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THE CANADA
EDUCATIONAL MONTHLY
AND SCHOOL MAGAZINE.

SEPTEMBER, 1885.

EDUCATION OF TEACHERS.

BY PROFESSOR M. MACVICAR, PH.D., LL.D.

WHAT is the teacher's work? What qualifications must he possess to do his work efficiently? Are these qualifications natural or acquired? If acquired, how can they be best acquired? An answer to each of these questions in their order may assist in throwing light upon the more general question, How should the education of teachers be conducted?

The question, What is the teacher's work? may be variously answered, according to the stand-point from which it is viewed. The relation of teacher and pupil is complex, hence, not unfrequently, one or two of the elements of this complex relation is magnified into the whole. For example, many regard the teacher as simply an instructor, or the medium through which knowledge is imparted to the pupil. The teacher is, in a certain sense, an instructor. It is certainly one element of his work to impart knowledge, but it is only one, and perhaps the least important element of the whole. To judge cor-

rectly of this complex relation, and to determine the relative importance of all its elements, and hence the true nature of the teacher's work, we must view the subject carefully from the pupil's side as well as the teacher's.

The limits of a few short articles in *THE MONTHLY* will not permit any proper analysis of the pupil's nature, or of the transformation which takes place in that nature as it gradually unfolds in passing from infancy to manhood. Assuming, however, such an analysis, it may be safely affirmed, that in developing a symmetrical manhood, the pupil must acquire four things, namely, power, habits, tastes and knowledge. These four things, together, constitute the fundamental elements of a real education. They rank in importance, as factors of such an education, in the order in which they are named. The teacher's work centres upon these, hence it is necessary to note carefully their nature and relations to each other.

And first, the acquisition of power has reference to every part of our

nature. The development of physical power, in a general sense, running parallel with the growth of the body, and of intellectual, moral and spiritual power, running parallel with the growth of the mind, will be conceded by all. But more than this must be conceded. Man, although an exceedingly complex being, composed of body and mind, is an organized unit. As such, every organ and faculty of which he is composed is endowed with the possibility of acquiring a power peculiar to itself. For example, the eye acquires the power of discriminating colours, the ear, of sounds, the memory, of retaining knowledge, and the will of putting forth energy. It is with this possibility, inherent in every organ of the body and faculty of the mind, the teacher has to do. To develop these special powers in his pupils should be the chief purpose or end of the teacher's work. If he fails in this he fails in doing the most important part of his work. Power is the foundation on which every other acquirement must rest. By this, however, is not meant power in general, but individualized power—that which can be discriminated and localized as belonging to special organs or faculties. It is true, that in the economy of body and mind there is a blending of power which produces what may be called strength or general power. Such power, however, is simply the result of aggregating the special power inherent in the individual organs of the body and faculties of the mind. The teacher's work has reference to this strength or general power, but only indirectly, only so far as he controls the symmetrical development of special powers. The blending or result is entirely independent of anything he can do. His efforts must always be specialized. His work must, in every instance, be directed to definable ends. He can-

not perform generic work; work which is equally effective in developing the power peculiar to every organ of the body and faculty of the mind. In this statement, however, it is not affirmed that the teacher cannot arrange his work so as to accomplish two or more ends at the same time. This he does, and must do, if he is an efficient teacher, but he does so consciously. He is not firing arrows at random at an indefinable object. He knows every step he takes in his work, just what end or ends he seeks to attain. Hence, his efforts, as already stated, are in the strictest sense specialized.

In dismissing for the present the question of the acquisition of power, we must observe that we have not discussed the way in which this acquisition is made. This we may do hereafter. We have sought only, very briefly, to emphasize the fact that this acquisition is possible, is co-extensive with our entire being, is the foundation of every other acquisition, and that it stands first in the order of the teacher's work. To this we may add that the teacher's work cannot be efficiently performed unless every step of it is arranged and executed with reference to the systematic and symmetrical development of specialized power. This is the teacher's first duty, his second has reference to the development of habits.

We have said that power is the foundation of every other acquirement. This we hold as a fundamental educational principle. But we hold it in the sense of distributed power, inherent in the organs of the body and faculties of the mind. Without this distributed power animal organisms would serve no higher purpose than a finely-finished machine formed of inert matter. With this, however, animal organisms, united with mind, become a living unit possessed of almost infinite possibili-

ties. The most perfect machine that can ever be made of inert matter can only serve as a medium through which power may be transmitted from one point to another, and applied in one given way in performing work. How infinitely superior to this is the human body! It not only transmits and applies, but it acquires and conserves power, just at the very points where work is to be done. But this is not all. An unlimited possibility of acquiring and conserving power, with a limited possibility of transmitting and applying it in performing work, would be of comparatively little value. Man is not thus constituted. When rightly understood it will be found that the possibilities in his body and mind of applying power are in every way co-extensive with the possibilities of acquiring and conserving it. But let us note these possibilities carefully in their relations to each other, that we may discover still further the nature of the teacher's work.

The medium through which power, whether physical or mental, is properly utilized in the performance of work is habit. The truth of this statement may be readily shown by reference to any sort of mechanical skill. Take, for example, the hand; it is endowed naturally with the power of producing an almost infinite variety of motions. It is also subject in a certain sense to the direction of the mind. Does this fit it to handle successfully tools of any sort? All will answer emphatically, No. Practice is needed in order to do this. But what is meant by this practice? Simply this, that a persistent and continuous repetition, through an effort of the intelligence and will, of the motions of the hand, necessary to do a given kind of work by the use of certain tools, induces a state of the organism concerned in producing these motions which we call habit. Just here it is very important, in order

to locate rightly the teacher's work, that we note with some care the nature and use of these induced states or habits.

In the above example the motions of the hand in using the tools are at first produced, very imperfectly and slowly, by the exercise of a strong effort of intelligence and will. By persisting, however, in the practice, dexterity is gradually acquired, and the necessary effort of the intelligence and will gradually diminishes, until finally the work is performed with rapidity and ease, without almost any conscious effort. The formation of all habits, whether of body or mind, follows substantially the law here illustrated. It will therefore be observed, that as rapidly as habits are perfectly formed, conserved physical and mental power can be applied, almost, if not altogether, unconsciously, in the performance of work. In this case, the exercise of the intelligence and will ceases to be necessary to direct and control the muscular and nerve energy or mental energy by which the work is performed.

When this point is reached workmanship of a high order becomes possible. But why is this? The answer is plain. The mental energy, that was before required to handle and direct the tools, is now used in studying and perfecting the ideal as the work progresses; hence the improved results. Universal experience verifies this position. A first-class mechanic is, in every instance, a man who has converted the use of each tool that he handles into a perfect habit, and hence who is able, while doing a piece of work, to give his whole attention to shaping everything with reference to the finish and perfection of the work itself.

But what is true of mechanical effort holds equally true of all departments of art. Finger and foot movements, for example, in piano and

organ music, must become habits or unconscious acts before the player can produce any effects of a high order. To produce such effects the intelligence and will must be perfectly free and directed to the ideal which the artist seeks to make real in his own mind, and in the mind of his hearers. Painters, sculptors, orators and artists of every sort are equally as dependent as the musician upon the adaptation and perfection of the habits formed. They can never produce a high order of results, until, by the formation of habits, the power of the intelligence and will is left entirely free to be used in studying and shaping effects, rather than in directing and guiding purely mechanical movements.

But again, habits are no more necessary as conditions of efficient work where the body plays so important a part, than they are where mind alone is concerned. A single example will illustrate this. The power of continued attention is a *habit* or induced state of the mind. In the case of very young children this power scarcely exists. This is also true to a large extent of persons of mature years. In the first attempt at real study it requires a struggle and a strong effort of the will to hold the mind continuously upon one point. This fact is clear in every person's experience. But there is another fact equally clear, namely, that the persistent and continuous effort of the will in holding the attention induces

a state of mind in which the exercise of this will-power becomes gradually less and less necessary. Indeed, as in the case of the use of tools, so in this, the point may be reached where the conscious exercise of the will is only necessary to initiate the act of attention. This is exactly the condition of persons, who, when their attention is turned to a subject, become entirely unconscious of their surroundings, and of everything but the matter under consideration.

From the foregoing suggestions on the nature and use of habits, it will be readily seen that they constitute a very important factor in a symmetrical education. Power without habits is of comparatively little value. Habits constitute the only medium through which power can be properly utilized in performing work. Hence the formation of habits, of body and of mind, should receive the earnest attention of the teacher. We do not undervalue knowledge as one of the principal factors of an education when we say that its acquisition is of much less importance in the development of a vigorous and symmetrical manhood than the acquisition of power and habits. Yet, if we judge correctly of the course pursued with their pupils by many teachers and college professors, the acquisition of knowledge is the chief if not the only end for which they work. But more of this when we have considered the acquisition of tastes and knowledge.

(To be continued.)

THE following statement will suggest some idea of the vast amount of literary labour which has been employed in the making of books, and of the comparative size of public libraries: Germany has more books in its libraries than any other nation. There are over 1,000 libraries in Austria, Germany and Switzerland, twenty of which contain over 100,000 volumes. France has six libraries of over 100,000 books, besides the National Library, which is the largest in the world.

Great Britain has only nine libraries of over 100,000 volumes, and the British Museum pays out \$10,000 annually adding to its collections. Spain has thirty public libraries containing altogether 700,000 volumes. The library in Washington contains 518,000 volumes and 170,000 pamphlets, and there are but five larger in the world—the French National, with 2,500,000; the British Museum, 1,500,000; St. Petersburg, 1,000,000; Munich, 900,000, and Berlin, with 750,000.

PERMANENCY OF THE TEACHING PROFESSION.

BY DAVID FOTHERINGHAM.

THE subject of this paper is more important than attractive. Its right treatment demands more time and space—not to say, ability—than at my disposal. I shall hope, however, to enlist your sympathy and develop profitable discussion.

Where thoroughly qualified persons are employed continuously in any calling, the results should be more satisfactory to themselves and to their employers. On all hands it is admitted that better work and better returns are secured when skilled workmen perform the same duties in the same office year after year. Change of office or officer of necessity implies initiation into the peculiarities and specialties of the new office or officer, with corresponding loss of time, efficiency and progress. Change, of necessity, implies a period of disquietude and friction, of anxiety, if not mortification, to employer and employed; and these disadvantages are intensified as the nature of the work involves more of the intellectual and moral, and less of the merely mechanical.

It is not risking much to affirm that in no occupation are the evil effects of change more likely to be serious than in teaching. The material with which the teacher has to deal is the most precious and enduring of which the earth has knowledge, and its essential nature is so delicate and full of far-reaching possibilities, that to transfer its management from hand to hand, year by year, in its plastic condition, makes it certain that great loss must follow. A plant cannot

thus be transferred from soil to soil and climate to climate without a serious dwarfing of its powers. Neither can the young mind, learning to observe, reason, act, to know and love truth and beauty and power, after the training and individuality of one teacher, in the atmosphere and soil of which he is the sun, be transferred to the hands of another without serious loss.

Even in a pecuniary aspect, frequent change involves no small loss. Under favourable circumstance, the new teacher cannot readjust the mental and administrative machinery of a school and have the whole moving on harmoniously from the point his predecessor left it at, in less than two months—not always so soon. It may be allowed that, in ordinary circumstances, three months are nearly lost to a school. When the change is a bad one, which too often is the case, a year and more, with all its outlay, is lost.

It is frequently affirmed and universally believed that, in Ontario, much is lost through lack of permanency in the profession to which we belong. To reach, as nearly as may be, the actual state of the case, I have grouped statistics bearing on this point as I could gather them from official returns. These cover thirteen years, beginning with 1871 and ending with 1883, the last that has been fully reported. If all the generalizations reached are not absolutely correct, they are at least approximately so.

In 1871, 5,036 teachers were employed in Ontario, and 2,236 certificates (including 390 interim) were issued by the Education Department

* Read before Teachers' Association of Ontario, August, 1885.

and County Boards. That is, forty-two new teachers for each hundred employed were licensed in 1871. In 1872, 2,560 (including 578 interim) certificates were granted. That was at the rate of forty-six to the hundred. In 1877, 2,269 (including 464 interim) certificates were sent out, making thirty-five new, to each hundred. In 1881, if I have been able to get the correct figures, only twenty to the hundred were granted. In 1883, thirty-four to the one hundred were given. During the thirteen years, the Department and the County Boards had issued 260 First Class, 3,985 Second Class, 16,570 Third Class, and 7,256 Interim or other Certificates—28,071 in all. To maintain an average staff of 6,257 teachers in active service for thirteen years, 28,000 certificates were issued, or an average of 2,159. Putting this in other words, the new issues, one year with another, were thirty-four per cent. of those in actual use.

This would not necessarily show that thirty-four per cent. of the teachers were raw recruits. The average issue of Class I. was twenty, of Class II. 306; of Class III. 1,274; and of Interim and other Special Certificates, 558. Now, all Class I. and II. teachers must have had employment before securing their certificates, while some "Thirds" were given a second time, on due examination; and a considerable number of "Specials" were no doubt "Extensions" of "Thirds."

We may therefore regard all I. and II. Class as renewals; that is an average of 326. To this add an equal number for renewals of "Thirds," and, say, one half of the "Specials," and we shall have a total of about 930 certificates issued yearly to persons who had had more or less experience. Deducting these from the average issue we have still left about twenty new and inexperienced teachers every year in one hundred—one out of five.

At this rate the profession is entirely changed in five years; and I am satisfied that this is within the mark.

A large proportion of Third Class Teachers do not remain in the profession till their certificates expire; and the expiration of "Extensions" and "Specials" not infrequently means the expiration of the holder's term of service.

The medical profession is largely replenished if not overstocked from ours.

Not a few in law and divinity get their first start in pocket, if not in ambition, in the teacher's calling, while a sprinkling of our legislators and other public men owe their knowledge of men and things to the impetus given them in their school-teaching days.

And the discovery in the public school of the gift to teach has no doubt led a large number of those now in high schools to devote themselves to the more remunerative and more permanent work of their advanced calling.

Thus, naturally, creditably, in this young country, our profession has given of its best talent to all the professions. No wonder that it changes so much. Yet it holds its own even though changed in *personnel* once in five years. More: we stand to-day in advance of our profession of twenty, ten, five, years ago. In literary attainment, in professional training and public opinion the teacher of to-day is in advance of himself yesterday; and while, hitherto, we have suffered heavily from lack of permanency in the profession we find, in this vantage ground, as well as in the rapid increase of Second Class teachers in the service, a sure promise of better things still in the future.

[NOTE.—In 1871, 517 Second Class teachers were employed. In 1883, 2,167, or four to one, were in active service.]

Some of the causes of the lack of permanency in the profession have been hinted at. I shall seek to place them more in detail :

Insufficient remuneration is undoubtedly a leading cause. Persons wishing to become teachers must spend from two to three years in non-professional and professional preparation, at a time when it would be possible for them to earn a fair livelihood in other pursuits. After all this time and considerable outlay of money they seldom secure \$300 as a salary at first. If successful, they may hope to get \$400 by the time their "Third" expires. Then comes another course for a "Second," after which they may look forward to the munificent sum of \$450 or so, though the highest average reached in counties for male teachers is less than \$400, and for female teachers, less than \$250.

With equal literary and professional training in other callings, teachers would, undoubtedly, have far superior prospects both as to permanency and pay; while, with an additional expenditure, not greater than that of the past, they often find employment in one of the learned professions where the prizes offered are both more numerous and more inviting. It is no matter of surprise, therefore, to find many of our clever and ambitious teachers making ours a stepping stone to some other life work.

Lack of fixity of tenure, if constant change of sphere may be so named, is another important factor in driving teachers out of the profession. Like travellers in a desert, they do little else than pitch tent and next remove it. One year here, another there, they begin to fear the mark of Cain is on them, and look around for a local habitation and a name—some abiding home and steady occupation. Akin to this comes—

The lack of professional recognition,

which no doubt has discouraged most of worthy teachers. A higher or holier calling than the teacher's can scarcely be found, and yet he has been and is slighted and slurred as if entitled to nothing but his bread and butter and not always to that. Undoubtedly, there are exceptions, and the profession is claiming and receiving more of its legitimate place through its own higher merit, and also through a more rational attitude on the part of the public. But stunted appreciation, or the very opposite, has had decided influence among the factors that make the profession so changeable.

Lack of adaptability in teachers has also had its influence in producing change, and that oftener than we are prepared to admit. Not a few have chosen the life of a teacher who have had neither natural nor acquired fitness for the successful discharge of its intricate and unending duties. When one enters the profession to have an easy life, never greater mistake was made. When one enters it without intuitive insight into or love of childhood, a greater mistake was never made. When one enters it who does not daily feel need of fresh inspiration and new resources, no greater mistake could be made. Yet these mistakes occur and recur with painful frequency; and every faithful inspector has had the painful duty of advising one and another to seek a different calling.

Defective administration of the school law has had much to do with change in our profession. This is often defective, feeble, fickle. School boards are unnecessarily numerous and mutable; often uneducated, sometimes biassed by local prejudices and jealousies; do not always recognize the efficient; often appreciate the cheap and superficial, and often neglect the simple essentials of efficiency in a school. With the official

rope in the hands of such an administration, not much wonder that high-minded teachers leave the profession.

Parental shortcoming has to do with the change of which I speak. How few parents recognize in a teacher their substitute, associate and equal! How few of them inculcate and require unquestioning obedience to their authority delegated to him! How few recognize practically their obligation to forward study at home as much as the teacher's at school! How many of them allow the children to decide the social and professional standing of the teacher, and treat him as their children indicate, without hearing "the other side"? How many of them take a practical and daily interest in school work and life so as to become co-workers with the teacher?

I must trespass further to speak a little of the results of lack of permanency. There is great loss every way. First and foremost, the loss to the child is simply incalculable. As matters now stand, the majority of teachers have not acquired a full measure of skill and tact and patience and unselfish devotion to their children which can only be gotten in the school of experience. Nor can we expect much improvement here till the profession becomes reasonably permanent. To many children, this means disaster—indelicat, sometimes rough, handling, and change of manipulation, sometimes ignorant, unappreciative, hardening, coarsening, distorting, change in manipulation. It cannot be otherwise while into so many schools every year introduces many youths of little knowledge of child nature and no experience in its control or development.

To the teacher, it means a dwarfing of ambition, a scattering of resources, a straining of local and social attachments, disappointment of hopes, a weakening of powers, a lessening of opportunities, a circumscribing of

usefulness. Not even an angel could do as good work with this sword of separation suspended eternally over his head. How can a teacher in these circumstances secure the highest results of a wise, logical and thorough course of education in a few months? How can he secure the best results of sympathy, co-operation and love—the cumulative power of moral and intellectual forces—in the time a teacher now holds his school? And so, hampered and discouraged, the most conscientious and earnest may be excused for leaving an occupation which keeps them as it were beating the air.

To boards of trustees, this lack of permanency largely means outlay without return, a school in name, not in reality. To the enlightened and liberal it brings disappointment and discouragement, so that when their term expires their services are withdrawn or reluctantly renewed.

To parents, it means half educated sons and daughters, with half cultivated tastes, poor literary habits, and a love of transitory and unsatisfying gratification; while the pure and lofty enjoyments of a cultivated soul are unknown and unappreciated. Nothing occurs oftener than to hear a father say: "My boys were just at the age when a year or two with a good teacher would have secured the education they need, but we had an unfortunate change of teachers and their chance was lost; I cannot spare them now."

To the country this changing means a lower average of intelligence, enterprise and power in private and public life. Nothing can advance so surely or so rapidly, for her citizens have left their talent buried in the earth. Her legislators have given to her untutored sons to control the destinies of the land by saying: "You shall employ to-day and dismiss to-morrow as you like, those who are set to un-

seal the springs of intellectual and moral life;" those who, more than any other, could develop in the citizen the principles of true patriotism, ambition, courage, self-sacrifice and love.

I can only speak briefly of the remedies for the lack of permanency in the profession. These must come chiefly from two sources, the profession itself and enlightened and practical legislation.

The more we truly and fully appreciate the dignity and responsibility of our calling, the more we understand the importance of our rare opportunities, the higher will we rise above petty ends and ways, the nearer will we get to the ideal of a teacher of the young. Day by day will we toil to acquire worthiness for our work and its reward, the love and admiration of our pupils and their parents, because we are their best benefactors. When these come permanency will soon follow.

Salaries should be largely increased, but how this can be done is a problem that few are able to solve. That salaries are improving is evident, the cause being found chiefly in the better appreciation of trained and experienced teachers. Even boards of trustees learn by their experience that training and experience are worth more than inexperience and cheapness. With this view before us, it would seem that the remedy of low salary is at least partly in the hands of the profession itself. Let teachers never rest satisfied till they are near the head of the profession in legal qualification and also in practical efficiency. If teachers remained for life in this calling, no doubt greater efficiency would be reached, and fewer inexperienced could enter to work for less, as they are really entitled to less. So that in reality permanency in the work and more remuneration would become mutually helpful. Loyalty to the pro-

fession should lead all who enter it to observe the golden rule towards each other. I hope it never occurs in a section or county represented here, but it has been charged that teachers sometimes so far forget their self-respect and the reputation of the profession as to underbid their rivals for a school. It thus happens that lack of self-respect and lack of professional honour have come in along unfortunately with a proportion of drones to keep down the reputation and the pay of the profession. These evils let us trust, as many feel sure, are lessening and will soon disappear. Meantime let us not claim that legal assistance is all we need to raise our pay till we have exhausted our resources in ridding the profession of those who have hitherto only lessened its efficiency, its reputation and its remuneration, and till we bring the highest attainable qualifications to our work.

On the other hand we have the right to expect that those who hold the power to legislate and administer, will look above and beyond the conflicting interests of the present to the unchanging principles that underlie the full development of social, intellectual and moral forces; that they make ample and far-seeing provision for the education of the young, including the untrammelled and uninterrupted discharge of the teacher's duties.

It should be within the sphere of legislation to make adequate and attainable provision for a teacher's residence in every well-to-do section. No one thing would help the cause of permanency more. *How* to provide this cannot be here discussed, but till this is done there cannot be true permanency. And why should the teaching profession alone be expected to live without homes? and on incomes so small and precarious that teachers cannot in reason be expected to provide homes for themselves?

Why cannot some provision be made in law by which a fair proportion of public grants shall go to the sections that provide residences for their teachers, and to the teacher who holds a life certificate and resides in that residence, from year to year? Thus, liberality on the part of trustees and higher qualification and permanency on the part of the teacher would be directly rewarded.

Provision should be made that will secure prompt and ample supply of appliances, both as to accommodation and apparatus for the efficient discharge of the teacher's duties. Many a teacher is worried and discouraged, sometimes to the extent of changing schools, because he cannot get needed supplies.

Provision should also be made for a teacher's assistance and self-improvement during his months and years of labour. Why should not every board of trustees be required to furnish a library containing a few of the best authors on professional work, some of the most useful books of reference, and at least one educational periodical? While such provision may be classed among the less important means of securing permanency, it and others have their place and should not be overlooked.

I crave your indulgence for the imperfect way in which I have presented this important subject, but the time and ability at my disposal have been my limitations, and I trust the hints given may lead to practical results.

THE NEW DEPARTURE IN COLLEGE EDUCATION.

CRITICISM OF IT BY JAMES M'COSH, D.D., LL.D., PRESIDENT OF PRINCETON COLLEGE, U.S.

(Continued from page 172.)

II.

Specialties in Study.—Men have special talents, and so they should have special studies provided for them. They are to have special vocations in life, and college youth should so far be prepared for them. Every student should have Obligatory studies, but he should also be allowed Elective studies. The branches of knowledge are now so numerous and literature is so wide and varied, that no one can master it all; should he try to do so, he would only be "a jack of all trades and a master of none."

The student should have two kinds of electives provided for him. He may be allowed to take subjects which could not be required of all, such for

example, as Sanscrit, Anglo-Saxon, the Semitic Tongues, and in science, Histology and Physical Geography. No college should make these obligatory, and yet considerable numbers of students would prize them much and get great benefit from them to fit them for their farther study and life-work. Or, the student, after taking certain elementary branches, should have higher forms of the same provided for him, and be encouraged to take them. Of all the rudimentary branches or cardinal studies, there should be a course or courses required of all in order to make them educated gentlemen, but there should be advanced courses—Electives, to produce high scholars in all branches, literary, linguistic, scientific, philo-

sophic. All students should know several of the highest languages, ancient and modern, but there should be advanced linguistic studies, and especially a science of Comparative Language. I defy you to make all master Quaternions, or Quantics, or Functions, but these should be in the college for a select few. All should be taught the fundamental laws of the human mind, but there should also be a number entering into the depths and climbing the heights of the Greek, the Scotch, and the German philosophies.

I hold that in a college with the variety there should be a unity. The circle of the sciences should have a wide circumference but also a fixed centre. In every year there should be certain primary and radical studies required of every student, with all the while a diversity in his electives. This I take the liberty of saying is the difference between Harvard and Princeton. In Harvard there are now in no year any studies obligatory on all except a part of Freshman year studies—everything is scattered like the star-dust out of which worlds are formed. Greek is not obligatory; Mathematics are not obligatory; Logic and Ethics are not obligatory. In Princeton a number of disciplinary branches are required, and so many are required in each year to give us a central sun with rotating planets. In Nature, as Herbert Spencer has shown, there is differentiation which scatters, but there is also concentration which holds things together. There should be the same in higher education. In a college there may be, there should be specialists, but not mere specialists, who are sure to be narrow, partial, malformed, one-sided, and are apt to become conceited, prejudiced and intolerant. The other day a gymnast showed me his upper arm with the muscle large and hard

as a mill-stone. It is a picture of the mental monstrosities produced by a certain kind of education. The tanner insists that "there is nothing like leather," and the *literateur*, that there is nothing like language; while the mathematician assures you that there is nothing to be believed except what can be demonstrated; leading Goethe to say, "As if, forsooth, things only exist when they can be mathematically demonstrated. It would be foolish in a man not to believe in his mistress's love because she could not prove it to him mathematically; she can mathematically prove her dowry but not her love."

Dr. Eliot tells us he has found great difficulties in combining the Prescribed and Elective Courses. In my thirty-two years' college teaching I have met with no such difficulty. On the contrary I have found them working in harmony. Thus I have found the Prescribed study in Greek helping me in the Elective History of Philosophy.

It is now shown that all science is correlated, and every one thing depends on every other. Humboldt had his "Cosmos," and Mr. Grove his "Correlation of the Forces," and the Duke of Argyll has his "Unity of Nature." Nature is a system like the solar, with a sun in the centre and planets and satellites all around, held together by a gravitating power which keeps each in its proper place, and all shining on each other. You cannot study any one part comprehensively without so far knowing the others. In like manner, all the parts of a good college curriculum should be connected in an organic whole. Make a man a mere specialist and the chance is he will not reach the highest eminence as a specialist. The youth most likely to make discoveries is one who has studied collateral subjects; the well gushes out at a certain point because the rains have de-

scended on a large surface and entered the earth, and must find an outlet.

I may here point out the evils little noticed arising from a boy having too many choices; they say two hundred in Harvard. I believe that comparatively few young men know what their powers are when they enter college. Many do not yet know what their undeveloped faculties are; quite as many imagine that they have talents which they do not possess. Fatal mistakes may arise from a youth of sixteen or eighteen committing himself to a narrow-gauge line of study, and finds when it is too late that he should have taken a broader road.

A young man, we may suppose, when he enters college leaves out Greek, attracted by a popular teacher of French. When he has done so he finds, as he comes to Junior year, that a voice, as it were, from God, calls him to preach the gospel of salvation. Then he comes to see his mistake, for if he has to be an expounder of Scripture, he must know the language of the New Testament, and to attain this he must go back two or three years to school, and, unwilling to do this, he gives up studying for the ministry. The Churches of Christ will do well to look to this new departure, for they may find that they have fewer candidates for the office of the ministry. The Colleges may have to look to this, for the churches furnish to them the most constant supply of students. For myself, I fear that the issue will be an unfortunate division of colleges into Christian and infidel.

A like result may follow from other unfortunate choices, as we say, from young men "mistaking their trade." One who might have turned out a splendid teacher devotes himself to metaphysics and neglects classics and mathematics. Another who might have become a statesman has avoided logic and political economy, being

allured by music and plays. The boy has turned away from mathematics to find that in his future study and professional work he absolutely needs them.

III.

Self-Government.—I hold that in a college, as in a country, there should be government; there should be care over the students, with inducements to good conduct, and temptations removed, and restraints on vice. There should be moral teaching; I believe also religious teaching—the rights of conscience being always carefully preserved. But one part of this instruction should be to inculcate independence, independence in thinking, independence in action and self-control. The student should be taught to think for himself, to act for himself. If he does not acquire this spirit, no external authority will be able to guide and restrain him. I abhor the plan of secretly watching students, of peeping through windows at night, and listening through keyholes. Under the *spy* system, the students will always beat their tutors. The tricky fellows will escape, while only the simple will be caught.

But is there, therefore, to be no moral teaching, no restraint on conduct? Are students to be allured away from their homes, hundreds and thousands of miles away, from California, Oregon, and Florida, to our Eastern colleges, and there do as they please—to spend their evenings according to their inclinations, to keep no Sabbaths, and all the while get no advice, no warning from the college authorities? They see a student going into a liquor store, a dancing saloon, a low theatre, a gambling-house. Are they to do nothing? Are they precluded from doing anything? A student is seen drunk. What are you to do with him? "The law is not made for the righteous man, but for

the lawless and disobedient." Have you no law to reach him? You have no right to discipline him. It is an interference with his freedom. He is a man, and not a boy, and he should resent it. He is able to guide himself. His widowed mother lives a thousand miles away, and cannot reach him. He continues in this course. Are you to allow him to remain in the institution to ruin himself and corrupt others? You answer, we will send him away. But you cannot do so (so I hope) without evidence, and this implies that horrid thing, discipline. But you dismiss him. I have been obliged to dismiss students on rare occasions. It is a terrible ordeal to me. I have sometimes felt more than the student himself. And when the father comes to me, the father trying to suppress the bursting feeling, and the mother in agony which cannot be restrained, I am crushed, I am prostrated. But my creed is, prevention is better than punishment. Surely, if we have the right to dismiss and expel (I never expelled a student), we have the liberty to instruct, to advise, to remonstrate, nay, to discipline. I have some painful scenes to pass through in the government of a college, but I have had more pleasant ones. I have to testify that three-fourths, I believe nine-tenths, of the cases of discipline I have administered have ended in the reformation of the offender. I have been gratified by many fathers and mothers thanking me for saving their sons from ruin. Scores of graduates, when they meet me, have said, "I thank you for that sharp rebuke you gave me; you gave it heartily, and I was irritated at the time, but now I thank you as heartily, for I was arrested thereby when rushing into folly."

It is time that fathers and mothers should know what it is proposed to do with their sons at college. The college authorities are in no way to interfere

with them. They are to teach them Music and Art, and French Plays and Novels, but there is no course in the Scriptures—in their poetry, their morality, their spirituality. The President of Harvard recommends that all colleges should be in great cities. Students are to be placed in the midst of saloons, and gambling-houses, and temples of Venus, but meanwhile no officer of the college is to preach to them, to deal with them. Suppose that under temptation the son falls. I can conceive a father saying to the head of the institution, "I sent my son to you believing that man is made in the image of God, you taught him that he is an upper brute, and he has certainly become so; I sent him to you pure, and last night he was carried to my door drunk. Curse ye this college; 'curse ye bitterly,' for you took no pains to allure him to good, to admonish, to pray for him." I was once addressed by a mother in very nearly these words. I was able to show that her son had come to us a polluted boy from an ungodly school, and that we had dealt with him kindly, warned him solemnly, disciplined him, given notice of his conduct to his mother, and prayed for him. Had I not been able to say this conscientiously I believe I would that day have given in my resignation of the office I hold, and retired to a wilderness to take charge of myself, feeling that I was not competent to take care of others.

It is a serious matter what we are to do to provide religious studies in our colleges. Professor Huxley knows that there is little or nothing in our ordinary school books to mould and form the character of children, and so, as member of the London School Board, he votes for the reading of the Scriptures in the schools, not that he believes them, but because they are fitted to sway the mind,—which I remark they are able to do, because

they are divine. Everybody knows that science alone is not fit to form or guard morality; and Herbert Spencer is very anxious about this transition period, when the old has passed away (so he thinks) and the new morality is not yet published. Emerson stood up manfully for the retention of prayers in Harvard University. Are we now in our colleges to give up preaching? to give up Bible instruction? to give up prayers? But I am on the borders of the religious question, on which I now formally propose that *This club should have another meeting, in which President Eliot will defend the new departure in the religion of colleges, and I engage with God's help to meet him.**

In closing, I have to confess that I regard this new departure with deep anxiety. The scholarship of America is not yet equal to that of Germany or Great Britain. Some of us are anxious to raise it up to the standard of Europe. We are discouraged by this plan of Harvard to allow and encourage its students to take branches in which there is so little to promote high intellectual culture. We know what a galaxy of great men appeared in Harvard an age ago under the old training. I know that it is keenly discussed within the college itself, whether there is anything in the present and coming modes of dissipated instruction to rear men of the like intellectual calibres. Has there been of late any great poem, any great scientific discovery, any great history, any great philosophic work, by the young; men of Cambridge? I observe that the literary journals, for which our young writers prepare articles, have now fixed their seat in New York rather than Boston.

The wise leaders of the new de-

* I am waiting to hear whether this challenge is accepted.

parture do not propose to fight against religion. They do not fight with it, but they are quite willing to let it die out, to die in dignity. They have put severe learning on a sliding scale, not it may be in order to a sudden fall, but insensibly to go down to the level of those boys who do not wish to think deeply or study hard. I am glad things have come to a crisis. Let parents know it, let the churches know it, let all America know it, let scholars in Europe know it, let the world know it—for what is done in Harvard has influence over the world. But some timid people will say: "Tell it not in the lands whence our pious fathers came that the college whose motto is *Pro Christo et Ecclesia* teaches no religion to its pupils. Tell it not in Berlin or Oxford that the once most illustrious university in America no longer requires its graduates to know the most perfect language, the grandest literature, the most elevated thinking of all antiquity. Tell it not in Paris, tell it not in Cambridge in England, tell it not in Dublin, that Cambridge in America does not make mathematics obligatory on its students. Let not Edinburgh and Scotland and the Puritans in England know that a student may pass through the once Puritan College of America without having taken a single class of philosophy or a lesson in religion." But whatever others may do, *I say, I say*, let Europe know in all its universities—I wish my voice could reach them all—that in a distinguished college in America a graduate need no longer take what the ages have esteemed the highest department of learning; and I believe that such an expression of feeling will be called forth that if we cannot avert the evil in Harvard we may arrest it in the other colleges of the country.

PREPARATORY TRAINING.

BY J. G. FITCH, M.A.

LET us gather together a few of the plainer results of experience in reference to the teaching of the rudimentary arts of reading, spelling and writing.

One of the first difficulties with which we are confronted is the fact that our language presents so many orthographical and phonetic anomalies. In this respect it differs notably from French, in which there are comparatively few, from German, in which there are fewer, and from Italian, in which there are scarcely any. We all know that ours is a composite speech, a conglomerate of many languages; that the portion of it which was spoken before it was written—the purely English portion and the earlier derivatives from Latin and from Norman French—is full of queer and capricious spelling; while other portions of it, the Greek and the Latin derivatives, which have come to us later through the medium of literature, are, on the whole, spelled according to a consistent system, and present little or no difficulty. If we want an exhaustive and very entertaining summary of the chief difficulties presented by our English system of spelling, I may refer you to Prof. Meiklejohn's clever little book, "The Problem of Teaching to Read." Here it may suffice briefly to indicate the nature of the difficulty which has to be surmounted.

There is first of all our anomalous alphabet. And it would be easy to show that it has every fault that an alphabet can have. A perfect alphabet should, it may well be argued, have a single and fixed character for every single indivisible elementary sound.

It should have such compound characters for composite or diphthongal sounds as would indicate clearly the elements of which they are composed. It should also have similar characters for analogous or related sounds. Nothing is easier than to lay down these conditions, and to see that our alphabet violates every one of them. It is at the same time redundant and defective. It has not enough characters, and those which it has it does not make the best of; *e.g.*,

(1) A single and indivisible consonant is sometimes expressed by a clumsy combination of two letters instead of one character, *thin, thine, should*.

(2) There are often two or more ways of writing the same sound, as *fancy, philosophy, and rough*. *Duty, neuter, lewd, and beauty*. *Nation, sure, shall, vicious*.

(3) The same letter has many sounds, as *father, fan, fate, fall*.

(4) The alphabet disguises altogether the true elements of composite sounds: the sound of *oil* is not of *o* and *i*, but of *au* and *ee*.

(5) It fails altogether to indicate the true relations between cognate sounds; the *i* in *pine* is called the long sound of the *i* in *pin*; but these sounds are not related; the true lengthening of *pin* is into *peen*, not *pine*. So the *p* is related to the *b* in the same manner as the *t* to the *d* or the *s* to the *z*; but there is no such similarity of characters as to represent these relations.

(6) It sometimes gives us a compound sound expressed by a single letter, as *Reject, congeal*.

(7) It more often gives a group of letters to represent a single indivisible sound—*Daughter*, though.

(8) The names of the letters are very misleading as representations of their powers, as *Gee* for G. *Aitch* for H. *Double you* for W.

Such is only a part of the indictment against the English alphabet. Shall we try to get up a society for reforming it? Well, I for one should not. First, because the task is so formidable. To do it effectually we must have thirty-eight characters instead of twenty-six; we must cease to employ many of the letters we now use, and the whole aspect of the written language must be altered. And even when the written language had been truly conformed to the speech of the capital and of educated persons, it would remain untrue and *non-phonetic* in Yorkshire and Devonshire, and even in Scotland and Ireland, unless all provincialisms and dialectic varieties are to be obliterated; which is neither probable, nor in itself eminently desirable. Then the price we should pay for such a reform would be very heavy. We of this generation, who have been educated in the anomalous system, would learn the new one, I grant, without much difficulty; and for our lifetimes both the old and the new literature would be read. But to the next generation, educated on the more rational principle, our present spelling would be hopelessly unintelligible, and the whole of our past literature, everything that is not worth reprinting, would become a foreign language, and would remain unread by our successors. It is not easy to see how such a result could be avoided; yet, if it occurred, the gain would be enormously counterbalanced by the loss.

Again, the difficulties of our present system may easily be exaggerated, and have been exaggerated. The syllables which are not spelt phonetically are,

relatively to the whole language, not very numerous.

Our alphabet also is a historic one, and like the British constitution represents historic growth. Its very anomalies throw a deal of light on the history and origin of words. No doubt the spelling is occasionally misleading too, on this point. If I lay down a rule, that whenever *f* is represented by *ph*, or *k* by *ch*, the word is Greek, or that whenever *c* represents *s* and commences a syllable the word is Latin; or that whenever *w* comes before *h* it is English, we may find exceptions to the rule; yet in nineteen cases out of twenty the rule is good; and thus the very inconsistencies of our alphabet often furnish a key to the meaning or history of a word.

Lastly, I would not advise spending much time on an effort for a sweeping legal reform in our alphabet, because there is little or no chance of its success. Consider what has happened in the matter of decimalizing our weights and measures. Our present arithmetical tables are far more clumsy and indefensible than our alphabet. They give a great deal more trouble to teachers, and of mental entanglement to pupils. Moreover, it would be a far easier process to reform them. Many proposals for adopting the French *systeme metrique*, or at least for decimalizing and simplifying our present weights and measures, have been made from time to time. But the English people and its Parliament have steadily opposed all these projects, and we seem at this moment much farther from the adoption of a rational and simple system of compound arithmetic than we were twenty years ago. And we may conclude, in like manner, that though ingenious proposals will be made from time to time, for the amendment, on philosophical principles, of English spelling, those proposals have little chance of

being carried out in our time. By the general consent of literary and learned people we may fairly hope that some improvements may be effected and the most grotesque anomalies removed. But the conservative instincts of the nation in matters like this are very strong; and I think it in the highest degree unlikely that for the sake of saving a little trouble to teachers, the nation will put itself to the inconvenience of adopting a new alphabet and making a break in the continuity of its own literary life.

So we may make up our minds that any effort to obtain a complete and scientific reform in the English alphabet will probably be futile; and that any other than a complete reform would hardly be worth contending for. It may go a little way to reconcile some of us to this conclusion, if we reflect that after all the anomalies and difficulties do not seem so great to a little child as to us. He accepts the spelling you teach him, on your authority, and he is very little impressed by its want of philosophic

precision. You spell the word *mat*, and as there are three distinct sounds represented by three distinct letters, which are tolerably uniform in their powers, the word satisfies you. And then you spell the word *through*, and you feel it to be unsatisfactory. The first word is spelt philosophically, the second is spelt unphilosophically. But to the child, though one is a little easier than the other, it is just as arbitrary. He receives them both on your authority. To him it is all alike mysterious. Neither his moral nor his phonetic sensibilities are wounded by unphilosophical spelling. You will have to tell him the one word twice over and the other only once. But when once thoroughly known, it is known for life and he will not be troubled by its anomalous character. Nay, he will never know that there is any anomaly in it, until in the fulness of time he is old enough to become a member of the Philological Society or the Spelling Reform Association, and to have his critical faculty called into action under its auspices.—*Central School Journal.*

PARENTS AND TEACHERS.

THE fact is conceded by those who properly understand or appreciate the laboriousness of a teacher's position that his remuneration is frequently incommensurate with the amount of work required of him, and no rightly thinking man will, I believe, dispute the assertion that so long as the teacher can command little more for his service than is paid to an ordinary labourer, just so long will the cause of education be retarded, and no one will have the right to complain if our schools are conducted in a negligent and unsatisfactory manner.

However, in an effort to correct the evils existing in our systems of in-

struction, there is something else to be considered besides dollars and cents.

The conscientious instructor, be he "college professor" or "country pedagogue," is not an automaton that drags listlessly through six hours of labour per day, after the fashion of a horse in a treadmill, contented merely to draw his salary and to retain his place; he is a man of noble principles, who realizes the responsibility of his position; his interests are identical with those of his pupils, and he will bend every energy for their advancement.

To such a man the business of teaching is fraught with many cares,

for, being in thorough sympathy with his pupils, he not only rejoices over their success, but also grieves with them when they fail; thus does he continually alternate between pleasure and sorrow. Where is the individual who can contemplate this veritable hero and not deeply sympathize with his praiseworthy endeavours? Justly does he deserve both adequate pecuniary compensation for his labours and the hearty encouragement and co-operation of his patrons. There exists in the minds of many parents the erroneous idea that they have no part to perform in their children's education, save to pay for their tuition, while the teacher is expected to do the rest. He is required to bear the brunt of pupils' irregular attendance, he must make up for lack of home training and instruction, and yet, in the face of these obstacles, if he, by the end of the session, shall not have carried the child through two or three sets of text books, he is considered derelict in the discharge of duty and much dissatisfaction is felt. I do not advocate parental dictation either in the discipline or mode of instruction in schools, for this would be an unwarranted assumption of authority, and no teacher of spirit will ever brook such interference.

However, private suggestions from

parents, if kindly given, are always in order and would be gratefully received.

Moreover, a parent ought to manifest a genuine interest in the studies and progress of his child. Just here I would say to all parents if in the preparation of lessons at home your children should encounter obstacles that they cannot surmount, and should come to you for assistance, do not tell them you have no time to be bothered and that they must carry their difficulties to the teacher, who is paid to attend to their wants; but cheerfully help them out of the trouble, talk to them about their studies, incite them to more diligent application, and let them feel that you are concerned in their intellectual, as well as physical welfare. Above all, impress upon them the vital importance of punctual attendance at school and the necessity of strict obedience to the teacher's commands.

A little time thus employed will not only greatly facilitate the teacher's labours and conduce to their success, but it will yield you a rich dividend in the more rapid advancement of your child.

May the day be not far distant when parents and teachers, throughout the country, shall learn the importance of greater co-operation.—*W. G. Fox, in Current.*

TEACH the children to use their powers of observation. Most people miss half that is in this world, because they have never been taught to look. Many have wondered at the names which Mr. Dickens introduced into his stories, they seem so wonderfully well fitted to his characters. Many suppose that they were invented by the author, and that they had no existence in real life. This was not so. As Mr. Dickens walked through the streets of London he was accustomed to notice the signs upon the stores and shops. Whenever he noticed one that was peculiar, he put it down in a book. Teach your pupils to gain knowledge from all things about them. Help them to make the heavens and the earth teachers.—*A. D. Mayo.*

THERE is a mystery about the American Lakes. Lake Erie is from 60 to 70 feet deep; but Lake Ontario is 592 feet deep, 230 feet below the tide level of the ocean; and the bottoms of Lakes Huron, Michigan, and Superior, although the surface is much higher, are all from their vast depths on a level with the bottom of Ontario. Now, as the discharge through the River Detroit does not appear by any means equal to the quantity of water which the three upper lakes receive, it is supposed that a subterranean river may run through from Lake Superior, by the Huron, to Lake Ontario. This is not impossible, as salmon and herring are found in all the lakes communicating with the St. Lawrence, but no others.—*School Journal.*

THE PENALTIES OF EDUCATION.

MOST middle-aged persons can well remember the time when a very usual copy set for the youthful penman was, A good education is better than riches. Many a poor parent to-day consoles himself for his poverty in the reflection: I am not able to bequeath any money to my children, but I have given them what is really better—a good education.

This putting of education in the scales against a veritable money-bag is by no means a tradition. It is the prevalent method of estimating the value of education, although the method seems to be somewhat on the decline.

The conviction is planting itself that education is not an unmixed good. Prof. Swing, in a late sermon, presents forcibly some of the considerations that begin to impress society. Even educators cease to swell with resentment at the insinuation that the common schools have a tendency to render hard labour ignoble in the eyes of our youth.

It is a pleasant sign that Prof. Swing, in the midst of the temptations of his discourse, avoids the usual though shallow thrust at the public schools. He evidently feels what, it would seem, any fair observer must see, that it is silly to put upon the schools, a feeble agency in comparison with the total sum of education, any large responsibility for what is the general result of a literary education no matter how obtained. And educators ought to see, as some of them do, that it is equally silly to deny that the tendency of the schools is in inevitable accord with the universal result of education upon individual character. The thing to hold accountable is education in general, and not our schools in particular.

However it might be in the case of an ideal education, it seems beyond dispute that the actual effect of securing that mental power and superiority which are implied in the term education or its semblance, is to beget a self-consciousness and an aspiration that are not content with the drudgery that makes a living by hard labour.

It is not among the least of the blessings of education that it does beget this aspiration, this ambition. The effort and desire to escape mere physical labour is a strong lever in promoting both race and individual elevation. That along with this ambition often go vanity and a false estimate of what is worthy is one of the penalties that come from partaking of the tree of knowledge. But they are the accompaniments of that little learning which makes one mad, an amount that unfortunately, a large part of mankind never get beyond.

Whether the education that stops here, leaving these defects in the character, is more of a blessing than a curse to the individual and to society may be a question. But if this stage were never reached there would be no hope of reaching the stage beyond which is full of health and blessing. The evil must be endured, or the subsequent good cannot be attained. It is a penalty entailed by human nature.

But those who take to education simply as a business investment, a means of livelihood, not unfrequently pay a heavy penalty in prolonged disappointment and unrest. For them there is a sad irony in the statement, Education is better than riches. The lie is given to it by the money-getting experiences of life. Solid, thorough going education cuts no creditable

figure as a mere money-getter in competition with that smart, trade intelligence, which may be absorbed without ever seeing a book, school, or college. If we would avoid the penalty we must abandon the idea, and never permit our children to get

it, that there is money in an education, therefore let us get an education. We must teach them an education means, or ought to mean, manhood, character, power to extract happiness and good from life, irrespective of the wealth we may possess.—*Intelligence*

SCRIPTURE LESSONS FOR SCHOOL AND HOME.

BY THE REV. J. WYCLIFFE GEDGE, M.A., INSPECTOR OF SCHOOLS FOR WINCHESTER, ENG. (NOTES FOR TEACHERS.)

NO. 5. THE FOURTH COMMANDMENT. PART I.

INTRODUCTION. This Commandment contains two separate parts, viz., observance of the Sabbath and observance of the other days. Rest on the Sabbath, labour on six days. Will take the first day.

I. SIN FORBIDDEN. *Work on Sabbath.* (Read Exod. xx. 7-11.) Command very distinct—Jews were to do no work, *i.e.*, no work of earning living, getting daily bread. Remind how were taught this when manna was given. (Exod. xvi. 27-30.) None fell on Sabbath, but twice as much given the day before. Not allowed to light a fire. See Num. xv. 32-36 for punishment of man who gathered sticks.

What is first word of this Commandment? Reminds of first appointment of Sabbath. When was that? (Read Gen. ii. 2, 3.) Six separate acts of creation—then rest. Correspond to our days. Tells the reason why this day observed. God hallowed it, *i.e.*, set it apart from other days; sanctified it or made it a holy day.

II. DUTY ENJOINED. *Rest and worship.* Why rest? Because rest from work necessary, or man would

soon die. Because, also, would become too much taken up with things of this life, and would soon forget God. Therefore not to be spent in idleness. Is to be holy rest-day for special worship. Jews had "holy convocation" or meeting for worship (Lev. xxiii. 3), a double sacrifice was appointed. Afterwards, the "Law and the Prophets"—*i.e.*, Chapters from the Bible—were read and explained in the Synagogue. (Acts. xiii. 27.)

But we are Christians. Is this binding upon us? We keep the first day, not the seventh—why do we? Remind how Christ rose from the dead on the first day (Matt. xviii. 1), how the Holy Ghost came on the first day. So in the Acts find that Apostles kept both days (see Acts xiii. 14; xx. 7); but gradually keeping of the seventh day dropped, and first remained—called the Lord's Day (Rev. i. 10), has always been kept since. But how is it to be kept? As Jews kept Sabbath to remind how were set free from being slaves in Egypt, so we keep Sunday to teach how all set free by Christ from sin and Satan. Is to be day of holy rest. (a) *Lay aside usual work*, with its cares, bustle, anxieties. Still may do works of necessity, and works

of mercy—helping the sick, cheering the sad, teaching the ignorant. But above all, is to be day for (*b*) *Worship*. This always been so with Jews and Christians. Day for prayer, praise, reading God's Word, preparing for heaven. For this have example of Christ Himself. "A Sabbath well spent brings a week of content." Best preparation possible for heaven.

LESSON. *There remaineth a rest for the people of God.*

PART II.

INTRODUCTION. Ask a few questions on the last lesson. What did we learn from fourth Commandment? Sabbath day for rest and worship. The day changed by early Christians from the seventh to the first. Why? What works may be done on Sunday? So far, only half the Commandment; the other half to-day. Not only *rest* on Sabbath, but *work* on other six days.

I. THE DUTY ENJOINED. *Work*. (Read Ex. xx. 9; Gen. ii. 15-20.) Story of creation well known. World made in six days or periods of time, with intervals between; that is to say, *God worked*. Man made in God's image. (Gen. i. 26.) To be like God. As far as possible to imitate God. Therefore, Adam taught to work. What was he to do in Eden? (*a*) *Till the earth*. World had been made very good. Made more beautiful by man's work. See this still. Illustrate by flowers; *e.g.*, wild roses, small and scentless; cultivated, become large, beautiful, and full of scent. Compare wild fruits, strawberries, plums, etc., with those grown in gardens. On other hand, gardens neglected become deserts.

Remind how man's sin brought curse on ground. (Gen. iii. 18, 19.) Thorns and thistles began to grow; ground requires much more hard labour now than did at first; work

often full of sorrow; difficult to get daily bread. Still, in all labour is profit (Prov. xiv. 23), and the diligent are made fat. Take as examples Jacob serving under Laban faithfully (Gen. xxx. 30), Joseph with Potiphar (Gen. xxxix. 2, 3), or Ruth gleaning in the fields of Boaz. So, to this day, diligence in work brings reward—honour, success, independence. Another kind of work given to Adam. (*b*) *Dominion over animals*. He gave names to animals, subdued them. But animals became wild; yet still are subdued by man. Instance lions tamed (James iii. 7), oxen used in ploughing, horses trained for riding and driving, dogs used in sledges, etc. Therefore this Commandment teaches also duty to dumb animals. What does it say about them? They must have day of rest. God cares for cattle as well as His other creatures. So must we. Duty to treat them kindly, let them have needful rest.

II. SIN FORBIDDEN — *Idleness*. (Read Prov. xv. 19; xix. 24; xx. 13.) All these verses, and many others, rebuke sloth. Such people called idle, lazy, sluggards, etc. Commandment tells us to labour or work hard; *i.e.*, not be idle. St. Paul says if a man will not work, shall not eat. Describe the farm of an idle man. Weeds choking corn because not plucked out when small; hedges not mended, letting in cattle; end poverty. So a lazy child will not get up in the morning; careless about learning lessons; grows up in indolent habits; comes to poverty and perhaps shame.

Remind how Christ was eager to learn. Asked questions of doctors, and thus did His Father's business. (Luke ii. 49.) This learning especially the work of all children. Must remember that to do that well is to do their Father's business.

LESSON. *Study to be quiet, and to do your own business.*

THE CHINOOK WIND.

THE winter climate of the strip of tableland and prairie lying just east of the Rocky Mountains is far milder and more varied than that of Manitoba. Except British Columbia, it is the only part of Canada where horses and cattle can shift for themselves, and yet come through the winter in good condition, and this is owing mainly to the warm westerly winds called chinooks.

After a longer or shorter siege of intense cold a change comes. A long, strange bank of clouds rises over the mountains and advances towards the plains, and suddenly out of the passes blows a strong, warm wind, a beneficent fairy from the mild Pacific, sweeping away the snow with its magic wand, and sending the mercury up fifty degrees in an hour or two. Smiling spring wrests the sceptre for a time from cruel winter. As one recedes from the mountains, however, the effects of the chinook grow less and less perceptible, and are at length entirely lost. As one advances up the passes, also, the west wind, which blew violently at the mouth, gradually loses its force, and well up among the mountains is no longer felt as wind, though a peculiar mildness of the atmosphere indicates its passage overhead.

Since the wind from the Pacific must cross three or four hundred miles of intensely cold snow and glacier-covered mountains, many have thought it impossible that it should still have warmth enough to melt the

snow when it reaches Calgary or McLeod, and have looked for some other explanation. There is no doubt, however, that the chinook does cross the mountains and issue from the passes, so that no explanation can be accepted which does not accord with these facts.

A little thought on the physical properties of gases makes the matter clear. It is a well-known law that heat is rendered latent when gases expand, and may be recovered when they are compressed. By compressing air powerfully under a piston, heat enough may be set free to set fire to tinder.

The warm moist winds from the Pacific sweep up against the mountains, are milked of their load of moisture by the icy summits, and thus gain the latent heat of the watery vapour, which falls as snow. They grow rarer and rarer as they rise above sea-level, and become correspondingly colder; apparent heat becoming latent and serving to keep the molecules of air asunder. When the mountains are crossed the air descends, is condensed, and giving out the heat which had been latent, becomes once more a warm wind.

The west wind which blows keen and icy on the mountain tops, by sinking a few thousand feet becomes balmy and springlike. The very same air which is below zero at the summit two or three hours later is thawing the snow on the plains and uncovering for the cattle their winter pasture.—*V. P. Journal.*

GEORGE DICKSON, M.A., for several years the successful Principal of the Hamilton Collegiate Institute, has been appointed to the principalship of Upper Canada College. Mr. Dickson's energy, administrative ability

and experience as a practical educator will be of great service to the school over which he has been called upon to preside. We wish him and Upper Canada College long life and great prosperity.

THE ACADEMIC NEW YEAR.

AT the civil new year, amongst the many warm greetings and customary words of kindly speech, we bespoke the season's salutations; but this season of the year, the last month of harvest, is in a very special sense the teacher's New Year. During our vacation of six weeks, more or less, bringing to us renewal of spirit and increase of knowledge and power, the opportunity has been afforded for reviving our acquaintance with nature as seen in our extensive and varied scenery of Canada, with eyes trained and open to behold the virgin beauty of the young Dominion, displayed on mountain side, by sweeping river, or through the multitudinous sounds of loch and lake. All these no doubt have been put under contribution by some of us during these swiftly passing weeks: others doubtless have secured nooks and corners with relatives and friends on our well managed farms. We have watched with appreciative eye the field full of the promise of a bountiful yield for the husbandman's toil of faith; the fulness of green; the crowding thickness of stalk; the gracefulness of blade swayed by the quiet breeze; the innumerable straight heads of grain glancing in the summer sun; the rapid change of colour, the pleasing green giving place to the promise; filled yellow, and then comes the word: "Cast in the sickle, for the harvest is come." Thus meditating, the soul of the tired labourer, who has turned aside to rest a while, is re-encouraged and strengthened by seeing the work of the Master in the fields of the farmer. He enters with renewed confidence upon his field of appointed activity in sure and certain hope of worthy return in the future health and blessedness of his country. Therefore, from farm-house, from hill and plain, from lake and river, from home of

friend or relative, we come in this month of blessed fruition to tread with hopeful hearts the allotted path in crowded city or rural section, richer in the coming years for this brief sojourn, this communing with Nature in fair young Canada. It is ours, consciously or unconsciously, to begin a work the result of which is infinite; ours to take the place and the authority of father and mother; the God appointed school-masters of "all the ages," ours the most difficult duty given to man, the effort to make the blind to see, the lame to walk. What rare skill is wanted here, what indefatigable patience, what consummate wisdom, just to give "here a little and there a little, line upon line, precept upon precept," so that the best is done for body, soul and spirit! Let us therefore go forth, each to his field of labour, strong and quitting ourselves like men, no hirelings we; but men and women on business intent, failing sometimes, failing badly, but asking mercy for shortcomings. We know that the success, even the effort to do our best, will receive recognition more than human spirit can conceive.

To the teaching army we say Happy New Year.

THE TEACHER.

"I would rather have my son with 'a Teacher' in a cedar swamp than in the most costly building with best appliances without 'the Teacher.'" The speaker was the Grammar School Inspector, and it is some years now since the statement was made in the hearing of a young man beginning his life-work as a teacher. The building was unsuitable, the floor uneven; you must walk warily or a stumble would come to you by knocking your toe against the edge of a board higher than its fellow; the boards on the outside of the building were in some places loose and curved by the sun.

Two or three teachers taught in the large central room, there was one long narrow class-room in which one master could teach. "I have done my best for you," the Inspector said. "I have spoken to the chief superintendent and together we have considered the position of matters. Good days are coming for your school," and then followed the above significant words. The words were prophetic, the school is now different in every respect, the building is suitable, the appliances sufficient for good practical teaching, and "the Teachers" are there. Many a time in the past years have these words supplied stimulus and staying power; many an incident recalled the scene. They came forcibly recently upon reading an anecdote in the life of the late President Garfield. It is related that his old college was renovated, improved and enlarged; there was a gathering of the alumni and the future President spoke. He did not belittle the material enlargement, he rejoiced with the others in the evidences of prosperity at Williams College; but, he added, if a choice had to be made, the new college without his former master, or the master sitting on one end of a log and he on the other, he would prefer his former master on the log.

Are we not in danger of forgetting the inherent truth embodied in these statements, dissimilar in form but breathing the same spirit. It is right and becoming that masters and pupils should have suitable buildings and appliances for their work, helpful to have a school system and a Minister of Education. Within proper limits Inspectors may also assist; but all these are the machinery. The living power, the moulder, the energizing agent, is the teacher. Unless he is loyal to truth, faithful in work, permeated with an abiding sense of his responsibility in dealing with spirits and accountability to the Great

Teacher of spirits, all is vain, "of the earth, earthy," with assured results as bitter and disappointing as the apples of Sodom. Seeing that the case is so, let parents (the responsibility is theirs) give the most vigilant attention to secure the right teachers for their children, pay them so that they can live comfortably, provide houses for them, keep them permanently, or at least while they are able to teach, thus enabling them to spend their lives in comparative freedom from care, and depend upon it the result will be a harvest of precious gain to the country. Our most precious want educationally is not regulations, programmes, etc., but how to get and retain good school-masters.

REVISED CURRICULUM IN ARTS.

FOR years past the Senate of the University of Toronto, at the end of certain intervals of time, has carefully revised the curriculum for the whole four years' course. The last revised curriculum is now issued. The part setting forth the work required for junior matriculation was sent to the schools some months ago. Some important changes are made in the curriculum. Those connected with the matriculation examinations interest chiefly the secondary schools.

Writing from dictation is now required from candidates in honors in French and German. To write any language from dictation is one of the very best tests of a candidate's knowledge of the language. If practicable it would be well to have the same test in English for all candidates. A prose work is prescribed for each year and the themes for composition are to be set on these works. This arrangement affords an opportunity to students to prepare themselves for their compositions required of them in the Hall on the day of examination. In classics the only change of any

moment is that the first forty exercises of Bradley's Arnold's Prose Composition are prescribed, and prose composition is required of candidates for honors in Greek. Owing to the scheme adopted for passing examinations in the years subsequent to the first no scholarships are given from University funds. Knowing the good effects of these scholarships, and the valuable assistance they are to undergraduates, we hope our wealthy and public-spirited men will come forward and generously make provision for the continuance of the scholarships.

Too great importance can hardly be attached to the recognition given by the Senate to Church History, Apologetics, Biblical Greek, and Biblical Literature, branches of learning taught in the theological colleges affiliated with the University of Toronto. We shall watch the working of the new departure with much interest and expect from it satisfactory results.

THE TEACHERS' ASSOCIATION.

THE Annual Convention was held in the Public Hall of the Normal School during the second week in August. The Convention was called to order by Dr. Parslow, first Vice-President, who took the chair in the absence—through illness—of the President, Dr. McLellan, and the proceedings began by reading of Scripture and prayer. After the transaction of some preliminary business, it was arranged that the Hon. Mr. Ross, Minister of Education, should occupy the time allotted to Dr. McLellan for his address in the evening. During the afternoon session, a paper was read by Mr. Inspector Glashan, Ottawa, "A Plea for the Study of Science in Schools," and Mr. William Houston, M.A., delivered an address on the Study of English. The

Minister engaged the attention of the Convention during the evening session, reading and explaining the proposed programmes of studies for Public and High Schools, also the proposed regulations for the management and conduct of our schools, and answering questions asked by members and giving explanations of the changes and amendments proposed.

The Convention re-assembled the second day (Wednesday) at 2 p.m. Dr. Nelles, Principal of Victoria University and a former President of the Association, being present, was introduced to the Convention. The rev. gentleman was well received, many of the members being pleased to see him amongst them again looking so hale and hearty. He informed the Convention of the sudden illness of Dr. Allison, Chief Superintendent of Education, Nova Scotia, and that for this reason he would not be able to deliver his address in the evening. Thereupon it was agreed that the Convention would devote the evening session to the consideration of federation of the colleges, led by Principal Nelles.

On this afternoon Mr. Inspector Fotheringham, Aurora, read a valuable paper on the "Permanency of the Teaching Profession." This paper, which we print in this number, deals with a subject of great importance to the country, and is receiving much attention from educators in all English speaking communities, especially in Great Britain and the United States of America. The next theme for consideration, "The school-room as a preparation for the farm and workshop," was introduced by Mr. Inspector Smith, Ancaster. We hope shortly to have a paper or two published in the magazine on this live question.

The evening session of the Convention was unique in its character. Instead of having a public address, there was an open meeting on the

University Confederation. Dr. Nelles explained in genial and humorous terms the various steps taken towards the federation of the Universities of Ontario, and urged upon the attention of the educators of Ontario, in harmony with the view taken by him in the address published by us in the July-August number of this magazine, the far-reaching results of the scheme now under consideration. Dr. Dewart followed in the same line of argument, reading extracts from a pamphlet lately published by him on this subject and adding other pertinent remarks. Mr. Macallum, B.A., justified the action of Queen's University refusing to enter confederation on the ground that it is not in the interest of the higher education of the country to have all the colleges in one place, but he would be pleased to see public aid given to the University of Toronto.

Samuel Woods, M.A., spoke as a graduate of the University of Toronto, pointing out the concessions which that institution was called upon to make in entering such a scheme as the proposed one.

The first item on the order of business Thursday afternoon was the election of officers. These are the following for the ensuing year: President, Samuel MacAlister, Esq., Toronto; Recording Secretary, R. W. Doan, Esq., Toronto; Corresponding Secretary, D. H. Hunter, M.A., Woodstock; Treasurer, W. J. Hardy, Esq., Toronto. Mr. Thomas Swift, Ottawa, read a paper on "Reading as a part of Elocution," the discussion thereon exhausted the business for this session.

At the evening meeting two scholarly and valuable papers were read, one by the Rev. Dr. Body, Provost of Trinity College, Toronto, on "Education and Character," the other by

Dr. Allison, Nova Scotia, on the "Development of Education." We hope to find space for these timely contributions in the pages of THE MONTHLY. After some routine business was attended to, the Convention was brought to a close by all present joining heartily in singing the National Anthem. Space forbids our attending in any form to the work done by the different sections of the Association, another time may present a more favourable opportunity.

PROFESSIONAL TRAINING OF TEACHERS.

THIS question has been repeatedly before the Teachers' Association. Two years ago a paper was read in the High School Masters' section, and a committee appointed to consider the whole subject. The Minister of Education is proposing to treat the professional training of teachers for High Schools after the manner in which it has been dealt with for Public Schools. It seems to us unreasonable to ask schools whose special function it is to foster and promote sound scholarship to undertake also the onerous work of showing teachers how to teach. To men so actively engaged as the principals and masters of those schools the proper preparation of teachers for our secondary schools would be a most serious task. We will not follow the subject further at present; and we do this all the more readily, because a co-worker of much experience, and well qualified to speak on the question, has kindly undertaken to write a series of articles for this magazine, beginning with the September number. We invite discussion on the question of professional training of teachers.

SCHOOL WORK.

MATHEMATICS.

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

EDUCATION DEPARTMENT,
ONTARIO.

JULY EXAMINATIONS, 1885.

Second Class Teachers.

ALGEBRA.

Examiner—J. C. Glashan.

1. From $a(b+c)^2 + b(c+a)^2 + c(a+b)^2$
take $(a-b)(a-c)(b+c) + (b-c)(b-a)(c+a)$
 $+ (c-a)(c-b)(a+b)$. *Ans.* $12abc$. [10.]

2. Multiply $\frac{x}{a} - \frac{a}{x} - \frac{y}{b} + \frac{b}{y}$
by $\frac{x}{a} - \frac{a}{x} + \frac{y}{b} - \frac{b}{y}$

Ans. $\frac{x^2}{a^2} - \frac{y^2}{b^2} - \frac{b^2}{y^2} + \frac{a^2}{x^2}$. [10.]

3. Divide $(x^3 - 1)(a^3 - a^2) - (x^2 - 1)$
 $(a^2 - 4a) + 3(x+2)(a-1) + 3$
by $ax^2 + (x+1)(a-1)$.

Ans. $a^2x - ax - a^2 + a + 3$. [15.]

4. Resolve $2 - \frac{b^2 + c^2 - a^2}{bc}$ into the pro-
duct of two factors.

Ans. $\frac{(a+b-c)(a-b+c)}{bc}$. [10.]

5. It being given that $2(a^4 + b^4 + c^4 + d^4) -$
 $(a^2 + b^2 + c^2 + d^2) + 8abcd$, is the product of
four linear factors of which one is $a+b+c$
 $+d$, show how to deduce therefrom what
the other factors *must* be. [20.]

6. Prove that if $\frac{ab}{cd} = \frac{a^2 + b^2}{c^2 + d^2}$

then will $\frac{AB}{CD} = \frac{A^2 + B^2}{C^2 + D^2}$,

wherein $A = a + b + c + d$,

$B = a + b - c - d$,

$C = a - b + c - d$,

$D = a - b - c + d$. [20.]

7. Solve $\sqrt{x} - \sqrt{5} = \sqrt{(x-5)}$ *Ans.* $x=5$.
[15.]

8. Determine a, b and c so that the two
systems of equations

$$\left. \begin{aligned} ax + by - cz &= 4, \\ ax - by + cz &= 8, \\ -ax + by + cz &= 16 \end{aligned} \right\} \text{ and } \left\{ \begin{aligned} 2x - y + 3z &= 9, \\ 3x + 2y - 2z &= 1, \\ -x + y + z &= 4, \end{aligned} \right.$$

may be satisfied by the same values of x, y
and z . *Ans.* $a=6, b=5, c=4$. [15.]

9. So've

$$(1-x)(x-2) + (3-x)(x-4) - (5-x)(x-10) = 0.$$

Ans. $x=4$ or -9 . [15.]

10. The circumference of a hind-wheel of
a carriage is greater by one yard than that of
the front-wheel, but in travelling sixty-three
yards, the front-wheel makes four revolutions
more than the hind-wheel. Find the circum-
ference of the hind-wheel. *Ans.* $4\frac{1}{2}$
yards. [20.]

First Class Teachers.

ARITHMETIC.

Examiner—J. A. McLellan, LL.D.

NOTE.—80 per cent. of this paper will be
considered a full paper.

Solutions by Geo. Ross, B.A., Mathematical
Master C. I., Galt.

1. "Every operation of division may be
viewed as giving the answer to two different
questions." Explain and illustrate this
statement.

1. A good treatment of this question will
be found in Clifford's "Common Sense of
the Exact Sciences," pp. 42-45.

2. Show that if the greater of two integers
be divided by the other, the greatest com-
mon measure of the two numbers is the
same as the G. C. M. of remainder and
divisor.

2. Book-work.

3. Divide the fraction $\frac{1}{2}$ into two such
parts that 4 times one of them added to $5\frac{1}{2}$
times the other may make $1\frac{1}{2}$.

3. 4 times one part + 4 times other part
 = 4 times fraction = $\frac{3}{4}$, 4 times one part +
 $5\frac{1}{2}$ times other part = $1\frac{1}{2}$.

$\therefore 1\frac{1}{2}$ times one part = $-\frac{3}{4}$.

\therefore one part = $-\frac{3}{4} \div \frac{3}{2}$, etc.

4. When a vulgar fraction is to be reduced to a decimal, show how to determine (a) whether the result will be a finite decimal or a pure circulating decimal, or a mixed circulating decimal; (b) the number of non-repeating digits in each case.

4. Book-work.

5. A man barter 120 yards of silk, which cost \$1.50 a yard, and sells at \$2.50, giving nine months' credit, for cloth which sells at \$2 on six months' credit. How much cloth ought he to receive?

5. \$1 profit arises from 9 mos. credit, \therefore \$3 profit will arise from 6 mos. credit on \$1.50, i.e., \$4 on \$9 invested; \therefore the prime cost of second material is $\frac{1}{3}$ of \$2. Hence the number of yards which buyer should receive = $120 \times \frac{2}{3} \times \frac{1}{3} \times \frac{1}{2} = 130$ yds.

6. A, B, C and D together do a work for which A by himself would require two hours less than B. A and B together could do it in $\frac{3}{4}$ of the time C and D together would take, and B and C in $\frac{3}{4}$ of the time A and D would take. Find the time each person singly would require to do the work.

6. A, B, C, D together would do $1\frac{3}{4}$ of the work which A and B would do in same time, \therefore A and B would do $\frac{1}{1\frac{3}{4}}$ of whole work if all were working. Similarly, it may be shown that A and C would do $\frac{1}{1\frac{3}{4}}$ of whole work, C and D $\frac{1}{1\frac{3}{4}}$ of whole work, and B and D $\frac{1}{1\frac{3}{4}}$ of whole work. \therefore A does $\frac{1}{1\frac{3}{4}}$, B $\frac{1}{1\frac{3}{4}}$, C $\frac{1}{1\frac{3}{4}}$, and D $\frac{1}{1\frac{3}{4}}$ of whole work. \therefore A will require 8 hrs., B 10 hrs., C 12 hrs., and D 16 hrs. to finish the work.

7. Two trains whose lengths are 420 ft. and 460 feet respectively, pass each other in 30 seconds when moving in the same direction, and in $7\frac{1}{2}$ seconds when moving in opposite direction. Find the rate of each train in miles per hour.

7. The sum of the rates at which trains are going is a rate of 420 feet + 460 feet = $\frac{1}{2}$ mile.

$\frac{1}{2}$ mile in 30 mins. = 20 miles per hour,

$\frac{1}{8}$ " $7\frac{1}{2}$ " = 80 "

80 miles per hour = combined speed,

20 " = difference of speeds,

\therefore 50 miles and 30 miles per hour respectively.

8. The circumference of one circle is $27\frac{1}{2}$ feet longer than that of another, and 11 times the diameter of the first is equal to 5 times the circumference of the second. Find the diameter of each, π being assumed = $3\frac{1}{7}$.

8. From the question the diameter of first circle is $\frac{5}{11}$ of $27\frac{1}{2}$ ft. = $2\frac{3}{4}$ ft. longer than diameter of second. But 11 times diameter of first = $1\frac{1}{5}$ of diameter of second; \therefore first diameter = $\frac{1}{5}$ second diameter; \therefore $\frac{3}{4}$ second diameter = $2\frac{3}{4}$ ft.; \therefore second diameter = $20\frac{1}{4}$ ft., etc.

9. Find the square root of '00013 to within less than a millionth, and the value of $\sqrt{[(2+\sqrt{2})(2+\sqrt{2})]}$ to within less than a ten-thousandth.

9. (1) '011401, (2) 1'9422.

10. The length of an iron cylindrical vessel with closed ends is four feet, and its outside circumference is 40 inches, and the thickness of the metal one inch. Find the entire weight when the cylinder is filled with water, iron being $7\frac{1}{2}$ times heavier than water, and water weighing $62\frac{1}{2}$ lbs. per cubic foot.

10. Radius of cylinder = $\frac{7}{4}$ inches.

\therefore weight of water =

$$\frac{22}{7} \text{ of } \left(\frac{59}{11}\right)^2 \times 48 \times \frac{125}{2} \times \frac{1}{1728} \text{ lbs.}$$

The weight of iron =

$$\frac{22}{7} \left\{ \left(\frac{70}{11}\right)^2 - \left(\frac{59}{11}\right)^2 \right\} \times 48 \times \frac{62\frac{1}{2}}{1728} \times 7\frac{1}{2} \text{ lbs.}$$

11. I hold some 3 per cent. stock; on receiving my first half year's dividend I invest it in the same stock at $93\frac{3}{4}$, and my next half year's dividend is \$1905. What amount of stock had I at first?

11. Half year's dividend + $\frac{1\frac{1}{2}}{93\frac{3}{4}}$ of half

year's dividend = \$1905; \therefore half year's dividend = \$1875; \therefore he held 1250 shares at first.

12. (a) The area of each of the longer walls of a room is 360 feet, that of each of the other walls is 192 feet, and that of the floor is 480 feet. How many yards (linear) of paper, 18 inches wide, will be needed for the walls, deducting one-twenty-fifth of the whole area for doors, etc.

(b) Find the depth of a ditch, the transverse section of which is a trapezoid, of which the longer side is 20 feet, the slopes of the sides 2 in 1 and 3 in 1 respectively, and the area 146.25 square feet.

12. (a) Since the area of the walls is 1114 square feet, the number of yards of paper required =

$$\frac{24}{25} \times 1114 \times \frac{2}{3} \times \frac{1}{3} = 237.653 \text{ yards.}$$

(b) Denote the depth by d . Then proceeding $\frac{1}{3}d$ from one side of the ditch and

$\frac{1}{2}d$ from other side, along the top we see

that width of bottom of the ditch = $20 - \frac{5}{6}d$.

\therefore the area of the transverse section

$$= \frac{1}{2}d \left\{ 40 - \frac{5}{6}d \right\} = 146\frac{1}{2}.$$

$\therefore d=9$ or 39 ft. An examination of the latter value shews it inadmissible.

Second Class Teachers.

ARITHMETIC.

Examiner—J. J. Tilley.

NOTE.—Eight questions will be considered a full paper, but the 5th and 10th must be taken.

1. A man bought a house which cost him 4 per cent. on the outlay to put it in repair; it remained empty for a year, during which time he reckoned he was losing 5 per cent. on his total outlay. He then sold it for \$1192, which paid for repairs and loss and also gave a profit of 10 per cent. on the cost price of the house. Find the cost price.

Ans. \$1000. [25.]

2. A railway train moving with uniform speed is met and passed in 5 seconds by an engine and tender $30\frac{3}{8}$ feet long and running

30 miles an hour; the engine and tender return shortly afterwards and pass the train in 25 seconds after overtaking it. Find the length of the train. Ans. 336 ft. [25.]

3. A person invested \$8420 in 8 per cent. stock on the 7th day of January at $109\frac{1}{2}$, and on the 12th day of February of the same year sold it out at $117\frac{1}{2}$, paying $\frac{1}{2}$ per cent. brokerage on each transaction. Find his gain per cent. on what the stock cost him—money being worth 8 per cent. per annum (360 days). Ans. 6.906 per cent., interest being deducted. [25.]

4. A merchant bought 3885 yards of cloth and marked it at an advance of $33\frac{1}{2}$ per cent. on cost; in selling the first half of it he gave only 35 inches for a yard, but in selling the remainder he gave 37 inches for a yard. He gained on the whole transaction \$3897. What did the cloth cost him per yard?

Ans. \$3.00. [25.]

5. I bought French goods for 7490 francs, and paid an import *ad valorem* duty of 15 per cent. I sold the goods for £420. Find my gain or loss in dollars and cents if the £ = fr. 25.22 = \$4.87.

Ans. \$382.1294. [20.]

6. I invested in 7 per cent. stock at $78\frac{1}{2}$. and having received a half year's dividend I sold out at $79\frac{3}{8}$, paying $\frac{1}{8}$ per cent. brokerage on each transaction, and increased my capital altogether by \$292.50. How much did I invest?

Ans. \$5086.25. [25.]

7. In an election 15 per cent. of the constituency refused to vote; of two candidates, one received 45 per cent. of the votes in the constituency and was elected by a majority of 150. Find the number of votes cast for each. Ans. 1200 and 1350 votes. [25.]

8. A person bought a quantity of goods for \$224, payable in 2 months, and sold them at once for \$274, payable in 4 months. Find the gain in ready money allowing trade discount at 6 per cent. per annum.

Ans. \$46.76. [25.]

9. A, B and C walk from P to Q each at a uniform rate, A's rate being equal to $\frac{2}{3}$ of C's, and B's rate was 4 miles an hour. B started 45 minutes after A, and C started

27 minutes after B. They all arrived at Q at the same time. Find the distance from P to Q. *Ans.* 21 miles. [25.]

10. (a) A triangle, altitude 60 feet, is bisected by a line drawn parallel to the base. Find the perpendicular distance between the base and the dividing line. [15.]

(b) The areas of the several faces of a rectangular solid are 57, 27 and 19 square feet. Find its dimensions. *Ans.* $6\frac{1}{2}$ ft., 9 ft., 3 ft. [15.]

EUCLID.

Examiner—J. Dearness.

NOTE.—Symbols, except of operation, may be employed. Use capital letters with the diagrams. It is recommended that each step in the demonstration begin on a new line.

1. When is one proposition said to be the converse of another? [3.]

State the converse proposition of I. 41. If a parallelogram and a triangle be upon the same base, etc. [3.]

Show by an example that the converse of a true proposition is not necessarily true. [3.]

2. If one side of a triangle be produced the exterior angle is greater than either of the interior opposite angles. (I. 16.) [10.]

3. In the figure of the preceding, let *AC* be the side bisected in *E*, and produce *BE* to *F*; similarly bisect *BC* in *H*, join *AH* and produce it to *L*; join *LB* and *FA* and produce them to meet in *M*. Show that the triangle *FML* is quadruple of the triangle *ABC*. [10.]

4. Show whether the angles of a triangle can be changed without changing (shortening or lengthening) the sides. [8.]

Also whether the angles of a quadrilateral (as of a rhombus) can be changed without changing the length of the sides. [8.]

5. If the vertical angle of an isosceles triangle is two-thirds of two right angles the square on the base is equal to three times the square on one of the equal sides. [10.]

6. If a straight line be divided into any two parts the square on the whole line is equal to the squares on the two parts together with twice the rectangle contained by the parts. (II. 4.) [10.]

Enunciate the geometrical proposition expressed by the equation $(a+b+c)^2$

$$= a^2 + b^2 + c^2 + 2ab + 2bc + 2ca. [4.]$$

Construct it geometrically. [4.]

7. If a straight line be divided into any two parts, the squares on the whole line and on one of the parts are equal to twice the rectangle contained by the whole and that part together with the square on the other part. (II. 7.) [10.]

Show from the demonstrations of II. 4, and II. 7, that the square on the sum of two lines is as much greater than the sum of their squares as the latter is greater than the square of the difference. [4.]

Illustrate the same truth algebraically. [3.]

8. Divide a given straight line into two parts so that the rectangle contained by the whole and one of the parts shall be equal to the square on the other part. (II. 11.) [10.]

Show algebraically that the square on the sum of the whole line and the lesser segment is equal to five times the square on the greater segment. [4.]

9. In every triangle the square on the side subtending any of the acute angles is less than the squares on the sides containing that angle by twice the rectangle contained by either of these sides and the straight line intercepted between the perpendicular let fall upon it from the opposite angle, and the acute angle. (II. 13.) Deal only with the case of the obtuse-angled triangle. [10.]

(Total 114. Count 100 marks a full paper.)

CLASSICS.

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

EDUCATION DEPARTMENT,
ONTARIO.

JULY EXAMINATIONS, 1885.

Third and Second Class Teachers.

LATIN AUTHORS.

Examiner—J. E. Hodgson, M.A.

Candidates for III. take A and B. Candidates for II. take B and C.

Translate: A.

Jucundum potius, quam odiosum! . . .
sed in literis certe elaboravi.—C. M. [15.]

1 Parse fully:—*potius, indole, fit, minus, ale, versibus, senem, cupiens, exemplis, illud.* [10.]

2. Give the derivation off:—*adolescentibus, virtutum, atque, aliquid.* [2.]

3. *Quid, qui etiam addiscunt aliquid, vellem equidem et illud.* Supply the ellipses. [3.]

4. *quibus uti.* Name four other verbs that govern the ablative. [2.]

5. Distinguish:—*colentur, diliguntur; aliquid, aliquod; quotidie, in dies; literas, epistolas.* [4.]

6. *sed in literis certe elaboravi.* Who is the speaker? To what does he allude? [2.]

B.

Translate:—

Fructus autem . . . repugnante natura.—C. M. [6.]

1. Parse:—*ante, fiunt, emori, natura.* [4.]

2. *contingit adolescentibus.* Distinguish from *accidit adolescentibus.* [1.]

3. *Omnia autem.* Mention two other post-positive words. [1.]

Translate:—

Nec vero . . . quam somnum.—C. M. [12.]

4. *si efficerent.* Why is the subjunctive used here? [2.]

5. *quo . . . teneremus.* When is "quo" used to denote purpose? [1.]

6. *Mihi . . . persuaderi potuit.* State the rule for the construction. [2.]

7. *admixture.* Why in the ablative? [1.]

8. *cepisset.* When is the deponent form used? [1.]

9. *morti simile.* Distinguish from *mortis simile.* [1.]

10. Give an epitome of the arguments for *Old Age.* [10.]

C.

Translate:—

Juppiter angusta . . . vetusta manus.—*Fasti.* [15.]

1. Parse:—*Capitolia, capiti, modo, opum, quibus,* [5.]

2. *Fura dabat.* Distinguish from *jus dabat.* [1.]

3. *alimenta.* What other case might have been used? [1.]

4. *plus sitiuntur aquae.* Supply the ellipsis. [1.]

5. Give the derivation of:—*Juppiter, vertice, fictile.* [3.]

6. Scan the seventh couplet of the extract, giving the name of each line and marking the quantity of each syllable. [4.]

7. Express in Latin:—*May 6th, Sept. 24th, Dec. 3rd.* [6.]

8. Give *Ovid's* name in full. Where and when was he born. [2.]

LATIN GRAMMAR AND COMPOSITION.

1. Give the gender and the genitive singular of:—*sermo, senectus, sensus, senex, nix, cupido.* [3.]

2. Mention any peculiarities in the declension of:—*sol, meus, artus, filius, nemo, sitis.* [3.]

3. Give the other degrees of comparison of:—*gravius, frugalior, vitiosius, similis, junior, audax.* [3.]

4. Give the principal parts of:—*ardeo, mordeo, jubeo, cingo, mico, divido, cupio, vendo.* [4.]

5. Write the results of the following combinations:—*a* with *fugio, condo, jacio*; *do* with *habeo, ago*; *ad* with *habeo, ago*; *ob* with *facio*; *inter* with *lego*; *bellum* with *gero.* [4.]

6. Give two adverbial derivatives from each of the following:—*hic, is, ille.* *Hic, iste, and ille* are said to be demonstratives of the first, second, and third persons respectively; explain and exemplify what is meant. [6.]

7. Give two examples, with explanations, of each of the following:—words differing in meaning according to number, words admitting of two constructions, words whose meaning is distinguished by the quantity of the penult. [6.]

8. Express in *oratio obliqua*:—

Etenim (inquit) quum complexor animo, reperio quatuor causas, cur senectus misera videatur: unam quod avocet a rebus gerendis . . . Earum, si placet, causarum, quanta quamque sit justa unaquaeque videamus. [7.]

9. Turn into Latin:—

(a) For a Roman, he was quite learned. [3.]

(b) And, indeed, even youth often meets with those things that it does not wish (to meet with). [5.]

(c) When he was seventy years old, he used-to-put-up-with poverty and old age in-such-a-way, that they almost seemed to be a source of pleasure to him. [7.]

(d) Whilst these things were being done, Titurius reached the territories of the Unelli with the troops that he had received from Cæsar. [7.]

(e) Cæsar sent a messenger to his lieutenant to enquire (percontor) why the reserves (subsidiium) had not yet advanced, as they had been ordered (impero). [8.]

(f) What difference does it make to me, whether his deeds be good or evil? [5.]

(g) Your friends say that you are not the same as you used to be. [4.]

MODERN LANGUAGES.

Editors: { H. I. STRANG, B.A., Goderich.
W. H. FRASER, B.A., Toronto.

EXERCISES IN ENGLISH.

1. In the lesson, "The Skater and the Wolves," substitute equivalent expressions for the following.

(a) I had much leisure to devote to the sports.

(b) To the lovers of this pastime.

(c) With the intention of skating.

(d) Fir and hemlock of a century's growth.

(e) The swallow could scarcely have excelled me in flight.

(f) Render them objects of dread to every benighted traveller.

(g) There was no time for thought.

(h) An involuntary motion on my part.

(i) Told me I was still their fugitive.

(j) Every nerve and muscle in my frame was stretched to the utmost tension.

2. In the same lesson, explain the force of the italicized words.

(a) *Glide* away up the *glittering* river, and *wind* each mazy *streamlet* that flowed beneath its *fetters* on toward the *parent* ocean.

(b) A *peerless* moon *rode* through an occasional *steepy* cloud.

(c) Like a *jewelled* zone.

3. Change the following simple sentences to compound ones.

(a) He started for home, promising to return the next day.

(b) The trees met overhead, forming an archway.

(c) Taking off my skates I wended my way to the house.

(d) Not having expected them so soon we were unprepared to receive them.

(e) In consequence of an accident to one of the horses, they were unable to reach their destination before night.

4. Change the following complex sentences to simple ones.

(a) I looked around me for some means by which I might make my escape.

(b) I forgot to notify him that the goods had arrived.

(c) If you had not helped us we should never have succeeded.

(d) When he was informed that the enemy were approaching he ordered the gates to be closed.

(e) He fired his gun in the hope that the report might attract the attention of some men who were working in the meadow which adjoined the swamp.

5. Change the voice of the verbs in the following.

(a) Our toils were forgotten for the time.

(b) My feelings may be better imagined than described.

(c) No one would ever suppose that you had taken such pains.

(d) The ingenuity which they display can hardly be surpassed.

(e) They erected a pillar to remind them of the services which he had rendered them.

6. Arrange the following in as many ways as possible, without spoiling the sense.

(a) I left my friend's house one evening, just before dark.

(b) Never more, on sea or shore, should Sir Humphrey see the light.

7. Change the following to the *indirect* form of narrative.

The king, seeing their amusement and surprise, said: "I see nothing to laugh at in

the advice of this dervise ; but, on the contrary, so convinced am I of the wisdom of this maxim, that I shall have it written on the walls of my palace, so that it may be ever before me."

8. Rewrite the following in prose, in other words as far as possible.

(a) Yon turfens bench the veteran loved,
Beneath the threshold tree,
For from that spot he could survey
The broad expanse of sea—
That element, where he so long
Had been a rover free !
And lighted up his faded face,
When, drifting in the gale,
He with his telescope could catch,
Far off, a coming sail.

(b) But chiefly of hot Trafalgar
The brave old man would speak ;
And, when he showed his oaken stump
A glow suffused his cheek.

9. (a) The vast forests of this province furnish an almost inexhaustible supply of suitable materials for the construction of vessels of all dimensions, in the plantations of oak and elm, beech and maple, birch, ash, larch, and spruce trees, contained in them.

(b) A *mariner*, whom fate compelled
To make his home *ashore*,
Lived in *yon* cottage on the mount,
With ivy mantled o'er ;
Because he could not breathe beyond
The sound of ocean's roar.

(c) And *by* yon gate
That bars the traveller's road, she often stood,
And when a stranger horseman came, the
latch

Would lift, and in his face *look* wistfully ;
Most happy, if *from* aught *discovered* there
Of tender feeling, *she* might dare repeat
The same sad *question*.

(a) Analyse (a.)

(b) Divide (b) and (c) into clauses, classifying them, and giving the relation of the dependent ones.

(c) Parse underlined words in (b) and (c).

10. Which is correct ?

(1) I am afraid we will (shall) be too late to see it.

(2) She was overcome by (with) joy at the sight.

(c) It looked strange (strangely) to see him in your place.

(d) Forty dollars are (is) too much to pay for it.

(e) Hippotamus or hippopotamus, perspiration or perspiration.

(f) I wish he was (were) here to see it.

11. Indicate as nearly as you can the pronunciation of aspirant, towards, often, rendezvous, memoir, iron, hiccough, docile, drought, draught, heroine, valise, dolorous, sonorous, mirage.

12. Write the following :—

(a) The plural of piano, pailful, mouse-trap, shelf, omnibus, this woman's duty, that girl's scarf.

(b) The corresponding gender forms of lad, duck, emperor, doe, master.

(c) The other forms used in comparing less, ill, lazy, best, curious.

(d) The 3rd singular present and present-perfect indicative active of deny, catch, rise, steal, undergo, drive.

13. Fill the blanks in the following with the proper prepositions :—

(a) This answer is quite different the one he got.

(b) Unfortunately it fell the water.

(c) She will be angry you for neglecting it.

(d) This one seems smaller when compared the other one.

(e) He lived Quebec for several years.

(f) It presented a striking contrast what we had just seen.

14. Give examples of :—

(a) A noun clause, subject of a verb, object of a verb, object of a preposition, predicate nominative, nominative or objective in apposition.

(b) Noun, adjective, and adverbial phrases.

(c) *Much*, *round*, *both*, *since*, *well*, used as different parts of speech.

15. Show by examples what is meant by saying :

(a) A finite verb agrees with its subject in number and person.

(b) Prepositions govern the objective case.

16. Combine the following groups into single sentences :—

(a) Soon afterwards a canoe appeared. In the stern was seated a man. The man was paddling gently. He had an air of serenity

and independence. Only the Indian possesses this air.

(b) The officers thought the advice ridiculous. They smiled at it. They looked at the king. They expected him to be greatly enraged. They expected him to order the man to be arrested.

(c) She did not resign herself to despair. She set about building a dwelling. This was to be for shelter during the winter. She completed it. She took up her abode in it. She did so calmly. She commenced her solitary housekeeping.

16. Correct the following sentences where necessary, giving reasons:—

(a) His prices are lower than any grocer in town.

(b) Not one of these people ever offered to lend their assistance.

(c) The opinions expressed are the author's own, and for which no one else is responsible.

(d) On Sunday morning he preached a sermon to the students, of great power and eloquence.

(e) The mud on the carpets was perfectly awful.

(f) You need not expect to meet with a different reception than they did.

(g) When two vowels come together without elision or contraction it is called Hiatus.

(h) For many years she was a native of the County of Huron.

(i) Hardly had he resumed the chair than the trouble began.

(j) Neither he or Irving have achieved such results as Kean.

(k) Its fervour was as ardent as that of Cromwell's army, which believed in the efficacy of prayer, but took care to keep their powder dry.

(l) He was one of those kind of boys that thought that if any of his companions was able to do anything he could do it too.

EDUCATION DEPARTMENT ONTARIO.

JULY EXAMINATIONS, 1885.

Second Class Teachers.

FRENCH GRAMMAR AND COMPOSITION.

1. Give the feminine singular of:—*pécheur*, *chanteurs*, *empereur*, *bénignes*, *majeur*, *grec*. [3.]

2. Compare the adverbs corresponding to:—*bon*, *mauvais*, *petit*. [3.]

3. Illustrate the two ways of forming the superlative relative of adjectives. [2.]

4. Write the third person singular of the present indicative and of the imperfect subjunctive of:—*prendre*, *plaire*, *dire*, *venir*, *devoir*, *suffire*, *faire*, *ouvrir*, *accomplir*, *atteindre*. [10.]

5. Make a list of five French nouns that differ in meaning according to gender, and state the distinctions. [5.]

6. State rules for the pluralization of compound nouns formed of:—(a) two nouns joined by a preposition, (b) an adjective and a noun, (c) two nouns placed together.

Pluralize:—*une grand'mère*, *un coq-à-l'an*, *un essuie-mains*. [6.]

7. Translate into French:—

(a) Have you any wine in your glass? No, I have none in it. [4.]

(b) Who is at the door? Aunt Jane, my uncle John's wife. [4.]

(c) Is your sister in town? No, she is in the country with a cousin of mine. [5.]

(d) It was with James the First, that began that series of misfortunes which gave to the house of Stuart the title of unfortunate. [5.]

(e) Open the door and walk in. [3.]

8. Re-write the following sentences, substituting for each pronoun and verb, the corresponding plural form:—

(a) *Je m'y suis bien amusé.*

(b) *Il n'est pas encore venu me voir.*

(c) *Pense-tu que j'y aille?*

(d) *Je ne connais pas ce jeune homme.*

(e) *Pourquoi ne t'es-tu pas promené?* [5.]

9. Translate into French:

I thank you, my dear mamma, for all your kindnesses; but I no longer care for toys (*joujou*); I am going to tell you, since you

bid me (to do) it, what would please me at this moment. There is here an old peasant-woman, very good and very poor. It is true that her grand-daughter is engaged to a rich vine-dresser (vigneron), but as it is the husband that will have the money, it may be that he will not give to the grandmother so much of it as her girl would wish; at least I fear so, and I would like the old lady not to want anything. [20.]

FRENCH AUTHOR.

Candidates for III. take A and B. Candidates for II. take B and C.

A.

1. Translate:—
Hoche donna . . . coup de grâce des tyrans.—*Lazare Hoche*. [25.]

2. Parse:—*écrit, veuillez, en (si j'en), j'enverrais, batte*. [5.]

3. *tiennent*. Write this tense in full. [2.]

4. *son armée*. Why not "sa?" [1.]

5. *l'a excitée*. Account for the concord of the participle. [1.]

6. *le 12 novembre 1793*. Substitute words for the numerals 12 and 1793. Explain *brumaire*. [4.]

7. *des clubs*. What peculiarity in the use of this expression? [1.]

B.

1. Translate:—*Après avoir . . . à vos ordres*.—*Lazare Hoche*. [5.]

2. *fussiez*. What mood and why? [2.]

3. "*Pardon, général, j'ignorais que vous fussiez un gendarme*." What is the character of this speech? What was Hoche's object in making it? [2.]

4. Mention some of the differences between the English and the French use of the indefinite article. [3.]

5. Translate each of the following (a) literally, (b) idiomatically:—

(a) *Hoche demanda qu'il lui fût permis d'écrire*. [2.]

(b) *A peine arrivé il se fait conduire à comité*. [2.]

(c) *Avec laquelle il s'était recontré à la poison*. [2.]

(d) *Je ne puis me plaindre de mes malheurs, puisqu'ils m'ont appris à connaître quel ami j'avais en toi, toi mon libérateur*. [4.]

6. Translate:—*Elle avait été faite . . . avait été préparée*.—*Lazare Hoche*. [5.]

(a) *redoutant*. Write a note on the concord of the pres: part. [2.]

7. Indicate, as clearly as you can, the pronunciation of:—*dix hommes, dix femmes, nous faisons, notre pays, les enfants*. [7.]

C.

1. Translate:—*L'Opposition, . . . des révolutionnaires*.—*Lazare Hoche*. [14.]

2. Write a full note on the position of French adjectives, and illustrate by examples. [5.]

3. *vendémiaire, en l'an IV*. Explain. [2.]

4. *les terroristes et les montagnards*. Explain. [4.]

5. Translate:—*Ce dernier effort . . . son beau-frère*.—*Lazare Hoche*. [5.]

6. Parse *s'endormit, suffoquant, beau-frère*. [3.]

7. *le 19 septembre 1797*. Substitute words for the numerals 19 and 1797. [3.]

ENGLISH LITERATURE.

Examiner—John Seath, B.A.

NOTE.—200 marks constitute a full paper. In valuing the answers, marks will be deducted for bad literary form.

1. State concisely the influences that affected literature about the beginning of the nineteenth century, illustrating your answer by reference to "The Lady of the Lake" and "Rip Van Winkle." [12.]

2. What personal characteristics of the authors appear in "The Lady of the Lake" and "Rip Van Winkle?" Refer to one passage in exemplification of each. [15.]

3. Quote the "Coronach" (Canto III.), or Ellen's "Song" (Canto I.). [10.]

4. "Now, yield thee, or by Him who made . . . Fitz-James arose." [10.]

(a) Ll. 1 and 2. Show that this exclamation is in harmony with Fitz-James's character. Contrast his conduct here with Roderrick's in ll. 17-30. [12.]

(b) Ll. 5-7. Show the appropriateness of each of these similes. [12.]

(c) Develop the meaning of "No maiden's hand," "was planted in his breast," "life's exhausted tide," "Reeled soul and sense, reeled brain and eye." [16.]

(d) Point out in detail how force and vividness have been given to the description in ll. 5-34. [24.]

(e) Write concise elocutionary notes, bringing out as fully as possible the spirit of the passage. [16]

5. Explain the terms "Satire" and "Humour," giving examples from "Rip Van Winkle." [12.]

6. Describe the Rip Van Winkle household. [20.]

7. Times grew worse and worse . . . months after they had taken place.

(a) *A tart—constant use.* Develop the metaphors here. How is this sentence connected in sense with the preceding one? [10.]

(b) *Here they—about nothing.* Point out the artistic excellence of this sentence. [6.]

(c) *But it would—traveller.* Comment on the literary form of this sentence. Give the force of "But," "worth any statesman's money," and "fell." [16.]

(d) Distinguish the meanings of "console" and "comfort," "sages" and "philosophers," "personages" and "characters," "sessions" and "sittings," "rubicund" and "red," and "dapper" and "neat." [12.]

(e) Show, from the derivation, the exact meaning of "designated," "listlessly," and "discussions." [9.]

(f) What English writer is imitated in this passage? Quote the lines Irving had in mind. [10.]

(g) What characteristics of Irving's style are here exemplified? Refer to the illustrations of each. [8.]

8. Write concise critical and explanatory notes on the following passages* :—

But Ellen boldly . . .
Enchantress, fare thee well. [40.]

* In answering this question, the candidate will be expected to explain and comment on the chief difficulties only, and to point out any blemishes and develop any beauties of thought or expression.

ENGLISH GRAMMAR.

Examiner—John Scath. B. A.

1. Describe, in your own words, the function of the pronoun, explaining clearly the meaning of the expression, "used instead of a noun," and applying your description to each of the following :—

I, thou, he, each, this, many. [12.]

2. "Inflections are changes of form which some parts of speech undergo according to differences in their meaning, or differences in the connection in which they are used."

(a) Classify according to the preceding definition all the inflections in the appended sentence. [8.]

(b) Give the name, and a suitable definition, for each inflection so classified. [10.]

(c) State, with reasons, which of these inflections modern English might dispense with. [6.]

Knewest thou that these women's tempers were sorely tried by his excessive talking?

3. Re-write the following statements, making such corrections as you consider necessary, and assigning your reasons therefor :—

(a) *As is used as a relative after such, same, as many, so many, as much, so much.* [6.]

(b) Any set of words expressing the relations of an adverb is called an "adverbial phrase : " as, "it is *all over* with you." [6.]

(c) When two clauses of a sentence joined by a conjunction are connected with a third clause by *than*, this last clause must be adapted in construction to both of the preceding: as, "I will do as much or more work than James," should be "I will do as much work as James or more." [9.]

4. Distinguish the meanings of :—

(a) *He has done the work* and *He has the work done.* [4.]

(b) *What shall you do to-morrow?* and *What will you do to-morrow?* [4.]

(c) *I told him I would not go* and *I told him I should not go.* [4.]

(d) *He knew who should betray him* and *He knew who would betray him.* [4.]

5. Classify and give the syntax of the italicized words in the following :—

(a) To please me, he put on his best coat and looked his best. [6.]

(b) He left me at home *in* poverty, to the surprise of the lord of the manor's family. [9.]

(c) Since my residence here, the fear of being surprised has made him accustomed to come early: he used to come late. [12.]

(d) He is out of breath running this distance. [6.]

6. Write out fully in the prose order each clause in the following, classifying it and giving its relation:—

When in the woods I wonder all alone,
The woods that are my solace and delight,
Which I more covet than a prince's throne,
My toil by day and canopy by night;
(Light heart, light foot, light food, and slumber light,

These lights shall light us to old age's gate,
While monarchs, whom rebellious dreams
affright,

Heavy with fear, death's fearful summons wait;)

Whilst here I wander, pleased to be alone,
Weighing in thought the world's no happiness,

I cannot choose but wonder at its moan,
Since so plain joys the woody life can bless;

Then live who may where honied words prevail,

I with the deer, and with the nightingale ! [24.]

7. (a) Analyze each of the following, giving the force of the root-words, prefixes and suffixes.—

(1) *prolonging, displeasure, suppression.* [3.]

(2) *reflection, prosperous, confidential.* [3.]

(b) Translate into a derivative each of the following:—

(1) *to lead in a wrong direction, to dash often, one who writes for the daily papers.* [3.]

(2) *to make great, a breaking up in different directions, a taking away from.* [3.]

8. Correct any errors in the following, giving in each case your reason:—

(a) The strongest effluvia I ever felt as come from the spot of which I did not know and did not then see. [9.]

(b) Mr. Smith presents his compliments to Mr. Jones, and finds he has a cap which is not mine. So, if you have a cap which isn't his, no doubt they are the ones. [12.]

(c) It was her firm belief that all unhappy marriages dated only from the wife: and that the coldness as well as the independence, and want of the adoring faculty generally in women, were the sole causes of matrimonial disagreement. [12.]

(d) He has now [the management of the institution, and his success or otherwise will show who among them we are to consider responsible for its past record. [6.]

(e) Heaven forbid that I should refuse him and he a gentleman ! [3.]

(f) My intentions are good, but my execution faulty. [3.]

(g) My object in this communication is to express a hope that the members may, each as far as lies in his power, exert their influence to obtain its removal. [4.]

(h) I ne'er before, believe me, fair,
Have ever drawn your mountain air,
Till on the lake's romantic strand,
I found a fay in fairy land. [9.]

HISTORY.

Examiner.—Jas. F. White.

NOTE.—Not more than five questions, of which 7 and 8 must form two, are to be attempted.

1. Sketch the history of England from the withdrawal of the Romans to the landing of the Conqueror, having regard especially to the geographical distribution and civilizing influences of the different races that occupied the country during that period. [20.]

2. Give an account of the relations that existed between England and Scotland during the Stuart rule. [20.]

3. What causes led to the passing of the Act of the Union? What were its principal terms and what its effects? [20.]

4. Write a concise account of the Wars of the Roses, showing their effect upon the liberty and social life of England. [20.]

5. Relate the important events of the reign of William III. Give an estimate of his personal character. [20.]

6. Discuss the views of government held by the Tudors and Stuarts respectively.

How did the circumstances of the time

affect their endeavours to put these views into practice? [20.]

7. Describe the circumstances under which the several Provinces of the Confederation were settled. [20.]

8. Sketch the constitutional growth of Canada. [20.]

GEOGRAPHY.

1. Briefly explain :

(a) Why we have *four* seasons while there are but *two* within the tropics. [4.]

(b) Why some regions, like Sahara, are rainless, while almost constant rains fall in other places, as Guiana. [4.]

(c) How the latitude of a place is determined. [4.]

2. Write a paper upon the various Territories of Canada, describing their position, extent, physical features, climate, resources, and settlement. [15.]

3. Sketch the southern coast of Europe, marking the adjacent islands, gulfs or bays, straits, river mouths, and principal cities. [20.]

4. Name the British possessions in Africa, giving the position, products, and chief physical features of each. [13.]

5. "On the configuration of the coast-line depends much that relates to the climate as well as to the industry and commerce of a country." Show this dependence as fully as possible and illustrate by reference to different countries. [20.]

6. Choose *one* of the following countries and sketch its physical features; tell what races inhabit it, what languages are spoken, what its productions and industries are; and give an account of its political and social condition:—Egypt, Mexico, Germany, Brazil, Persia.

NATURAL SCIENCE.

H. B. SPOTTON, M.A., Barrie, Editor.

MOUNTAIN TEMPERATURES AT THE EQUATOR.—At the meeting of the Royal Geographical Society on Monday week, Mr. Johnston gave an interesting account of his visit to Kilimanjaro, the great mountain of Eastern Equatorial Africa. The cultivated

zone he found ceased at an altitude of about 5,500ft., when he entered a healthy district with pleasant grassy knolls and many streams of running water, camping beside a lovely fern-choked brook at an elevation of 6,500ft. Stunted forests succeeded, the trees being hung with ferns and creepers. A spot about four miles from Kimawenzi was selected for a settlement, and there his men erected some huts, and surrounded them with a stout fence. The altitude of this spot is about 10,000ft., and the huts were necessary to protect the men from the cold, the thermometer falling below freezing point every night. Provisions were brought in by the natives in abundance and cheap, and Mr. Johnston was able to enjoy delicious beef-steaks at an altitude of 11,000ft. The region of vegetation continues to about 15,000ft., but after that there are stones and snow, with a cold driving mist which wets to the skin—at least when Mr. Johnston reached his highest point—viz., 16,315ft.

ENGLAND has 65 square miles of colony to the square mile of her own area; Holland, 54; Portugal, 20; Denmark, 6.30; France, 1.90; Spain, 0.86 square miles. The area of the British colonies is nearly 8,000,000 of square miles—rather less than the area of the Russian Empire, including Siberia and Central Asia; but if the area of the native feudatory states in India, amounting to 509,284 square miles, be added, over which England exercises as great control as Russia does over much of the territory under its sway, together with that of the United Kingdom itself, 120,757 miles, then the area of the British Empire exceeds that of the Russian Empire by about 200,000 square miles, and it covers within a fraction of one-sixth of the whole land area of the globe.

TEMPERATURE OF THE GULF STREAM IN 1884.—In the remarks appended to the Daily Weather Report of the Meteorological Office for September 26th is an interesting note on the unusually high temperature of the Gulf Stream during the past summer. A comparison has been made in the Office

between returns from twenty-eight ships containing 116 recent observations, with the data in the charts of the Atlantic sea-surface temperature (lately published by the Office) referring to the area between latitudes 45° and 55° N., and longitudes 0° to 35° W., *i.e.*, between the latitudes of the North of Ireland and Bordeaux, and extending half-way across the Atlantic; and it appears from this comparison that during last summer the ocean temperature in the course of the Gulf Stream has been abnormally high. In June the whole area was about 3° Fahr. above the mean; in July the half of the area lying nearest to the British Isles was about $1\frac{1}{2}^{\circ}$, and in August about 1° higher than the mean.

EDUCATION DEPARTMENT,
ONTARIO.

JULY EXAMINATIONS, 1885.

Second Class Teachers.

CHEMISTRY.

Examiner—John Seath, B.A.

1. Describe experiments to illustrate the general properties of acids, bases and salts. Classify, if possible, the following under these heads, assigning your reason in each case:— H_2S , KHO , CO_2 , $CaCO_3$, H_2CO_3 , CaO . [12.]

2. Describe and explain fully one process by which you would disinfect a badly smelling drain. [6.]

3. State in each case the simplest mode of determining when a receiver is full, in the preparation of ammonia, chlorine, carbon dioxide, and sulphur dioxide. How would you transfer each of these gases from one receiver to another? [8.]

4. Describe experiments to show the nature and properties of sulphur. How much air is needed to burn completely 4 oz. of sulphur? [12.]

5. Fully describe and explain the following experiments:—

(a) Some strong sulphuric acid is poured on a piece of zinc, and after the chemical action has ceased, water is carefully added. [4.]

(b) Carbon dioxide is passed for some time through lime-water. A portion of the clear solution thus obtained is boiled; another portion or it is exposed for an hour or so to the air; and, to another portion, lime-water is added. [9.]

(c) Some distilled water is shaken up in each of the full receivers mentioned in 3 above. [8.]

(d) Some chlorine gas is exposed to the air in an open receiver. [5.]

(e) One volume of hydrogen is mixed with one volume and a half of chlorine, and the mixture exposed to the action of diffused sunlight. [3.]

6. You are given a powder known to be carbonate of ammonia, phosphate of soda, nitrate of lead, or chlorate of potash. Describe the simplest mode of determining which it is. [8.]

THE CLASS-ROOM.

DAVID BOYLE, Editor, Toronto.

NUMBER AND ARITHMETIC.—II.

FROM FOUR TO FIVE.—ONE number should be thoroughly taught before another is introduced. Teach four thoroughly, before attempting to teach five. Introduce the new number as a refreshing subject for discovery and learning. The power and skill with which pupils take up the new number is the best possible test of the way the preceding numbers have been learned. They will bring to the new work all the knowledge, power and eagerness to discover what they have already acquired. We see with all we have seen; we think with all we have thought; and we do with all we have done.

ONE is united with four and the name given, five. Find all the fives you can. Draw a figure with five straight lines. Find a block with five sides or faces. Fix five as a whole in your pupils' minds and then begin the discovery of all facts in five. It may be right to ask for the facts in five without the presence of objects. I should try it, and if the result be satisfactory, continue it. At

any rate I should test pupils continually in regard to what they can do with numbers without the presence of objects.

PUPILS with objects before them discover all they can in five. The less the teacher says the better. When pupils have discovered all they can without any help from the teacher, questions may be used. Teacher—Show me four. Show me five. Show me four and one. How many have you? How many fours? How many more than four? How many threes have you? How many more than one three? How many twos? How many ones? How many twos in four? How many threes in five? How many fours in five? What is one half of five? Pupils

will soon discover that they cannot separate five into two equal integral parts. The question is, can they discover that one half of five is two and a-half? Try it. Teacher.—Tell me all the things you can do with five. Let each pupil show the facts with objects, and then tell the facts without objects. Teacher—Show me how many ways you can make five with two numbers? Show me into how many different numbers you can separate five? This latter direction is very awkward, and pupils may not understand. Will some teacher ask it better? Give pupils a great many practical problems in solving the facts in five. Have them make problems.

(To be continued.)

CONTEMPORARY LITERATURE.

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