$

and deduce the formula

$$c^2 = a^2 + b^2 - 2ab \cos C.$$

Prove that, if O be the centre of the circumscribed circle of the triangle ABC , the sides of the triangle formed by the centres of the three circles BOC, COA, AOB , will be proportional to $\sin 2A : \sin 2B : \sin 2C$; and find the angles of the new triangle correct to one second, when the sides of the triangle ABC are in the ratio of 4 : 5 : 7.

xii. Find the radius of the inscribed circle of a triangle in terms of one side and the angles.

Prove that, if P be a point from which tangents to the three escribed circles of the triangle ABC are equal, the distance of P from the side BC will be

$$\frac{1}{2}(b+c) \sec \frac{1}{2}A \sin \frac{1}{2}B \sin \frac{1}{2}C.$$

UNIVERSITY OF LONDON.
INTERMEDIATE EXAMINATION IN ARTS,
JULY, 1882.

1. Express $\sqrt{\frac{26.54 \times 0.004321}{0.00001357}}$ correctly to the nearest integer.

= 92 nearly.

2. Prove that any number is divisible by 9 if the sum of its digits is divisible by 9. Prove also that a number is divisible by 11 if the sum of the odd digits (*i.e.* the 1st, 3rd, 5th, etc.) exceeds or is less than the sum of the even digits (*i.e.* the 2nd, 4th, 6th, etc.) by a number divisible by 11.

Bookwork. See Todhunter, articles 444, 445.

3. What must the rate of interest be that a sum of money may accumulate at compound interest to double its amount in 20 years?

$$R = 2^{\frac{1}{20}} \log R = \frac{1}{20} \log 2 = .0150515.$$

By making use of the given log we find the required rate to be $3\frac{1}{2}$ per cent.

5. Reduce to their lowest terms

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

$$(b) \frac{x^4+5x^3+6x^2+5x+1}{x^4+3x^3-2x^2+3x+1} = \frac{(x^2+4x+1)(x^2-x+1)}{(x^2+4x+1)(x^2-x+1)} = \frac{x^2+x+1}{x^2-x+1}$$

7. The first term of a geometrical progression is a , and the tenth term is b , find the n^{th} term.

$$\text{The tenth term} = ar^9 = b, \therefore r = \left(\frac{b}{a}\right)^{\frac{1}{9}}$$

$$n^{\text{th}} \text{ term} = ar^{n-1} = a \left(\frac{b}{a}\right)^{\frac{n-1}{9}}$$

8. Solve the equation

$$\frac{2}{x^2+2x-2} + \frac{3}{x^2-2x+3} = \frac{x}{2}$$

$$\frac{2x^2-4x+6+3x^2+6x-6}{x^4-4x^2+3x^2+6x-2x^2+4x-6} = \frac{x}{2}$$

$$\frac{5x+2}{x^4-3x^2+10x-6} = \frac{1}{2}, x=0,$$

$$x^4 - 3x^2 = 10, \quad x^2 = 5 \text{ or } -2,$$

$$x = \pm\sqrt{5} \text{ or } \pm\sqrt{-2}$$

$$\therefore x=0; \pm\sqrt{5}; \pm\sqrt{-2}.$$

9. The sum of the squares of two numbers is 650, and their product is 323; what are they?

Let x = one number, $\frac{323}{x}$ = other number;

$$x^2 + \left(\frac{323}{x}\right)^2 = 650,$$

$$x^4 - 650x^2 = -104329$$

$$x^2 - 325 = \pm 36$$

$$x^2 = 361 \text{ or } 289,$$

$$x = \pm 19 \text{ or } \pm 17.$$

10. What is the present worth of a perpetual annuity, £10 payable at the end of the first year, £11 at the end of the second, and so on, increasing £1 each year; interest being taken at 4 per cent.?

$$S = 10 \left\{ \frac{1}{1.04} + \frac{1}{(1.04)^2} + \dots \right\}$$

$$+ \frac{1}{(1.04)^2} + \frac{2}{(1.04)^3} + \dots = s_1 + s_2, \text{ say}$$

$$s_1 = 10 \cdot \frac{\frac{1}{1.04}}{1 - \frac{1}{1.04}} = 250,$$

$$s_2 = \frac{1}{(1.04)^2} + \frac{2}{(1.04)^3} + \frac{3}{(1.04)^4} + \dots$$

$$\frac{s_2}{(1.04)} = \frac{1}{(1.04)^3} + \frac{2}{(1.04)^4} + \dots$$

$$\therefore s_2 \left(1 - \frac{1}{1.04}\right) = \frac{\frac{1}{(1.04)^2}}{1 - \frac{1}{1.04}}$$

$$s_2 = 625, \therefore S = 875.$$

CLASSICS.

G. H. ROBINSON, M.A., WHITBY, EDITOR.

ANSWERS TO CORRESPONDENTS.

"E. L. C."—Your papers on Cæsar will probably appear in December number.

"A. F."—The question of *phonetics* is a very wide one. You will probably find

enough for your present purpose in the Revised Harkness' Lat. Gr., pp. 11-20. Standard Edition of 1881.

"J. P.," "F. D." and others. Read carefully the Introductory Essays in "Pott's Hints on Latin Prose" for a good exposition of the genius of the Latin language.

"R. D. F."—"Farrar's Greek Syntax" has something to say on the difference between Attic and New Testament Greek. The last edition has an index.

"MAGISTER."—The reading in "Horace Carm." I., i., 5, to which you refer, is *Sí vitata rotis*.

"STUDENT."—For Homer "Keep's Autenreith's Homeric Dictionary (Harper's)" is highly spoken of. There is a second edition. For a detailed explanation of the various Latin metres, see the section on Prosody in Chase's Latin Grammar (Philadelphia: Eldridge Bro., 1882).

NOTES AND QUERIES.

The Johns Hopkins University Circulars contain much matter interesting to students of classics.

The article on "The Latin Language" in Vol. XIV of the new edition of "the Encyclopædia Britannica" by Prof. Wilkins, Owen's College, Manchester, is full of interest to the classical scholar.

Has not the time arrived in Ontario for classical teachers to make some united effort in introducing generally the pronunciation of Latin in use in Cicero's time as now determined by acknowledged authorities? Are the obstacles to this desirable object insurmountable?

UNIVERSITY OF TORONTO. SUPPLEMENTAL EXAMINATIONS, 1882.

Senior Matriculation and First Examination.

GREEK.

Examiner—William Dale, M.A.

Translate Herodotus, VII., c. 223.

1. Parse ἐπέστατο, ἀπολλυμένον, ἐπιστάμενοι, μέλλοντα.

2. Describe the pass of Thermopylæ, and give an account of the battle.

3. Give a brief sketch of the life of Herodotus.

4. What is meant by λέγει εἰρομένη?

Translate Homer, *Iliad*, XII., vv. 440-456.

1. Parse σανίδων, φέρε, αἰέρας, εἰρυντο, ἀρρυίας.

2. Give the ordinary prose forms of the words οὔασι, κροσσάνων, ῥηιδίως, δχῆτες, κληῖς.

3. Derive βροτοί, δικλίδας, δχῆτες, ποιμήν, πακος.

4. Scan line 449.

5. Translate with brief notes:

(a) *Laudibus arguitur vini vinosus Homerus.*

(b) *Ennius et sapiens et fortis et alter Homerus.*

(c) *Indignor quandoque bonus dormitat Homerus.*

(d) *Tu nihil in magno doctus reprehendis Homero?*

(e) *Nec sic incipies ut scriptor cyclicus obim.*

LATIN.

Examiner—J. Fletcher, M.A.

I.

Translate:

Cum verbis extollentes gloriam virtutemque populi Romani ac magnitudinem imperii petissent, ne Poeno bellum Italiae inferenti per agros urbesque suas transitum darent, tantus cum fremitu risus dicitur ortus, ut vix a magistratibus majoribusque natu juvenutus sedaretur: adeo stolidi impudensque postulatio visa est. censere, ne in Italiam transmittant Galli bellum, ipsos id advertere in se, agrosque suos pro alienis populandos objicere. Sedato tandem fremitu responsum legatis est, "neque Romanorum in se meritum esse neque Carthaginiensium injuriam, ob quae aut pro Romanis aut adversus Poenos sumant arma: contra ea audire sese, gentis suae homines agro finibusque Italiae pelli a populo Romano stipendiumque pendere et cetera indigna pati." Eadem ferme in ceteris Galliae conciliis dicta auditaque, nec hospitale quicquam pacatumve satis prius auditum quam Massiliam venerunt.—*Livy*, B. XXI.

1. Parse *ortus, sumant, pendere, pati*.
2. Explain the syntax of *petissent, natu, censere, Massiliam*.
3. Distinguish *juventus* and *juventas*; *pendere* and *pendere*.

II.

Translate :

Æneas, primique duces, et pulcher Iulus, Corpora sub ramis deponunt arboris altae; Instituantque dapes, et adorea liba per herbam

Subjiciunt epulis (sic Jupiter ille monebat), Et Cereale solum pomis agrestibus augent. Consumptis hic forte aliis, ut vertere morsus Exiguam in Cerecer penuria adegit edendi, Et violare manu malisque audacibus orbem Fatalis crusti, patulis nec parcere quadris: "Heus! etiam mensas consumimus?" inquit Iulus,

Nec plura, alludens. Ea vox audita laborum Prima tulit finem; primamque loquentis ab ore

Eripuit pater, ac, stupefactus numine, pressit. Continuo: "Salve, fati mihi debita tellus; Vosque," ait, "o fidi Trojae salvete Penates. Hic domus, haec, patria est. Genitor mihi talia (namque

Nunc repeto) Anchises fatorum arcana reliquit—" —*Virgil Æneid*, B. VII.

1. Parse *augent, vertere, adegit, edendi, parcere*.
2. Change into *oratio obliqua* from *Salve* to the end of the extract.
3. Give a short account of Virgil's life.

III.

Translate :

Ille potens sui
Lætusque deget, cui licet in diem
Dixisse, "Vixi: cras vel atra
Nube polum Pater occupato,
Vel sole puro; non tamen irritum
Quodcumque retro est, efficit, neque
Diffinget infectumque reddet,
Quod fugiens semel hora vexit.
Fortuna sævo læta negotio et
Ludum insolentem ludere pertinax
Transmutat incertos honores,
Nunc mihi, nunc alii benigna.
Laudo manentem; si celeres quatit
Pennas, resigno quæ dedit et mea
Virtute me involvo probamque
Pauperiem sine dote quæto—"

—*Horace, Odes*, B. III.

1. Parse *sui, deget, vixi, diffinget, reddet, vexit*.

2. Derive *occupato, irritum, infectum*.
3. Give a scale of the metre.

Senior Matriculation.

LATIN—HONORS.

Examiner—J. Fletcher, M.A.

I.

Translate:

Is pavor perculit Romanos; auxiliumque pavorem consulis vulnus, periculumque intercurso tum primum pubescentis filii propulsatum. Hic erat juvenis penes quem perfecti hujusce belli laus est, Africanus ob egregiam victoriam de Hannibale Poenisque appellatus. Fuga tamen effusa jaculatorum maxime fuit, quos primos Numidae invaserunt: alius confertus equitatus consulem in medium acceptum, non armis modo, sed etiam corporibus suis protegens, in castra nusquam trepide neque effuse cedendo reduxit. Servati consulis decus Coelius ad servum natione Ligurem delegat: malim equidem de filio verum esse, quod et plures tradidere auctores, et famo obtinuit. —*Livy*, B. XXI.

1. Parse *perculit, auxilium, confertus, delegat, malim*.
2. Write notes on *Africanus, Coelius, Ligurem*.
3. *Servati consulis decus*. Explain and illustrate the difference between Latin and English idiom in the use of verbal nouns.
4. Sketch briefly the career of Hannibal down to the battle of Cannæ.

II.

Translate:

Ubi hoc quaestori Caecilio, viro optimo et homini aequissimo, nuntiatum est, vocari ad se Agonidem jubet: iudicium dat statim: Si paret eam se et sua Veneris esse dixisse. Judicant recuperatores id, quod necesse erat: neque enim erat cuiquam dubium quin illa dixisset. Iste in possessionem bonorum mulieris intrat: ipsam veneri in servitutem adjudicat: deinde bona vendit: pecuniam redigit. Illa dum pauca mancipia Veneris nomine ac religione retinere vult, fortunas omnes libertatemque suam istius injuria

perdidit. Lilybaeum Verres venit postea : rem cognoscit : factum improbat : cogit quaestorem suum pecuniam, quam ex Agonidis bonis redegisset, cum mulieri omnem adnumerare et reddere. Est adhuc, id quod vos omnes admirari video, non Verres, sed Q. Mucius. Quid enim facere potuit elegantius ad hominum existimationem, aequius ad levandam mulieris calamitatem, vehementius ad quaestoris libidinem coercendam? Summe haec omnia mihi videntur esse laudanda. Sed repente e vestigio ex homine tamquam aliquo Circaeο poculo factus est Verres : redit ad se atque ad mores suos. Nam ex illa pecunia magnam partem ad se vertit, mulieri reddidit quantum visum est.

—Cicero, *In Caecilium*.

1. Write short notes on *quaestori, recuperatores, Lilybaeum, Mucius*.
2. *Circaeο poculo*. Explain.
3. Explain the following legal terms: *postulatio, nominis delatio, subscriptio, divinatio*.

III.

Translate :

Sin ad bella magis studium turmasque feroces,
 Aut Alpheā rotis praelabi flumina Pisae,
 Et Jovis in luco currus agitare volantes ;
 Primus equi labor est animos atque arma videre
 Bellantum, lituosque pati, tractuque gementem
 Ferre rotam, et stabulo frenos audire sonantes ;
 Tum magis atque magis blandis gaudere magistrī
 Laudibus, et plausae sonitem cervicis amare.
 Atque haec jam primo depulsus ab ubere matris
 Audeat, inque vicem det mollibus ora capistris
 Invalidus, etiamque tremens, etiam inscius aevi.
 At tribus exactis, ubi quarta accesserit aestas,
 Carpere mox gyrum incipiat, gradibusque sonare
 Compositis, sinuetque alterna volumina crurum,
 Sitque laboranti similis; tum cursibus auras,
 Tum vocet, ac per aperta volans, ceu liber habenis,
 Æquora, vix summa vestigia ponat arena.
 —Virgil, *Georgics*, B. III.

1. Explain the allusion in *Alpheā, Pisae, Jovis in luco*.
2. Give the exact force of *mollibus, laboranti similis*.
3. *Inscius aevi*. What different interpretations?
4. Discuss briefly the style of the *Georgics*, illustrating from the Third Book.

IV.

Translate :

Falso queritur de natura sua genus humanum, quod, imbecilla atque aevi brevis, forte potius quam virtute regatur. Nam contra reputando neque majus aliud neque praestabilius invenias, magisque naturae industriam hominum quam vim aut tempus deesse. Sed dux atque imperator vitae mortalium animus est, qui, ubi ad gloriam virtutis via grassatur, abunde pollens potensque et clarus est, neque fortuna eget, quippe probitatem, industriam aliasque artis bonas neque dare neque eripere cuiquam potest. Sin captus pravus cupidinibus ad inertiam et voluptatis corporis pessum datus est, perniciose lubricine paullisper usus, ubi per socordiam vires, tempus, ingenium diffluxere, naturae infirmitas accusatur; suam quisque culpam actores ad negotia transferunt. Quod si hominibus bonarum rerum tanta cura esset, quanto studio aliena ac nihil profutura multumque etiam periculosa petunt; neque regerentur magis quam regerent casus, et eo magnitudinis procederent, ubi pro mortalibus gloria aeterni fierent.—Sallust, *Jugurtha*.

MODERN LANGUAGES.

JOHN SEATH, B. A., ST. CATHARINES, EDITOR.

NOTE.—The Editor of this Department will feel obliged if teachers and others send him a statement of such difficulties in English, History, or Moderns, as they may wish to see discussed. He will also be glad to receive Examination Papers in the work of the current year.

ENGLISH.

Answers to the questions received by the Editor of this Department of THE MONTHLY, from want of space, are held over until next issue.

FRENCH.

EDUCATION DEPARTMENT,
ONTARIO.

JULY EXAMINATIONS, 1892.

*Intermediate.*Answered by Mamie E. Huddlestone,
St. Catharines.

I.

I. General Rule: The feminine of adjectives is formed by adding *e* mute to the masculine singular.

(1) Adjectives ending in *e* mute remain the same for the feminine—*Le jeune fils, La jeune fille.*

(2) Adjectives ending in *f*, change *f* into *ve* for the feminine—*Vif, vive.*

(3) Adjectives ending in *x* change *x* into *se* for the feminine—*Heureux, heureuse.*

(4) Adjectives ending in *el, cil, ien, on* and *et* double the final consonant, and add *e* mute—*Bon, bonne.*

(5) Adjectives ending in *eur*, formed from a present participle by changing *ant* into *eur*, make *euse* for the feminine—*Trompeur, trompeuse.*

(6) Adjectives ending in *eur*, not derived from verbs, and conveying an idea of *opposition* or *comparison* follow the general rule, and add *e* mute—*Mineur, mineure.*

II. *On dit qu'il est riche*—*They say he is rich.*

On pense que nous aurons bientôt la paix—*It is thought that we shall soon have peace.*

L' is used before *on* after the words *et, si, où, que, qui,* and *quoi*; but if *on* is followed by *le, la* or *les*, we do not use *L'*.

III. If the subject of the sentence is a pronoun it is placed after the verb, to which it is joined by a hyphen. *Is she gone?* *Est-elle allée?*

(1) When the third person singular ends in a vowel *t* is inserted between the verb and pronoun—*A-t-elle?*

(2) When the verb used interrogatively ends with a mute *e* in the first person singular, that *e* takes an acute accent—*Chanté-je?*

(3) When the first person singular of a

verb used interrogatively is a monosyllable, instead of the usual form, *est-ce que* is used, followed by the nominative pronoun and the verb—*Est-ce que je vends?*

(4) When the subject of the verb is a noun, it is placed first in the sentence, and a pronoun corresponding in person and number is placed after the verb—*Vos sœurs chantent-elles?*

IV. *Y avoir.*

Ind. present Il y a.
 Pret. indef. Il y n eu.
 Ind. imperfect. Il y avait.
 Pluperfect Il y avait eu.
 Ind. pret. def. Il y eut.
 Pret. ant. Il y eut eu.
 Ind. fut. Abs. Il y aura.
 Fut. ant. Il y aura eu.

Falloir.

Subj. present Qu'il faille.
 Pret. Qu'il ait fallu.
 Subj. Imperf. Qu'il fallût.
 Pluperf. Qu'il eût fallu.

Ouvrir, ouvrant, ouvert, J'ouvre, J'ouvris.
 Tenir, tenant, tenu, Je tiens, Je tins.
 Naître, naissant, né, Je nais, Ja naquis.
 Croire, croyant, cru, Je crois, Je crus.
 Dire, disant, dit, Je dis, Je dis.

V. (1) When the adjective ends in a vowel in the masculine, the adverb is formed by adding *ment*—*Sage, sagement.*

(2) When the adjective ends with a consonant in the masculine, the adverb is formed by adding *ment* to the feminine—*Heureux, heureusement.*

(3) Adverbs are formed from adjectives ending in *ant* or *ent*, by changing *ant* into *amment*, and *ent* into *emment*.

Constant—constamment.
 Éloquent—éloquemment.

Sing. Plural.

VI. *Chef-lieu, chefs-lieux*; county town.

Hôtel-Dieu, Hôtels-Dieu; a name given to the principal hospital of several towns in France.

Chef-d'œuvre, chefs-d'œuvre; masterpiece.

Coq-à-l'âne, coqs-à-l'âne; nonsensical story.

Contre-coup, contre-coups; counter-blow.

Passe-partout, passes-partout; pass key.

VII. *I, thou, he, they (m)*, are translated *moi, toi, lui, eux* :—

- (1) When used as the answer to a question.
- (2) When joined to a noun or pronoun by a conjunction, or when a verb has two or more pronouns for subjects.
- (3) When they come after a comparative.
- (4) When followed by the relatives *qui, que*, the adjective *seul*, or a present participle.
- (5) When marking opposition or distinction, or when pointing out the part taken in an action by different persons.
- (6) When coming after any part of the verb *être*, used with *ce*.

VIII. The subjunctive is used :—

- (1) After verbs expressing *doubt, fear, surprise, admiration, will, wish, desire, consent, or command*.
- (2) After an interrogation, and after a verb accompanied by a negation.
- (3) After impersonal verbs, or those used impersonally.
- (4) After the relative pronouns *qui, que, dont*, etc., when they are preceded by *peu*, or by an adjective in the *superlative relative* degree.

(5) The subjunctive is also used after the relative pronouns *qui, que, dont*, etc., when we wish to express doubt and uncertainty.

(6) Also after *quel, que, quelque...que, qui, quoi*.

IX. (a) Avec qui demeurez-vous ?

(b) Il y a en France quatre-vingt six chefs-lieux de département.

(c) Ce que je crains, c'est de vous déplaire.

(d) Ni l'un ni l'autre n'obtiendra la prix.

(e) Tout beau, Monsieur, parlez de lui avec plus de respect.

X. Louis neuf se montra un prince destiné à réformer l'Europe, si l'Europe pouvait être réformée ; à rendre la France triomphante et bien gouvernée et à être dans toutes les choses, le modèle des hommes. Sa pitié, qui était celle d'un anachorète, ne le priva pas de quelque vertu de roi. Il savait accorder la politique profonde avec la justice stricte, et peut-être est-il le seul souverain qui mérite cette louange.

II.

(a) What am I going to do, pray, among

these bold financial speculators ! A poor sparrow born beneath the eaves, I would always be in dread of the enemy concealed in the dark corner ; a prudent worker, I would be thinking of the luxury of my neighbour which had so suddenly disappeared ; timid observer, I would be recalling the flowers slowly raised by the old soldier, or the shop ruined from having changed masters ! Away from me be the feasts above which hangs the sword of Damocles, I am a country rat ; I mean to eat my nuts and bacon seasoned with security.

(1) *Craindrais*, a verb, irregular, 4th conj. ; Cond. mood, present tense, 1st pers. sing. *Craindre, craignant, craint, je crains, je crainis.*

(2) *Loin de moi soient les festins.*

(3) *Damocles*, a courtier of Dionysius, was always enjoying his master's happiness. The latter invited him to dinner, robed and treated him like a prince, but had a sword suspended by a single horse-hair placed over his head, in order to show him what a ruler's happiness was.

An allusion to La Fontaine's "Le Rat de ville et le Rat de Champs."

(b) Intoxicated by the fresh air, by the penetrating perfume of the flowing sap, by the fragrance of the honey-suckle, he would walk on until hunger and fatigue made themselves felt. Then he would sit down by the border of a thicket or of a brook ; water-cresses, wild straw-berries, black-berries, by turns, would furnish him with a rustic feast ; he would gather a few plants, read a few pages of Florian, then just come into vogue, of Gessner, who had just been translated, or of Jean-Jacques, of whom he possessed three odd volumes. The day would be passed in alternations of activity and rest, of search and of reveries, until the sun, by its decline, warned him to retrace his way to the great city, where he would arrive, his feet bruised and dusty, but his heart cheered for a whole week.

(1) *Lisait quelques pages*, means read a few pages.

Lisait des pages, means read some pages—many or few.

(2) *Venait d'être*—Had just been.

Venait à être—Happened to be.

(3) *Avertit*—A verb, regular, 2nd conj., subj. mood, imper. tense, 3rd sing., agreeing with its subject, *soleil*.

(4) *Florian*, a French writer and poet, born in 1755, died in 1794. As a writer of fables, he ranks after La Fontaine.

Gessner, a writer and artist, born at Zurich 1730, died in 1787. Chief works are his "Idyls" and a poem, "The death of Abel."

Jean-Jacques Rousseau, born at Geneva in 1712, died near Paris in 1778. Came to England in 1766, to escape persecution, caused by his "*Emile*."

The grasshopper, having sung all the summer, found herself entirely destitute when winter (north wind) came, not a single little piece of fly or of grub. She went and cried famine at the house of her neighbour, the ant, praying her to give her some grain to live on until the new season. "On the honor of an animal, I will pay you," said she, "before August, both interest and principal." The

ant is not a lender; this is her least fault.—"What were you doing in the warm weather?" said she to this borrower.—"Night and day, to all comers, I was singing; do not be angry."—"You were singing; I am very glad of it. Well, dance now."

(1) *Depourvue*, a past participle feminine, agreeing with *se*, from *depourvoir*, *depourvoyant*, *depourvu*.

Venu, a past participle feminine, agreeing with *bise*, from *venir*, *venant*, *venu*, *je viens*, *je vins*.

Foi, a noun of the feminine gender, objective case, governed by *sur*, understood (*sur la*) *foi*.

Déplaise, the third person singular, present subjunctive, agreeing with (*il*) from *déplaise*, *déplaisant*, *déplu*.

(2) *Petit*, *moindre*, *le moindre*, or *plus petit*, *je plus petit*.

Chaud, *plus chaud*, *le plus chaud*.

Petit, *moindre*, *le moindre*.

(3) *J'en suis fort aise*, equals *Je suis fort aise que vous chantiez*.

SCHOOL WORK.

DAVID BOYLE, TORONTO, EDITOR.

NORTH HASTINGS UNIFORM PRO- MOTION EXAMINATIONS.

(Continued from page 399.)

GEOGRAPHY.

I. Sketch an outline map of North America, locating Belleville, Winnipeg, Sable, Montreal, Chicago, Mackenzie, Canso, Vancouver, James Bay, Hayti, Nelson, Nicaragua.

II. Name the counties of Ontario bordering on Lake Erie; name also the county town of each of these counties.

III. Name the chief rivers flowing into the North and Mediterranean Seas.

IV. In sailing from Gibraltar to Ceylon *via* Malta, near what important places would you pass?

V. What are the chief exports of England, Italy, Spain, Canada, and China?

VI. Name the principal mountain ranges of Asia.

VII. Compare the climate of Madoc with that of Ireland, noting distinctly the points of difference. Give reasons for these differences.

VIII. In going by rail from Stirling to Toronto, through what towns and villages would you pass?

GRAMMAR.

One hundred marks to count a full Paper.

Subject.	Modifications of Subject.	Grammatical Predicate.	Object.	Adverbial Modifications of Predicate.
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I. Analyze, according to the plan given above, the following sentences:—

- (i.) The moon threw its silvery light upon the rippling waters of the lake.
- (ii.) *Out steps with cautious foot and slow,*
And quick, keen glances to and fro,
The outlaw.

II. Parse the italicized words in the above.

III. Define accurately: relative pronoun, common noun, transitive verb, nouns in apposition, case, and analysis.

IV. Write the plural of gas, tax, money, society; the possessive plural of sheep, oxen, potato, aunt; the comparative and superlative of sweet, sweetly, late, evil, plentiful, happy.

V. Correct the following where necessary:

- (i.) The ladies is sewing.
- (ii.) The ladie's sewing-society has met.
- (iii.) He saw five deers' bones.
- (iv.) John and James has gone.
- (v.) Jane is the tallest of the two.
- (vi.) Two villages has been built.
- (vii.) I aint well to-day.

VI. Write a sentence in which the subject is modified by an adjective or adjectives], by a noun in the possessive case, and by an adjective phrase: and in which the predicate is completed by an object, and by an adverbial phrase.

LITERATURE.

I. Write the following passages, using instead of the words and phrases in italics other words or phrases which will not change the meaning:—

- (i.) This place was the *scene of a tragedy of more recent occurrence.*
- (ii.) *Through vigorous exertion they might reach the bank perilously near the fall.*
- (iii.) Hast thou *witnessed* the angels' *bright employ?*
- (iv.) They are *dreadfully superstitious.*
- (v.) The *intelligence was received with amazement and horror.*
- (vi.) The *crashing of the fragments rivals* the noise of the falls.
- (vii.) Their *stupidity rendered it of no avail.*
- (viii.) England had *long regarded her naval supremacy as indisputable.*

II. Explain clearly the meaning of the following:—

- (i.) The pleasures were far from exciting.
- (ii.) He was in easy circumstances.
- (iii.) One of the most stirring episodes.
- (iv.) I was credibly informed.
- (v.) And yet his chiefest comeliness is his sweet and serious air.
- (vi.) There are teachings on earth, and sky, and air.

III. Who is called [lesson on the Battle of Queenston Heights] the "hero of Upper Canada?"

IV. Tell what you know of the following:—The Six Nations, William Penn, Montreal, Sir John Moore, Hudson Bay Company, Pontiac.

ARITHMETIC.

Full work required. Full marks to be given for correct solutions only. If the answer be nearly correct and the method quite correct, from 10 to 50 per cent. of the value may be given. In marking, neatness of arrangement, etc., should be taken into account. One hundred marks to count a full Paper.

I. Define multiple, H. C. F., improper fraction, abstract number, vulgar fraction.

II. A farm contains 127 acres, 142 sq. rods, 19 sq. yards. Of this, 19 acres, 158 sq. rods, 4 sq. feet are not cleared. The remainder is divided into fields each containing 8 acres, 29 sq. yards. How many fields are there?

III. Make out neatly a bill of the following:—James Hubbel bought of James Whytock,

- 41 lbs. oats, at 50 cts. per bushel,
- 65 lbs. rye, at 92 cts. per bushel,
- 9 lbs. 7 oz. meat, at 11 cts. per lb.,
- 47 eggs, at 13 cts. per doz.,
- 149 ft. of lumber, at \$9.50 per 1000 ft.

IV. From what number must we take $3\frac{1}{2} + 1\frac{1}{2} - 2\frac{1}{2} + 4\frac{1}{2}$ to leave $7\frac{1}{2} + \frac{1}{4} + 6 + \frac{1}{4}$?

V. A farmer divides a farm of 480 acres among his three sons, John, James, and Henry. To James he gives twice as much as to John, and to Henry half as much again as James gets. How much does each get?

VI. A can dig 4 rods of ditch in a day, B can dig 8 rods, and C can dig 6 rods; what must be the length of the shortest ditch that

will furnish exact days' labour either for each working alone, or for all working together?

VII. If wine is bought at \$4.50 a pipe, and sold at \$10.50 for a dozen bottles, a gallon filling six bottles, what is lost or gained, the expense of bottles being 55 cents a dozen? [A pipe contains 126 gallons.]

Entrance to Senior Fourth Class.

LITERATURE.

One hundred marks to count a full Paper.

I. Write the following extracts, substituting for the words in italics other words or phrases which will make sense:—

(i.) With "London" *blazoned* on the *boot*.

(ii.) Some years *ago* a *warehouseman* in Manchester, England, *published* a *scurrilous pamphlet*, in which he *endeavoured* to hold up the house of Grant Brothers to *ridicule*.

(iii.) The brothers held an *acceptance* of his *which had been endorsed by the drawer*.

(iv.) The Spaniards could *scarcely believe their senses*; it *seemed* more like a *splendid vision than reality*; Montezuma *appropriated* to their use *magnificent accommodations*.

(v.) Meat is *the staff of life*.

(vi.) With *reverence meet*.

(vii.) Where the light of *Phœbus* travels bright the world o'er.

II. Tell what you know about the Buccaneers, General Brock, Tecumseh, Mrs. Moodie, Mrs. Traill, Lord Elgin, John Cabot.

III. What is referred to in the following italicized extract from the "Song of the Emigrants in Bermuda?"—"He lands us safe from the prelate's rage."

IV. "Which seemed to *him who dwelt in Patmos for his Saviour's sake*." Who is meant? Explain the allusion.

V. I was "*the Hansard*" of my own speech. Explain the passage.

VI. What is meant by a *coffer dam*, and by *internal communication*?

GRAMMAR.

One hundred marks to count a full Paper.

I. Analyze fully the following stanza:—

His hair is crisp, and black, and long,
His face is like the tan:

His brow is wet with honest sweat;
He earns *what'er* he can,
And looks the *whole* world in the face,
For he owes not any man.

II. Parse the words in italics in the stanza given above, and in the following passages:

(i.) History is *philosophy teaching* by examples.

(ii.) *The daughter* of a hundred earls,
You are not one to be desired'.

III. Define simple sentence, compound sentence, complex sentence, phrase, analysis and parsing.

IV. Write the second singular of the verb *run* in each of the tenses of the indicative mood.

V. Correct any mistakes that occur in these sentences, and give reasons for your corrections:—

(i.) *He* has come to school lately.

(ii.) Who are you looking for?

(iii.) He did a great deal of harm.

(iv.) That house there ought to be painted.

(v.) My sister has went to Marmora.

(vi.) Beef is the flesh of the ox, which is usually salted.

COMPOSITION AND WRITING.

The answer to the first question will be taken as a specimen of penmanship. Value of Writing, 50 marks.

I. Combine the following statements into one simple sentence:—

The boy wrote. He was a good boy. He wrote a letter. He wrote to his father. He wrote from school. He wrote on his birthday. It was a long letter. He wrote it early in the morning. He wrote it before breakfast.

II. Combine the following statements into one complex sentence:—

A frog had seen an ox. She wanted to make herself as big as he. She attempted it. She burst asunder.

III. Combine the following simple sentences so as to form a connected narrative composed of not more than four sentences:—

An old man was on the point of death. He called his sons to his bedside. He ordered them to break a bundle of arrows. The young men were strong. They could

not break the bundle. He took it 'n his turn. He untied it. He easily broke each arrow singly. He then turned towards his sons. He said to them. Mark the effect of union. United, like a bundle, you will be invincible. Divided you will be broken like reeds.

IV. John Mann owes William Graham twenty-five dollars and twenty cents, and on the 15th of May, 1882 he pays the debt in full. Write a receipt.

Milne and Clute, Stirling, sell, on June 29th, 1882, to Michael Moran, 10 lbs. tobacco at 50 cents, 8 lbs tea at 44 cents, 12 lbs. sugar at 11 cents, and 29 lbs wrought nails at 9 cents. Make out an account.

HISTORY.

I. In what respects do the majority of the inhabitants of the Province of Quebec differ from the majority of the inhabitants of Ontario?

II. Give a brief account of the siege of Quebec in 1775-76.

III. What causes led to the passing of the following Acts:—Quebec Act, Constitutional Act, Confederation Act? Mention the principal provisions of each.

IV. Explain sheriff, recve, warden, premier, mayor, Speaker of the House of Commons.

V. Describe briefly the American War of 1812, distinguishing the victories won by the British.

VI. Mention the chief events of public interest that occurred in Canada between 1830 and 1867.

WEST GREY PROMOTION EXAMINATIONS.

READING.

Junior II.

P. 116—From "Christmas Morning" to "by our heads." P. 73—Things to be kept in mind—verses 1-3.

Senior II.

P. 140—"Take care" said Wolfe, to "left them and went away." P. 137—Meddlesome Matty—verses 2 and 3.

Junior III.

P. 100—Sagacity of the Sheep—from beginning to "she stood still." P. 31—The Miser punished—from beginning to "The Justice will decide between us."

Senior III.

P. 195—Loss of Schooner—"Another great wave" to "must devour them." P. 262—My Neighbour—verses 1-3.

SPELLING.

Junior III.

P. 71—A Ghost Story—from "The men held their breath," to "knocked my hat off."

P. 131—Lion Hunting—from "Suddenly the appalling" to "a runaway web-spinner."

Phrases.—An intelligent scholar—A sudden squall—That vicious creature—An immense army corps—Such a pleasant countenance—A parallel case—A powerful propeller—An ingenious invention.

Additional to the above for Senior III.

P. 245—From "In the blockhouse" to "gateway."

Junior II.

Jealousy of Joseph. Round we circle in a sphere. Sure enough he stood at Granny's door. Laughed at all her naughty ways. Smeared with crying. O'er the summer's scented clover. P. 43—"When Jacob" to the end.

Additional for Senior II.

Presence of mind. Striking out lustily. The deliberate opinion of a gray-headed man. From the tongue unbridled slip. Painting the ceiling. P. 146—"So the two armies" to "their God."

Two marks to be deducted for each mistake in spelling.

Pronunciation, distinctness, pauses and expression to be considered in the reading.

ARITHMETIC.

Junior II.

1. Add thirty-seven, four hundred and nine, six thousand and fifty-eight. XCVI' and 8.

2. Find the value of 34567 - 849683 +

2. Define: noun, adjective, verb, pronoun, preposition.

3. Parse the nouns, adjectives, and pronouns in the following sentences :

(a) He is a very good boy.

(b) He gave me a penny.

(c) We are dutiful children.

(d) He obeyed his teacher.

4. Divide into subject and predicate :

(a) Great are the works of God.

(b) With many kisses she greeted her friends.

(c) He gave him to his uncle.

(d) We came from London.

5. Correct the errors in the following sentences :

(a) Him and me is going to the show.

(b) Them's my apples.

(c) Come yere John !

(d) The pole is sixteen foot long.

(e) Is you going to school to-morrow ?

(f) My boots is better than yourn.

COMPOSITION.

1. Write simple sentences on the dog, the horse, barley, a cold day, the bright sun, my mother, a kind teacher.

2. Complete the following sentence by supplying a noun : (a) "The _____ sails on the bay." Complete the following sentence by supplying a verb : (b) "The warm sun _____ the grain." Complete the following sentence by supplying an adjective : (c) "The _____ moon looks beautiful."

3. Arrange these words so as to make a sentence : John—nest—field—eggs—large—a—hay—the—found—of—in.

GRAMMAR.

Senior III. to IV.

1. Define : relative pronoun, interjection, transitive verb, irregular verb, regular verb, personal pronoun, case, gender, number, voice.

2. Decline the pronouns I, he, she, it.

3. Compare good, rich, square, circular, bad, happy, excellent immortal.

4. Parse the words in the following stanza :

"Now I lay me down to sleep,
I pray the Lord my soul to keep ;
If I should die before I wake,
I pray the Lord my soul to take."

5. Analyse the above, telling the kind of sentences.

6. Correct the following sentences :

(a) Me and John is going to the country.

(b) Is you the boy the master licked yesterday.

(c) Them apples is splendid.

(d) This book is her'n.

(e) Set down and tell us the news.

(f) I ai'nt going to give you none.

(g) Take them books out a your bag.

COMPOSITION.

1. Define phrase, syllable, letter, clause, sentence.

2. Complete, using phrases : (a) He came _____ . (b) He _____ succeeded. (c) _____ the snow does not melt. (d) Come _____ and see the beautiful flowers.

3. Write a letter to a friend describing the place where you live.

4. Write a simple sentence on each of the following : (a) A bad boy ; (b) A kind father ; (c) The ocean ; (d) A willing girl ; (e) An honest man.

GEOGRAPHY.

Junior II. to Senior II.

1. What is a bay? a county? a sea? a cape? a river? Tell names of two bays, countries, etc.

2. What is an island? In your definition if you had written *land* instead of *water*, and *water* instead of *land*, of what would it be a definition then?

3. In what School Section is your school? What Township? What part of the Township? What is the name of the nearest post office? How is your Township bounded on the N., E., S., and W.?

4. Draw plan of the school house, marking on it the door, ante-rooms, if any, the teacher's desk, the stove, and the N., E., S. and W. sides or ends.

5. Name the principal things that are sold by the farmers in your neighbourhood.

Junior III.

1. (a) Define : Isthmus, meridian, equator, parallel of latitude, archipelago, desert. (b) Define tropics, name them, and tell where they are situated.

2. Name continents in order, commencing with the smallest.

3. What bodies of water between Ontario and the United States?

4. Draw a map of the County of Grey, showing boundaries, townships, towns and railroads.

5. What and where are Goderich, Anticosti, Winnipeg, Chicago, Panama, Hayti, Cape Horn, Baltic, Japan, Mediterranean, Athabaska?

6. What is the capital of each of the following: Canada, New Brunswick, British Columbia, Mexico, Prince Edward Island?

7. Name principal mountains in North America.

8. Locate the following: Gulf of California, Labrador, Bay of Bengal, Red Sea, Cape St. Roque, Sault Ste. Marie, Vancouver's Island, Lake Nipissing, Gulf of Georgia, Great Bear Lake, Cabot Head, Orinoco.

Senior II. to Junior III.

1. Tell what is meant by each of the following terms, and give two examples of each: peninsula, bay, cape, strait, isthmus, sea, lake, volcano.

2. (a) Draw a map of your Township. Show how it is bounded. Mark as nearly as you can the position of your school house on it and of rivers and railroads running through it. (b) Which concession is nearest to your school, and in what direction does it run?

3. Name the principal things raised and manufactured for sale in your section, and tell where they are chiefly sold.

4. Tell what you know about the Dominion of Canada and its provinces, and name the principal rivers and lakes.

5. Draw a river showing the source, tributaries, basin, bed, mouth.

Senior III.

1. (a) Define: longitude, tropics, zone, cape, zenith, plateau. (b) What causes the succession of the seasons? Name the motions of the earth, and tell which produces day and night.

2. (a) Draw a map of Ontario? (b) Mark on the map the position of Kingston, Toron-

to, Hamilton, London, Ottawa, and Owen Sound.

5. Name countries of South America bordering on the Pacific Ocean, and give the capital of each.

4. In what provinces of Canada do we find coal, salt, petroleum, silver, iron?

5. Name in order, commencing at the West, the Counties of Ontario bordering on Lake Erie, with County Town of each.

6. Into what waters do the following Rivers empty: Saskatchewan, Rio de la Plata, Fraser, Nelson, Mackenzie, Ottawa, St. John, Mississippi, Grand?

7. Through what waters would a vessel pass in sailing from Owen Sound to Kingston?

8. What and where are Duluth, Hatteras, Charlottetown, Belleisle, Yucatan, Madagascar, Altai, Sicily, Sahara, Tierra del Fuego, Volga, Nile?

LITERATURE.

Junior II.

1. Explain the meaning of "hungry and gaunt," "frisk and scamper all the day," "Never give up the substance for the shadow," "Cheer of Mind."

2. Tell the story of the Cat and Cream-jug.

3. Give meanings of "inclined," "ascent," "dainty," "requesting," "wilful," "tinkle."

4.

"The wolf would have killed her, but *shrilly*
Her loud cry *pierced the wood*,
And the brave woodman came and *slew* him,
And saved Red Riding Hood."

Define the words in italics. What is a wolf like? What did this wolf do? Who was Red Riding-Hood? Where was she going? What did she have with her?

Senior II.

1. Explain: "Gathering all his energies," "in spite of all obstacles," "redoubled his efforts," "pallid fears distracting power."

2. Tell the story of the Bold Boy and the Coward. Which of the boys turned out to be the brave one?

3. Write out the poem By-and-Bye. Define: "endeavour," "treacherous wooing,"

"pilot," "faithless guidance," "thwarting every undertaking."

4. "The bird that soars on highest wing
Builds on the ground her lowly nest,
And she that doth most sweetly sing,
Sings in the shade when all things rest."

What is meant by "soars on highest wing?" Name these two birds and tell what each is noted for.

Junior III.

1. Explain: "Jacko's insectivorous propensities," "placed in a terrible predicament," "bounteously rewarded for our anxiety," "thus arrest the descending *detritus*," "Nor was his companion less tardy," "the pursuit grew hotter." Name the lesson in which each of these phrases is.

2. In what relation does the dog stand to man? What marks of character are common to all kinds? How many varieties are there? Name four. Tell the story about the one of the Newfoundland kind, related in the lesson on "The Dog."

3. Define "turret," "sagacity," "decoy," "ambuscade," "renegade," "domesticated," "foster-parents."

4. Who was Francesco Michelo, Latreille, Antony Canova? Where is St Anne, Dundee, Kentucky?

Senior III.

1. Explain: "sign of acquiescence," "incur a terrible penalty," "impossible to land the siege artillery," "betrayed by a mutinous Swiss," "indescribable feeling of awe," "the quadrangle of a wooden fort," "frantic gestures appealing for aid," "a solitary grave," "an agonizing night," "singularly enthusiastic."

2. "I am monarch of all I survey,
My right there is none to dispute,
From the centre all round to the sea
I am lord of the fowl and the brute."

Who is speaking here? Who was he? Why was he monarch of all he surveyed? What *centre* is referred to? What sea? What is meant by "lord?" What do "fowl" and "brute" include? Give the remainder of this stanza.

3. Who was Pontiac, Sir Isaac Brock, General Amherst, Madame La Tour? Where is Acadia, Vancouver's Island, "the Polar regions," "the Gulf-stream?"

4. Give an account of the battle of Queenston Heights.

ARITHMETIC TO TABLET CLASSES.

BY J. O. M., MADOC.

TEACHERS do not, as a rule, appreciate the symmetry of the forms of numbers, as presented in the well-known game of *dominoes*. If they once tried to teach analysis with the aid of these figure-pictures they would discard the ordinary methods for once and all. We do not pretend to originality in this. The method is advocated in at least one educational work: here we merely wish to emphasize its importance.

Analysis, addition, and subtraction may be taught with the greatest ease and interest to the class by this means. Take for example the picture of 5 :: Let the class call it a picture; they will the more readily distinguish the number from the figure. Analyse first: Of what is this picture composed? The class at once will see (having of course been taught the pictures up to five), that it is made up of . . and . . . Of what other picture is it composed? Of :: and . . . Any other? Yes; . . and . . and . . . Now tabulate these results: $3+2=5$; $4+1=5$; $2+2+1=5$. Then proceed with subtraction. If I remove the picture of two what is left? The picture of *three*. If I take away the picture of *one* what remains? The picture of *four*. Then tabulate results as above.

By way of variety form figure-pictures of members of the class, upon the floor. Be a *dot* yourself and help to fill up the picture. The interest and enthusiasm of your pupils will amply repay you. Use no technical terms with a class of this size. Do not use *abstract* numbers until the pupils are familiar with *concrete*.

In testing, make the pupils place the figure beside the picture; they will thus associate the concrete with the abstract. Continue this, or an adaptation of the method,

up to *twenty*. Do not confine yourself to making pictures on the board. Use the ball-frame. Allow the pupils to place the balls upon the wires, in the required positions. A nice exercise for seat-work is to get the class to draw certain of these figure-pictures on their slates, making very light dots, and then join the dots by horizontal, oblique, and perpendicular lines. This will make them careful to place the dots in the proper position, and it is also an exercise in drawing.

The following makes an excellent *drill* in numbers: Place a large number of beans on a slate. Passing down the class tell each pupil to take off a certain number, say six. He must not be allowed to count the beans as he takes them off; but take as many as he thinks to be six, in his hand, at once. Then call upon number *one* to say how many he has taken off. Probably he will have taken too few or too many. Place his name on the board, and beside it the number he has taken off. So on with the rest. Then question. Q. How many should you have taken? A. Six. Q. How many did John take? A. Four. Q. How many must we add to his four beans to make six? A. Two. Put this on the board, which will show as follows: *John*— $4+2=6$. Q. How many did Jane take? A. Nine. Q. What is wrong here? Q. She took three too many. Q. How many must we take from her nine beans to leave six? A. Three. The board will then show: *Jane*, $9-3=6$.

This may be varied *ad infinitum*. To teach these classes, we must keep out of the ruts, and allow the little ones freedom of action. Monotony destroys the teacher's interest in his work, and cripples the intellect of his pupils.

THE following examples of bad composition have been selected from a number that were written by a class upon the subject of a visit to the Toronto Industrial Exhibition. It will be an interesting and instructive exercise for a class to correct or improve these:

Saturday, the 9th day of September, was appointed by the Exhibition Committee for

the children of the public schools. On Monday there was a schooner fitted up as a man-of-war blown up. The second shot made a large whole. I saw a large fountain of all colors which were made so by two large reflectors with sliding glasses of all colors. I saw some plants of rareness, besides a good collection of insects, coins and reptiles. I saw some very good collections of birds eggs. There were some very pretty things among which was a fountain which threw water which was intended to represent all the colors of the rainbow. The things which were exhibited were about the same as last year. I watched the races (Donkey and Horse).

The accompanying corrections were among those afterwards made by the class:

Saturday, the 9th of September, was appointed by the Exhibition Committee for the children of the public schools to visit the Exhibition. On Monday a schooner fitted up as a man-of-war was blown up (or a schooner fitted up as a man-of-war was blown up on Monday). I saw a large fountain the jets of which appeared as if they were of all colors, they were made so by sliding colored glasses in front of two large reflectors. I saw some rare plants besides good collections of coins, insects and reptiles. The objects exhibited were nearly the same as those exhibited last year.

IT is readily granted that the prize system has some good results. But it is worthy of earnest inquiry, whether all that is truly valuable in this respect may not be gained by the inevitable and healthy gradations of intellect in educational life, without the dangerous influences of the prize system. Let it be noticed, too, that the good effects of these expedients are readily seen, while the evils may not be apparent to the ordinary observer. The good is not extensive, while it is obvious; the evil is intensive, while it may be easily overlooked. This system may promote that knowledge that puffeth up, but not that charity that buildeth up.—*Prof. J. H. Carlisle, in the "New England Journal of Education."*

TEACHERS' ASSOCIATIONS.

NORTHUMBERLAND.—The Teachers of this county held a successful association meeting in the Collegiate Institute, Cobourg, on the 5th and 6th of October, the President, Mr. G. Dowler, in the chair.

The Association proceeded to discuss whether it would be in the interest of the profession in this county to continue the present system of semi-annual meetings, or to substitute therefor yearly meetings, and monthly or quarterly Township Associations. The question was finally laid over. The new P. S. programme was severely criticized by Mr. D. Robertson, whose essay on the subject elicited frequent applause. He was requested to submit it for publication. "School Hygiene" was discussed in a thoroughly practical manner by Mr. H. M. Hicks, B.A., of Colborne. The speaker enumerated among other causes of ill health to teachers and pupils a lack of cheerfulness on the part of the teacher; low school sites and the proximity of these to stagnant water; improper modes of lighting, heating and ventilation; defective seating accommodation for the sake of economy (?); sending children to school at too early an age, to their physical and mental detriment.

Mr. Geo. Kirk next illustrated in an interesting manner his method of presenting "Fourth Class Arithmetic." Mr. John McColl addressed the meeting on "Dull Pupils, etc." He attributed much of the dulness to artificial rather than to natural causes—improper ventilation of school rooms, irregularity of attendance and the foolish custom of sending pupils to school at a tender age *in order to get them out of the way*. In the evening Mr. J. L. Hughes, I. P. S., Toronto, delivered a lecture on the "Kindergarten."

Friday.—"Literature for Third and Fourth Classes" was introduced by Mr. D. E. Stephenson. Mr. W. S. Ellis, B.Sc., next gave numerous valuable "Short Methods in Arithmetic." An excellent paper in History by Mr. R. Ferguson, B.A., was, in the absence of that gentleman, read by Mr. Odium, B.A. A vote of thanks was tendered to each, and Mr. Ferguson was requested to allow his essay to be published. The sum of \$30 was voted to aid teachers in

procuring the Toronto Educational Journals. The following are the officers elected for the ensuing year:—Mr. W. S. Ellis, B.A., B.Sc., President; H. M. Hicks, B.A., Vice-President; D. E. Stephenson, Sec.-Treasurer. Committee of Management—Messrs. McHenry, M.A., Dowler, Ash, Robertson, and Scarlett, I. P. S. In accordance with a notice of motion given by Mr. J. W. Black at the previous meeting in Brighton, it was resolved:—That any person convicted of supplanting another teacher, or of aiding, abetting or in any way countenancing the same, shall be declared ineligible for membership in this association. Mr. Geo. Kirk, H. M., Model School, Cobourg, gave notice of motion for the reconsideration at the next convention of the resolution passed at the last meeting of the association, recommending the authorization and adoption of Gage's new series of Readers. "Mood" in English Grammar was ably treated by Mr. D. C. McHenry, M.A., Principal of Collegiate Institute, Cobourg. As Mr. McHenry is a gentleman of advanced ideas and high literary attainments, his rendering of this subject was listened to with deep interest. He was requested to allow his address to be published. One of the interesting features of the programme was a discussion on the "Relation of Trustees to the Progress of Schools," introduced by Mr. Andrew Black, chairman of the Cobourg High School Board. The speaker believed that financial embarrassment was a serious injury to the prosperity of any school. Teachers should be well paid, paid promptly, and as he thought in quarterly instalments. It was impossible for teachers to take kindly to their duties while paid grudgingly, or while suffering pecuniary embarrassment occasioned by a tardy settlement of their salary. Mr. C. C. Field, chairman of the Cobourg P. S. Board, supported Mr. Black's views and thought that the visiting of schools was an important duty of trustees. They should secure the best teachers available for the work required, pay them well, and *retain* them. Frequent change of teachers is extremely injurious to the prosperity of a school. The proceedings closed with an eloquent address on "The Teacher's True Aim," by the Rev. Hugh Pedley, B.A., of Cobourg.

CONTEMPORARY LITERATURE.

LATIN PROSE.*

We are indebted to the Messrs. Rivington, the well-known publishers of London, England, for a number of works relating chiefly to Latin Prose, and we propose, as far as the crowded state of our columns permits, to offer some remarks, by way of introducing these books to such of our readers as are not already acquainted with them. We naturally turn first to:

1. Bradley's Edition of a work in very general use in some shape or other throughout Great Britain and the United States, and long the Authorized Text Book in this Province—"Arnold's Practical Introduction to Latin Prose Composition." We may say at once that those who fear to see the ancient Arnold "improved," by means of footnotes upon trifles, inserted wherever possible, laborious references to some Grammar held in copyright by the same publisher, the exercises elongated, curtailed, or otherwise mutilated, to show that "the Editor" has been there,

or padded out with clumsy and irrelevant filchings from other men's books, will be agreeably disappointed. Dr. Bradley is a master of his subject, and in his work the reader will look in vain for traces of the "'prentice han'." He has recast the old work and added much new and recondite matter. The new work is Arnold's only in name.

Dr. Bradley may speak for himself. He says in the Preface:—

"An introduction has been prefixed containing three parts, two of which are new, the other much modified. The first of these is an explanation of the traditional terms by which we designate the different 'parts of speech' in English or Latin. The exposition is confined to the most simple and elementary points. This is followed by a few pages on the Analysis of the Simple and Compound Sentence. Such logical analysis of the language is by this time generally accepted as the only basis of intelligent grammatical teaching, whether of our own or of any other language. I have followed Mr. Arnold's example in prefixing some remarks, retaining so far as possible his own language, on the Order of Words; I have added some also on the arrangement of clauses in the Latin Sentence. The matter for translation as comprised in the various exercises has been almost entirely rewritten. I have not, after full consideration, taken what would have been the easier course, and substituted single continuous passages from a number of separate and unconnected sentences. I found that for the special purpose of the present work, dealing as it does with such manifold and various forms of expression, the employment of these latter was indispensable, and I have by long experience convinced myself of their value in teaching or studying the various turns and forms of a language which differs in such innumerable points from our own as classical Latin."

Dr. Bradley in honestly carrying out this programme has not spared himself, and the result is a work of more than ordinary merit. It is not always easy to speak accurately of

1. "A Practical Introduction to Latin Prose Composition," by Thomas Kerchever Arnold, M.A. New Edition, edited and revised by George Granville Bradley, M.A., Master of University College, Oxford: Rivingtons, London, 1881.

2. "Materials and Models for Latin Prose Composition," by J. Y. Sargent, M.A., Fellow and Tutor of Magdalen College, Oxford, and T. F. Dallin, M.A., Tutor, late Fellow of Queen's College, Oxford. Second Edition, Re-arranged with Fresh Pieces and Additional References: Rivingtons, 1875.

3. "First Latin Writer, with Accidence, Syntax Rules, and Vocabularies," by George L. Bennett, M.A., Head Master of the High School, Plymouth. New Edition: Rivingtons, 1881.

4. "Second Latin Writer, containing Hints on Writing Latin Prose, with Graduated Continuous Exercises," by Geo. L. Bennett, *ut supra*. Second Edition: Rivingtons, 1881.

5. "Exercises on the Elementary Principles of Latin Prose Composition, with Examination Papers on the Elementary Facts of Latin Accidence and Syntax," by J. Hamblin Smith, of Gonville and Caius College, and late Lecturer in Classics at St. Peter's College, Cambridge. Rivingtons, 1878.

6. "Latin Prose Exercises for Beginners and Junior Forms of Schools," by R. Prowde Smith, M.A., Assistant Master at Cheltenham College. Third Edition: Rivingtons, 1875.

the adaptability of a school-book to actual school-room use; but whatever in practice may be found to be the faults of this edition, it has been pretty generally conceded that the use of "The Practical Introduction" had revealed so many errors inherent in its method that a change was absolutely imperative, if scientific handling of the subject was not to be ignored. Arnold seems in the preparation of his work to have proceeded upon the assumption that English differs from Latin only in its phraseology, that Latin Syntax is English Syntax, and that very often a Latin word is an English word. He had no knowledge of the correct analysis of an English sentence, and no thorough grasp of the meaning of several important English idioms. Nor in this is he blameworthy, since it is only in our own day that English has been studied as English and shown to have a grammar and syntax of its own. In the matter of English speech and syntax the new edition is up to the times. In it a boy is not set to translate piebald English into piebald Latin. Moreover, if we are not mistaken, he will be goaded into something very like thought to render the new exercises into good Latin. Dr. Bradley has very cleverly frustrated all attempts at linguistic mimicry. He goes upon the maxim of the veteran teacher that, as a general rule, boys do not know the exact meaning of the words they use, and that for the most part they require close thought in rendering good English into good Latin. The happy rendering of Latin words and phrases into elegant English is not one of the least striking features of the work, and will be of special service to the English master.

It would be an inviting task to go through the chapters in detail, but this is unnecessary. The work will not lack readers, and will soon find its way into the hands of classical masters throughout the country. We fear it is a little too difficult for juniors, and that it will try the mettle of the majority of our boys; but under the new regime at Toronto University, Latin Prose is looking up, and with larger requirements it will re-

ceive more attention. Would that it could be called an easy book to our boys!

2. "Materials and Models for Latin Prose Composition," designed for the use of candidates for Classical Scholarships, Honors and Prizes at Oxford and Cambridge, reached a second edition some years ago. The views of the learned authors are crystallized in the following sentence: "He who wishes to write Latin must above all things, read Latin." Accordingly they have divided composition into six classes: 1, Historical; 2, Characters; 3, Oratorical; 4, Philosophical; 5, Epistolary; 6, Miscellaneous, all with minute subdivisions, and constructed a Table of Reference to Latin authors, so full that the student in writing any well-chosen selection may select from a list a set of typical passages that may put him in complete possession of the form and style of the author he wishes to imitate. The plan and execution of the work are admirable, but it is well to repeat that the bow of Ulysses is not for beardless youth.

After "Bradley's Arnold" might come "The Materials and Models" mentioned above. If the interval be too long and the beard be not grown, good practice may be obtained in "Bennett's First (3) and Second (4) Latin Writer," especially the latter, which contains three hundred continuous exercises of not less than fifteen lines each. Indeed, in the "First Latin Writer" there are among the 270 exercises not a few quite as difficult as the Krilof's Fables, recently set for matriculation at Toronto University. These little books furnish just the proper material for special exercises in our High Schools, and would form good pendants to the new "Arnold."

5. Mr. J. Hamblin Smith's little work is a good drill book on Forms, Constructions, and Differences of Idiom. He has also one hundred exercises of Continuous Prose, chiefly translations from Latin authors. Mr. Smith is certainly astray in advising pupils always to have at hand a Latin-English Dictionary to consult in case of need. A Latin-English Dictionary always in use will most surely destroy facility and accuracy in Latin composition.

6. Mr. Prowde Smith's "Latin Prose Exercises" is a much better book. It contains some valuable hints on teaching Composition, and recognizes the uselessness in trying to teach Latin to those that cannot or will not understand English. Prevention of errors is especially aimed at. The work is an attempt to drill boys in both Latin and English simultaneously, and this reasonable scheme has met with emphatic approval. It is a good book for the young teacher.

EDITORIAL NOTES.

THE "SCHOOL JOURNAL" AND
MILLAR'S "MARMION."

THE educational periodical world would seem either to be lying in wickedness or the proprietors of the *School Journal* must be specially suffering at present from a relaxation of mental and moral fibre. In the last number of our contemporary the extraordinary statement is made that we are the authors of, or that we instigated, the slashing review on the "Millar Marmion," published by Messrs. Gage & Co., which appeared in the columns of the *Toronto World* for the 28th of September, and that our motive in resorting to that journal as a vehicle of criticism was one of fear. What paralysis of fear does the *School Journal* think we are suffering from? In regard to the "Practical Speller" the journal accused us of cowardice, in being "willing to wound but afraid to strike;" now we are told that "afraid to venture on a criticism on Mr. Millar's high school edition of "*Marmion*" in the MONTHLY, we "have taken refuge in the columns of one of the daily papers of the city." Has our contemporary parted company with its wits, or do its owners aspire to momentary notoriety in a Police Court? Need we say that no one connected with this journal had ought to do with the review in question, or knew anything of the criticism until after it appeared; neither were we privy to its being sent to high school masters, as alleged, nor did we counsel or countenance its dissemination! We make this affirmation, not for the purpose of assuring our contemporary that it is altogether astray in its charge against us, nor to convince it of the folly of measuring us with its own measure, but to call the attention of its publishers to the fact that there are critics in journalism besides ourselves to whom

botch book-making is an unpardonable offence, and who are as free as they are competent to appraise Messrs. Gage's work at its true value. No doubt this is an unpalatable truth to our Wellington Street friends; but it is assuring to those who desire to respect the educational literature of the country.

But the publishers of "Millar's *Marmion*," in fastening upon us the authorship of what they are pleased to call a reckless criticism, needn't suppose that any one mistakes the motive which prompts the indignant outburst. Ashamed of the manner in which the book has been turned out in their hands they wish to divert public attention from the subject of the criticism to its supposed author. This is a ruse they have not now for the first time resorted to; but neither the profession nor the public are likely to be deceived by it. If Mr. Millar is wise, he will also refuse to be duped by the trick. He may, at the same time, dismiss from his mind the idea that any critic has personal ends to serve in denouncing the manner in which Messrs. Gage have produced his book. The abounding typographical errors in the work, and the evident recklessness with which it has been hustled through the press, would justify a more denunciatory criticism than has been passed upon it. But the mechanical blemishes in the work the publishers, in the main, are responsible for; and a knowledge of the fact restrained us from reproducing the review in our columns. What we have gained by our good-natured reticence, we have seen, and the vice of careless and malicious assertion was never more manifest.

As we are not reviewing Mr. Millar's work, we are not called upon to give its publishers the benefit of our criticism. The work having been offensively thrust under our nose, however, we are bound to protest

against the commercial dishonour to literature, in putting under the covers of one book material so utterly incongruous as a political pamphlet of Burke and a poetical creation of Scott. For this expression of book-making taste, as well as for other gifts in publishing, we presumedly have to thank Messrs. Gage. Success in trade, it has been affirmed, rarely exerts a favourable influence on dignity of character: it has to be added that, in the publishing field, it sometimes fails to exalt the sense of literary propriety. But success has spoilt more, and shall we say better? men than publishers; it is to be feared that in Canada it is extending its deteriorating influence to those who, under wholesomer conditions, might creditably pose as authors. The recent craze for native editions of English classics, and the facilities given for their introduction and use in the schools of the Province, have much to answer for. Many of these Canadian texts (and we are not specially referring to Mr. Millar's work) do industry credit at the expense of honesty. In not a few instances, everything is put under tribute but their editor's brains. They are compilations, the sources of which are seldom acknowledged, and the piecing together is sometimes fearful and wonderful work. It would, of course, be unfair to expect much from men who have served no apprenticeship to letters, who have had limited education or possess little originality of mind, and who have indifferent libraries to assist them in their labour. For these and other drawbacks we are most ready to make all allowance. But when the literature of a country is shaping itself, and when education is unduly forcing the mental activities, it is well to be jealous of any attempt to foist poor or watered work upon the community, and to see to it that those who take to authorcraft have aptitude for their task and will not leave their conscience behind in undertaking it. The apportioning to this man and the other of work which is to find its sole remuneration in the schools, is, we know, a legacy from the bureaucratic era of the Education Department. But the school-book literature of

to-day should be emancipated from the favour of officialism. Text-books that have the aid of successful wirepulling to disseminate them stand the more in need of examination and criticism. The duty is still more imperative when publishers vaunt their success to conceal their defects.

"WILLING TO WOUND, BUT
AFRAID TO STRIKE."

"ONE reason" we are told "for the success of Satan in the dominion of this world is the absolute intellectual singleness of his purpose." He wastes no force in hesitating; he has no compunction; and he never suffers

* "GAGE'S PRACTICAL SPELLER.—Correct typography (syllabication doesn't matter) is of the greatest importance in school books, and it is more necessary in the speller than in any other (speller) except the dictionary. It has been the earnest desire of the publishers of the "Practical Speller" (since the publication of the CANADA EDUCATIONAL MONTHLY'S critique on the work in the number for last December) to make it absolutely free from errors, and in this they (fondly but foolishly) believe they have succeeded. The proof sheets have been subjected to the most thorough revision (N. B. Subsequent to the appearance of the MONTHLY'S review!) by different persons, one of them a skilled proof reader (but not 'up' in syllabication) who has worked on (note this elegant phrase!) both Worcester's and Webster's dictionaries. With a view to the detection of defects (observe the alliteration!) in the latest edition, if such there be, (oh, surely not after the labours of the skilled proof reader!) they (i.e. the 'different persons' who have been revising the work) offer a reward of one dollar for each word found to be incorrectly spelt (how much for each word *wrongly syllabicated*!) the reward to go to the first person (one is always the second, of course!) who calls attention to any particular error (error by what standard in lexicography?)

"The best answer to the attempt of the literary 'smellfungus' of the EDUCATIONAL MONTHLY (This complimentary phrase is applied to us in lieu of a cheque for \$100 for our services in pointing out the huge mass of errors in the 1st and 2nd editions of the work) to prejudice the book is the fact that though it is only a year and a half since its first publication, the sixth edition is now on the press. (Query, who has seen the fourth edition?—that ordinal number seems not to be known to the publishers.—a jump was made from the 3rd to the 5th edition.) The last edition was one of 5,000 copies (where did they find a market?)—the book is not authorized for use in the schools of Ontario!), and these have been all disposed of (gratis) within three months. No book ever issued from the Canadian press has met with more signal (dis-) approval from teachers than this (—this? the *School Journal*!). We refer to these matters, not for the purpose of advertising a book that needs no special notice (because unworthy of it!), but to defeat the sinister purpose (we write with our right hand) of a hireling scribbler (it is not true!) We do our own writing, and have no hired amanuensis!), whose remarks of last month show that he is willing to wound (his own sensitiveness) but (not) afraid to strike (deceit)."—From Editorial (with illustrative comments of our own) in the "*School Journal*" for November.

himself to be placated. When he sees his mark, he hits it. With this interesting personage, the proprietor of the *School Journal*, in his last issue, seems to think that we can have no kinship, for in our criticism upon the "Practical Speller," which we are asked to believe is now of saintly typographical perfection, its angry publisher is of the opinion that though we may still be "willing to wound," we are, however, "afraid to strike." Well, from those who love us we are constrained at times to accept a compliment, for, coming from such a source, a compliment it is. Translated, it means that we are not so black as we have been painted. But is Mr. Gage serious in representing us in lighter colours than has been his wont? Is he of the opinion that we have really held our hand of late, or has not his own "hireling scribbler" got matters mixed? Should he not have written: "unwilling to wound, but not afraid [nor unable] to strike?" Our own impression at any rate is that *we had struck!* But we will not dispute the point, though our issue of last December tells its own tale.

We are glad, however, to learn from the accompanying *School Journal* editorial that the publishers of the "Practical Speller" have at last realized the importance of "correct typography" in school-book literature. Their "earnest desire" to improve the orthography of their publications will be a gain, we hope, to the education of the Province, for which our school authorities and Messrs. Gage will have to thank the MONTHLY and the literary "smellfungi" on its staff. The debt owed to us by the publishers of the "Speller" might first have been liquidated, however, before issuing their ostentatious "promise to pay" other people for work we had already done. Ninety per centum of the errors we pointed out in the "Speller" have been corrected in later editions; and considering that the publishers will have no personal service to win in furthering the sale of the book by settling that little bill with us, we are willing to accept settlement at half the reward now offered for the discovery of the errors yet to be corrected in the work. This advantageous adjustment of our claim

we shall expect the firm at once to accept. If, however, *they are willing to wound but unwilling to pay*, we will defeat their "sinister purpose" by withholding information of the errors in syllabication which still disgrace the book and besoul the nostrils of the "literary 'Smellfungus' of the EDUCATIONAL MONTHLY."

To the Editor of the C. E. Monthly.

SIR,—Will you kindly aid us in settling a dispute? At our last Convention the subject of pronunciation was discussed in connection with the reading of a paper on that subject. It was hotly contended by many that in words like *vaunt*, *taunt*, *gauntlet*, and *laundry*, the *au* should have the sound of *a* in *far*, whilst others, with equal force, fought for the broad sound of these letters, like *a* in *fall*. Which way is it? An early reply will oblige

Yours, etc.,

November 22nd.

PEN. E. TANG.

[Usage is divided. The weight of dictionary authority is in favour of the *a* in *far* sound, but most good speakers pronounce words such as the above with the broad sound of *a* in *fall*. *Vaunt* and *vault* always have this sound.—*Ed. C. E. M.*]

TO OUR SUBSCRIBERS.—Owing to pressure of work at the printers, in anticipation of the early meeting of the Ontario Legislature, the present number of the MONTHLY has been unduly delayed. Many contributions have for another reason—from want of space—been crowded out. In the December issue, which will appear at the close of the year, we hope to overtake much of this matter. The number will contain a paper by the Editor, reviewing the recent progress of Canadian literature. Editorials will also appear on Education in Quebec; Our School Legislation; A Plurality of Authorized School Readers; together with extracts from the *Bystander* on Educational Questions, and a communication on the New Public School Programme. Arrangements are nearly completed for the new year. Many interesting papers and not a few new features will be introduced in 1883. The MONTHLY will enter upon its fifth year with increased vigour and, thanks to its many and hearty friends, with a greatly extended subscription list.