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THE CANADA
EDUCATIONAL MONTHLY
AND SCHOOL MAGAZINE.

JULY-AUGUST, 1885.

ADDRESS OF CHANCELLOR NELLES AT VICTORIA UNIVERSITY CONVOCATION, COBOURG, MAY, 1885.

(Revised for THE MONTHLY.)

GENTLEMEN OF THE SENATE AND MEMBERS OF CONVOCATION :—

THERE is always some difficulty in discussing educational questions from the fact that, while few persons study them, every one seems to think that he knows all about them. I notice in our country to-day three or four currents of sentiment, each of which appears to me to set in the wrong direction. First, there is the unhappy notion of those who disparage the advantages of higher learning, and who as a natural consequence are hostile, or at least apathetic, in regard to all appeals for the necessary funds, whether those appeals be made to the Legislature or to private individuals. There is, secondly, the opinion of some ill-informed people who imagine that a university can be adequately sustained upon twenty-five or thirty thousand dollars a year, and with such an endowment can successfully compete with neighbouring universities having a yearly income of five or six

times that amount. Sometimes the difference in endowment is supposed to be made up by ecclesiastical influences—influences desirable enough when they secure to a seat of learning the resources requisite for efficiency, but not very desirable otherwise. Thirdly, there is the mistake of those who would give higher education an unduly practical turn, or what they erroneously consider to be practical, throwing out of doors, or at least far into the background, the ancient languages and literature, with those higher philosophical inquiries, in which the ancients were the pioneers, and are still indispensable guides. And there is lastly the error of those who, either as a matter of preference or of expediency, would restrict the work of our national university to what are called secular studies, leaving all religious teaching and discipline to the pulpit and the Sunday-school.

I shall not now discuss these several views in detail, but the tenor of my

remarks will sufficiently indicate my own opinion, both on the general questions, and on some particular educational measures which are now before the country. I wish, however, to remark at the outset that the great matter with me is neither federation of colleges, nor removal of Victoria College from the town of Cobourg, but a satisfactory system of higher education for the Province of Ontario, and an honourable and effective relation to that system on the part of the Methodist Church. I desire, for my part, to rise, as far as possible, above both local and sectarian considerations, and to keep in view the great underlying principles which governed our fathers in establishing this seminary of learning, principles of a very broad and patriotic character, and which are even more sacred and enduring than either Cobourg and Kingston limestone, or the inviting grounds of a Toronto park.

"At the revival of learning," as some one has said, "Greece arose from the grave with the New Testament in her hands." This picture of Greece with the New Testament in her hands, may be taken, by an enlarged interpretation, as an appropriate symbol of a true university. Greece—that is, science, literature, philosophy, and art; in a word, all human culture on its secular side. The New Testament—that is, the Christian religion; human development and perfection on its spiritual or divine side. Both taken together are essential to a well-rounded type of education, as both are essential to individual and national welfare. It is one of the glories of Christianity that it can stand unabashed and unshaken in the presence of all forms of scholarly research, and make them all tributary to its progress; and it is one of the great facts in the history of the universities that they have always recognized Christianity as an indispensable factor in the

work of education. But the Christian Church has at length so divided itself into sections, and on the other hand, the subjects of university teaching have so multiplied and extended, that the relation of the Church to the university has become a difficult problem to solve.

In the Dominion of Canada, and especially in this Province of Ontario, we have long had a perpetual and embarrassing conflict on this great matter. Every sect cannot have a genuine university, and the Legislature cannot recognize the claims of one sect over another. And thus between the necessities of the State University, and the rival necessities of a number of denominational universities, we have at last reached what may be called a kind of dead-lock in our educational progress.

We may, therefore, well begin to inquire, and the growing spirit of Christian union enables us to inquire with hopefulness, whether all the Churches of Ontario cannot combine in one national university, and with advantage to the common interests of science and religion. Those who distrust or oppose such a measure seem to me to raise imaginary obstacles, and also to fail in estimating the increasing extent of university work, and the consequent necessity of large endowments, such endowments as we can only secure in this Province by concentrating all our available resources. Such persons seem to forget that, if we keep our universities poor, we shall have poor universities in more senses than one. They also forget that in so far as any religious body stands aloof from the national system of education it not only deprives itself of advantages to which it is fairly entitled, but does what it can both to weaken and unchristianize that system. "Let us beware," says Mr. Gladstone, "of a Christianity of isolation."

The extension of university work arises chiefly from the progress of the physical sciences; but we have to remember that the newer sciences, or departments of science, have not rendered obsolete or useless the old academic studies, although they have deprived the latter of the monopoly which they once enjoyed. We have to provide for the ancient as well as the modern. Even the old classical and metaphysical departments are far from being stationary, but involve both new lines and new methods of research. I have no need to set up any special defence of classical studies as against modern science and literature. There is no proper opposition between the two forms of discipline, and no occasion for exalting the one at the expense of the other; but when the popular sentiment runs strongly in one direction, as it now appears to do, it is perhaps as well for us to insist a little more on that which is in danger of being unduly displaced. We may, indeed, value too highly the study of ancient literature, but we may also over-estimate, or mistakenly estimate, the value of physical science. True culture is not one-sided, but many-sided, consisting, as Butler says of human nature, "not of some one thing alone, but of many other things besides." The popular current of to-day will, in all probability, soon go rebounding in the opposite direction, according to that salutary law of action and reaction which governs the river of human progress, as well as other flowing streams. And when men tell us that it is better to study nature than literature, as the works of God are nobler than the works of man, we can but use the decisive argument which I once heard employed by Prof. Goldwin Smith, and say in reply, that man is also one of the works of God, and the highest one known to us, and that the study of man requires the study of his language and literature,

and among others, the language and literature of Greece. It is noteworthy to find the following language used by Todhunter, whose specialty is not Greek but mathematics:—"A decline in the state of Greek scholarship implies more than the failure of esteem for the most valuable and influential of all languages; it involves with it a gradual but certain decay of general culture, the sacrifice of learning to science, the neglect of the history of man and of thought for the sake of facts relating to the external world." We may, indeed, deny that Greece fully represents the varied wealth of modern learning, but we cannot deny that Greece gave the first great impulse out of which all modern culture has sprung, and beyond which, in some forms of excellence, no advancement has since been made. "Earth," says Emerson, "still wears the Parthenon as the best gem upon her zone." For many minds of the highest order Homeric studies and Homeric inspiration have lost none of their interest and power. All philosophy, according to a great modern metaphysician, is but Plato rightly interpreted, and the most eminent French moralist of our day announces himself as the disciple and expounder of Aristotle. What is good in these ancient writings agrees with the Gospel, and therefore confirms it; what is false or defective shows the need of the Gospel, and therefore confirms it in another way. The spirit of the olden time, whether from the plains of Marathon or the halls of the Academy, still runs through the generations of men and "enriches the blood of the world." There is no break, and, except by a return of barbarism, there can be none, in the continuity of the world's intellectual life. Men may come and men may go, but this goes on forever. The stream, as it sweeps down the ages, may receive new contributions, but it

will never forget or lose sympathy with the primal waters upon the far-off mountain side. More and more, and in all departments of learning, men are employing the historical method as an instrument of progress, running backward that they may the better leap forward. Not satisfied with the ordinary records of history, they are turning with growing interest to the obscure relics of pre-historic times, the ruins of ancient cities, and the customs and traditions of savage tribes, seeking everywhere to find the human footprints on the sands of time—now in the wilds of America, now in the dark continent of Africa, and now “where the gorgeous East showers on her kings barbaric pearl and gold.”

The history of thought, not less than other forms of history, still returns upon us, again and again, under new points of view, and with larger revelations; but the history of thought proper begins with Greece, and it can no more dis sever itself from that mother-wit of all the schools, than the child can cease to feel the hereditary bias of natural parentage. Back to Kant is the urgent cry lately set up among modern metaphysicians; back to Plato is a cry equally urgent; if indeed it has ever been possible to get wholly away from either the one or the other. Nor is it merely with a view to what some would call barren speculation that men counsel thus, for our eminent and orthodox theologians use the same language. It is in the interests of religion that Prof. Flint and others speak, when they tell us to seek in Plato an antidote against this modern monstrosity of pessimism, that most melancholy of all phases of human thought.

“ . . . Whose cogitations sink as low
As, through the abysses of a joyless heart,
The heaviest plummet of despair can go.”

By a diligent study of these grand old masters, with their enduring “majesties

of light,” we are enabled to counterpoise a narrow materialistic empiricism, which, in an age like ours, inclines to a kind of usurpation in the kingdom of knowledge. The discoveries of natural science seem to reach the masses sooner, and more beneficially, than philosophic speculations; but, sooner or later, they both alike travel down into the hearts and homes of the people, interpenetrating each other for good, and sometimes, as in our day, contending in their encounter for the mastery, like the fresh waters and salt, where a great river meets the rising tide of the sea. All honour to the teachers of physical science who are doing such wonderful things for the promotion of human comfort, and for what Bacon terms “the relief of man’s estate;” but equal honour to those interpreters of the spiritual order, who reveal to us the eternal realities behind the shadows of time; who teach us to remember that man does not live by bread alone, and that Lazarus in his rags feeding upon crumbs may be nearer to God than Dives in his palace, though clothed in fine linen and faring sumptuously every day. But regard for the old system of academic drill can blind our eyes to the fact that the educational problem and university work have undergone an immense transformation. The physical and so-called practical sciences have come to the front with multiplied claims and attractions that cannot be resisted and should not be resisted. They combine with those historical researches to which I have already referred; they give new and fruitful lessons in the laws of health, the origin, the prevention, and the cure of disease, including many ills of a moral kind; they seek to remould the institutions of society; they assert themselves effectively in the several provinces of moral and religious truth; they throw floods of light, and some very per-

plexing cross-lights, upon the works and ways of God; and they have become a necessary study, if not for all Christian ministers, most certainly for all Christian Churches, and especially for those Christian scholars who are called upon to vindicate the claims of our holy religion. Every university worthy of the name must not only furnish instruction in what is known of these sciences, but should, if possible, make provision for original investigations. And beyond all these, we must add such subjects as comparative philology and comparative religion, together with the study of what Macaulay calls the most splendid and the most durable of the many glories of England, our own magnificent English literature, now taking a new and well-deserved position in the curriculum of every university.

Thus, then, between the ancient learning and the modern learning, the physical sciences and the moral sciences, with the innumerable subdivisions of these, and with other forms of inquiry seeking to determine and reconcile the relations of these provinces to each other, the range of university work widens and stretches out towards illimitable fields of study. The ever-enlarging proportions of the modern university call for funds and appliances commensurate with the variety and extent of the work to be done. It may be said that young men at college do not need to cover all this wide field of study, and are in fact not able to do so. This fact rather increases than lessens the difficulty, for it necessitates many special courses of study, and therefore an increased number of teachers, together with a greater variety of buildings, libraries, collections, and other appliances. We may hold different views as to the wisdom of so much specialization, and of making room for such a range of elective and optional work, but the necessity is

forced upon us. We cannot prevent the growth of science and literature, even if we would; and as no student can master all subjects within an undergraduate—or even a post-graduate—curriculum, we are compelled to allow a division of labour. In the days of Methuselah it could have been different. Then men lived a thousand years, and had ample time to cover a full symmetrical course of all known forms of learning. Four years could then have been given to the ancient languages, four to the modern languages, four to the natural sciences, and four to metaphysics, and so on for about fifty years of college life, and a graduate, even at that age, would have counted for a boy. But there is no possible mathematical formula for crowding our modern encyclopædia into the contracted space of a post-diluvian curriculum. And so we must elect and specialize, as the fashion now is, and try not to know everything, but some few things well. I can remember when a Canadian university could venture to issue its calendar with an announcement of a single professor for all the natural sciences, and with a laboratory something similar to an ordinary blacksmith shop, where the professor was his own assistant, and compelled to blow not only his own bellows, but his own trumpet as well. We can hardly be expected to go on in that style now. In a single line of special research a man like Franklin or Faraday may achieve wonders with very scanty appliances, but no man can do that in a college course, where he has to give full lectures to large classes in half-a-dozen distinct departments of science.

The obvious facts of the case, and even the very word university, seem to rebuke us for the appropriation of the name to anything else than a place where all sound means of discipline can be employed, and all

forms of knowledge cultivated, with the best facilities of the age. Such a university we need for the Province of Ontario, and assuredly it cannot be said that we have such a university now. There is not one of those now in existence, not even the Provincial University, that is not complaining sorely, and with good reason, of the want of adequate resources, and the case is rendered the more embarrassing from the fact that, at a distance of a few hours' travel, the well endowed universities of a foreign country present every attraction to draw away Canadian youth. Meantime the several universities which we have are so related to each other, and have inherited such a stubborn old quarrel between opposing systems, that, instead of working as allies, they are rather playing a game of reciprocal obstruction and enfeeblement. The evil has reached a point where it must be met, and the most feasible mode of meeting it is by some plan of consolidation, such as would secure for the country a stronger and worthier university than is possible under the present order of things. Due regard should be paid, and I trust will be paid, by our Legislature to all existing interests, and to the reasonable plea of those who contend for variety, for competition, and for religious instruction, in the work of education. Nor should we forget the immense debt of gratitude due to those religious bodies which provided in earlier days, and which still provide, a liberal education for the youth of the country. But if, with proper consideration for these things, and without doing violence to the great principles on which Victoria College was founded, we can aid in building up a proper national university, and can even help to supply some elements in which we have felt the University of Toronto to be deficient, and can moreover give the Methodist people the full advantages of this improved

constitution, then I maintain that no sectarian divisions, no undue regard for local interests, no sentimental attachment to an old order of things for which the occasion has largely passed away—none of these things should induce us to block the way to a great public good by opposing in the Legislature the improvement of a national institution which we profess to uphold, and which, in a new country like ours, will at the very best fall short of the true ideal.

Repeatedly during the past thirty years the authorities of Victoria University and of the Methodist Church have laboured to bring about some form of university federation, but thus far without success. The present scheme has valuable features not embraced in any former plan, and seems to open the way, so far at least as Victoria is concerned, to a satisfactory settlement of this long-continued and injurious controversy. If I thought the scheme would be in any degree unfavourable to the great ends for which Victoria University was founded, then I for one would have nothing to do with the measure. But, as accepted by our Board of Regents on the 9th of January last, I find all reasonable security both for intellectual advantages and religious influences, with even greatly enlarged facilities, for both the one and the other. The intellectual advantages are obvious enough, but as regards the religious advantages it must be evident to those who look carefully at the matter that it affords an opportunity for supplying to our national university that religious teaching and influence on which the Church colleges have always laid so much stress, and the want of which they have deplored in Toronto University. I do not think that the Senate or the Executive officers of the Provincial University can be justly blamed for the secular character of that institution. They have done

what they could consistently with the constitution imposed upon them by the Legislature. But now that the Senate and the Government propose to widen the basis by this scheme of federation, and to give the denominational colleges scope for adding religious subjects to the curriculum, with collegiate homes and discipline for the students, then if we have been honest in our former contention, why should we not rejoice at this liberal and Christian reconstruction of our Provincial University?

I have not agreed, and I do not now agree, with those who think that the higher education of the country should be purely secular. I plead for a national university, but such a university for a Christian people should somehow employ, both in its lecture-rooms and in the personal character of its professors, the highest and most effective of all spiritual forces known among men—the power of the Christian faith; otherwise, with all her cold intellectualism, she will stand, like Niobe of old, through her irreverence and despair, at last hardened into stone, and holding, not indeed the New Testament, but “an empty urn within her withered hands.” It is a profound and eminently Christian saying of Dean Stanley’s, that all high order of thought seeks to unite the secular learning and the sacred, while all thought of a low order seeks to separate them. Never was it more necessary than in our day to bear this great truth in mind, and to apply it in our national system of education. We have been struggling hard, and with only partial success, to keep the

religious element in our public schools. Under the present Administration some further steps have been taken in the right direction. And now the federation of colleges affords an opportunity for the Churches to join hands in giving a more positive Christian character to our higher education, and apparently in the only way in which it can be fully done. Why should we let the opportunity pass? If we had no Provincial University, and the denominational colleges had university teaching, as a whole, in their own hands, the case would be greatly altered. But it is evident that a large part, and perhaps an increasingly large part, of this academic work is to be done by the Provincial University, and the question is whether the Methodist Church will do her share in the work, or prefer an isolated and less influential position. I have tried to forecast the disastrous results to the Methodist Church which some of our friends prophesy from this scheme, and when I have summed them all up, and at the very worst, I can only find the following:—First, improved intellectual advantages for all the youth of the country, including of course, the youth of the Methodist Church; secondly, the same religious safeguards which we possess at present; thirdly, a wider range of religious influence; fourthly, increased facilities for the theological training of our ministers; and lastly, all of these with a smaller, or at least a more productive, outlay of money on the part of our Church than is possible under any other arrangement.

KOSMOS puts the total length of all the submarine cables at present laid at 68,352 miles, or nearly three times the circumference of the globe. Each cable consists of forty

wires, so that the total length of iron and copper wire used amounts to twenty-five millions of miles, or ten times the distance between the earth and the moon.

"UNION IS STRENGTH."

DAVID BOYLE, TORONTO.

IT is not improbable that most readers of THE MONTHLY have, more than once, stumbled over the old saw that forms the title of this article; it is even quite likely that they have expatiated before their classes on the beauty of the moral truth which is thus tersely expressed. On all sides we find apposite examples of its application. In politics, in matters relating to churches, to ministers, to physicians, to lawyers, and to labour generally, there is union, a union too which very materially affects the welfare of those who form the "charmed circles." But of all persons in this Province who most require union, *i.e.*, whose interests might be most beneficially affected thereby, it is nearly a certainty that teachers stand in the front rank. To those of the profession who hold situations in populous centres, this may not seem to strike with much force; but from the nature of the case it must ever be that the majority of teachers shall be in rural situations, and for them more especially, although in a large measure for all, it is claimed that fraternal union is calculated to produce good results. The country teacher is, as a rule, isolated from the great bulk of the Province, except in so far as he may be able to form or renew acquaintances at local meetings, or to glean information from the professional journals. There is utterly wanting anything like a bond even among the teachers of a county, to say nothing of the Province. The fact appears to be that the pedagogues of this country are exceedingly unselfish. At meetings of county and provincial associations the whole time

is devoted to purely professional consideration—how to teach this or that; how to maintain discipline; and generally, how best to manage the school in the interests of the pupils and their parents. This is all very well, but it does not amount to bread and butter for the teacher, except in an indirect and exceedingly slow way.

Teachers of to-day are capable of doing fifty per cent. more (and better) work in the school-room than was possible fifteen or twenty years ago; but there has been nothing like a corresponding increase in their remuneration. Scarcely more than ten years ago the *model* (!) form of school return issued annually by the Education Department, supposed a school of sixty pupils taught by a teacher at a salary of \$280! It was only after the writer, and perhaps others also, remonstrated with the Department, that this *model* sum was considerably increased. But will anyone say that salaries paid to-day are anything like so proportionately high as is the teachers' present efficiency compared with that of the last ten, fifteen, or twenty years?

It now costs hundreds of dollars to prepare for a certificate, where formerly a premium was actually paid to successful candidates. The cost of living is greatly in excess of what it was within a comparatively recent period, and teachers now-a-days have to spend more in books and appliances than was formerly necessary, yet salaries are but little higher than they were under the old order.

This condition of things is mainly owing to the action or inaction of teachers themselves. There has been

too much *blind* competition; no common understanding; no organization; no union.

It may be said of our people that they have never felt the cost of common school education. For one rural ratepayer whose assessment amounts to five dollars per annum, there are fifty who pay not more than half of that, and many much less still.

In Great Britain, where the legislative aid per pupil ranges from twice to five times what it is in Ontario, the school-tax is not unfrequently one shilling in the pound. From sixpence to tenpence are common rates, and nobody grumbles—at any rate there is no more discontent than is exhibited in this country when the assessment has been struck at from five to ten mills in the dollar.

With us, the most popular school corporation is that which "runs" the section on the smallest sum of money. A teacher is advertised for at \$200, \$300, or more rarely, \$400 per annum, and forthwith applications pour in, some expressing willingness to teach for even less than is offered. In such circumstances trustees can arrive at but one conclusion, viz.: that the supply being so large, they will, in future, be warranted in offering a still lower salary.

Now, the fact is, that there are not so many idle teachers as there appear to be from the trustees' point of view, for, in all probability, our suppositious applicants have asked for engagements in half-a-dozen or more places at or about the same time, and each applicant being laudably desirous of securing a situation, he unwittingly crowds the others.

This being the case, the question is (and it is that to which this article purposely leads): Can such blind scrambles be in any way avoided? There need be no hesitation in answering, yes; and it will be easy to show that no other body of workers in the

Province have anything like such good facilities for arriving at a definite, reasonable and practicable understanding on the matter of remuneration as lie within the grasp of the teaching fraternity.

Every lot in a given county is assessed, and the value of all the school sections is easily ascertainable. It is chiefly on the basis of assessed value that any estimate can be made relative to the school-supporting ability of a section.

What is suggested is that the Teachers' Association of each county should appoint a committee whose duty it would be to possess itself of all the facts and figures affecting the various school sections, and from these data make a fair estimate of what salary each section might reasonably be expected to pay.

Intending applicants should correspond with the secretary of this committee before communicating with any board in want of a teacher, and would receive from him a statement of any section's "standing," with, perhaps, other information that would enable one intelligently to appreciate "the situation." The secretary might also supply each applicant with a list of the other applicants in time to permit of modification or withdrawal.

For this information small fees would, of course, be chargeable, but nobody would grudge these in view of the prospective advantages.

It does not appear that there is anything utopian or *very* selfish in this proposition. It seems to be simple, and needs but united support to become successful, that is, to enable all to avoid the present cut-throat system which tends only to keep down salaries by enabling parsimonious boards of trustees to profit by the want of organization amongst the fraternity.

That some sort of union or organization is most imperatively necessary,

scarcely any one will deny ; this, after a good deal of thought, is what strikes the writer as one of the simplest and most workable plans that can be adopted.

It will be a pleasure to hear from correspondents on this question.

Let it be discussed at county conventions ; and should discussion lead to action, the time may not be far distant when the union will be Provincial, not local, and nearly, if not quite, inclusive of every live man and woman in the profession.

THE WORLD'S PURIFIERS.

BY THE REV. J. C. WOOD, M.A.

METAPHORICALLY speaking, the beetle has been on its back for many a long year. Let me try to set it on its legs.

Perhaps no insects have been less understood than the beetles. Even Shakespeare, though he could find a compassionate word for the "poor beetle that we tread upon," could not find a kindly or appreciative word for it. On the contrary, he shared the popular belief that beetles are noxious, hateful, and objectionable beings, and baneful to mankind. In the *Tempest*, where Caliban reviles Prospero, he invokes—

"All the charms
Of Sycorax, toads, Beetles, light on you."

In the *Midsummer Night's Dream*, where Titania sleeps, her attendant fairies sing—

"Beetles black, approach not near."

I very much fear that the popular prejudice has not undergone very much change for the better, and that beetles of all kinds are generally detested, even if not actually feared. Yet, even considered as to outward appearance, there are no living creatures which are more graceful of form than many beetles, while many are adorned with colours such as no art of man can distantly imitate. Not even the brilliant plumage of the humming-bird can compare with that of many beetles which to the unaided

eye appear as if they were nothing but dull green or yellow, while the infinite variety of patterns with which their wing-cases are sculptured would make the fortune of a designer. It is true that a few of them are rather offensive to our nostrils, but, by way of compensation, there are quite as many which are gifted with perfumes such as we might only expect from the sweetest flowers.

As to their uses, it is not easy to say what may be the ultimate use of any being whatever, or the influence which it exerts upon the world in general. That each species of beetle must exert some active influence upon the world is evident from the fact that it exists. Had it no work to do, it would be withdrawn from the world, in accordance with the Divine law, which has no toleration for idleness.

I purpose in the following pages to take a few typical examples of the beetle tribe, and to lay before the reader some of the work which they do. I shall not, however, venture to say that they have no other work, or to define the ultimate object of the work which we see, whether it be done in their larval or perfect state of existence.

There can be no doubt, however, that Food is one of the chief agents employed, not only by the beetles, but by all living beings, including man himself, in carrying out the

object of its temporary sojourn upon earth. No insects have so wide a range of food as the beetles and, if for that reason alone, they are deserving of our consideration.

Roughly speaking, we may divide the beetles into carnivorous and vegetarian, and will take them in that order.

Firstly, however, we must be able to define Beetle, or Coleopteron.

All insects have normally four wings, though in some all four wings are rudimentary and left undeveloped. In others, such as the house-flies and gnats, there are apparently only two wings. In fact, however, there are really four, but the hind pair are rudimentary, so that only the two front wings are used for flight. In beetles, however, the hind pair only are used for flight, the front pair being very much thickened, useless for flight, and serving as covers for the hind pair when the insect uses its legs for locomotion.

As to their life-history, it is, in all the main points similar to that of other insects. It begins with the egg, from which is hatched the larva, or grub. In process of time the larva becomes a pupa, which in its turn becomes developed into the perfect insect.

Except in some few instances, where we can keep the creature under our eyes through all its stages, it is very difficult to trace the progress of an individual.

We can easily do so with the butterflies and the generality of moths, the eggs being laid in the open air, and the larva, or caterpillar, feeding upon leaves, so that it can be kept in sight. But most of the beetles pass their existence under very different conditions. As a rule, in the larval state they are darklings, and shun the light to such a degree that if they are compelled to live in the light their natural conditions are altered, and

the insect cannot be expected to thrive.

Some, however, have been watched throughout the whole, or the greater part, of their lives, and I purpose to take our examples almost wholly from them.

Beginning with the carnivorous beetles, we will first take those which feed on living prey, and which in consequence possess a highly organized structure. Externally, as they have to catch their prey in fair chase, they possess active limbs and powerful jaws, many of them being gifted with swift wings. Such are the Tiger Beetles.

Even if he had never heard of such an insect, any student of nature would know from the figure that the beetle must not only be carnivorous, but that it must be in the habit of chasing living and active prey. The firm and graceful outlines of the body and the formation of the legs show that the creature is swift of limb; but even if the rest of the body had been destroyed and nothing left but the head, an entomologist could at once deduce from it the character of the insect to which it belonged.

The enormous and projecting eyes, which occupy a very large portion of the head, denote that a large range of vision is required, while the long, sharp-pointed jaws, the tips crossing each other when closed, so that prey, when once seized, could have no hope of escape, show that the beetle must be rapacious as well as carnivorous.

There are many of these Tiger Beetles (*Cicindela*), as they are appropriately termed, several of which inhabit our country. One of them, the Green Tiger Beetle, is plentiful on most waste ground where the soil is sandy. I well recollect my first acquaintance with this beetle.

I was little more than a boy at the time, and had gone out with an insect

net to the outskirts of Bagley Wood, near Oxford. On a sandy knoll I saw several dull green beetles running about with extraordinary activity, but succeeded in pouncing upon several and putting them in to my tin collecting box. (N.B.—I did not then know the virtues of the “laurel-bottle” as a mode for almost instantaneous destruction of insect life.)

I had also seen plenty of shining blue flies on the wing, but, in my ignorance, I mistook them for blue-bottles, and did not trouble myself about them. Presently, however, one of these flies settled on the sandy knoll, folded its wings, and to my profound astonishment became a beetle, and ran away almost as swiftly as it had flown. Of course I caught as many as I could and betook myself homewards.

I had been all the time conscious of a rather powerful odour somewhat resembling the perfume of sweet-briar leaves, but had no idea that the beetles were in any way connected with it. But when I reached my room and opened the box, the fragrant odour that rushed out of it showed at once that in was exhaled by the beetles.

The potency and permanence of this odour are almost remarkable. I had put a pair of kid gloves in the same pocket which contained the tin collecting box, and though the box was tightly closed the gloves retained the sweet-briar-like perfume for many days.

On setting some of them in the attitude of flight, the instantaneous change of colour, from metallic blue to dull green, was at once explained. The upper surface of the abdomen was shining blue, while the wing cases (*elytra*) were dull green. Consequently, when the insect alighted the wings were folded upon the abdomen, and then covered by the closed *elytra*.

I have used the word “dull green”

to express the colour of the wing cases, because they present that appearance to the unassisted eye. But if the insect be placed beneath the half-inch object glass of a good microscope, and a brilliant light concentrated upon it, the observer is almost dazzled with the brilliancy and variety of the colours which bedeck it.

If a feather from the head or breast of a humming-bird be placed under the microscope, half its gorgeous colours vanish. But with the Tiger Beetle the effect is reversed, for it would be impossible for the keenest human eye even to imagine the jewelled glories of the Tiger Beetle's *elytra*.

The interest of this beetle does not cease with its personal splendour, its activity over the ground or in the air, or, in fact, with its existence in the perfect state. While a larva or grub it is quite as interesting in its way. It is not by any means a pretty larva, and, in fact, is rather an ungainly-looking creature, grey-brown in colour, with six little legs, so feeble that they can hardly drag their owner over the ground, its head armed with two long curved jaws, and having one of its “segments” or rings of the body very much swollen, and furnished with a couple of stout hooks.

Although it does look ungainly on a smooth or even a level surface, it becomes a different being when in its own home. It makes in the ground an almost perpendicular burrow, out of which it never ventures until it assumes the perfect form. Yet, as is evident from the shape of the jaws, it is predacious, and, moreover, requires a large and constant supply of living prey.

How is it to obtain that prey while it is imprisoned in its burrow?

That it should catch its insect prey by fair chase, as it does after it has assumed its perfect form, is manifestly impossible, and it must therefore

possess some other means of appeasing its insatiable hunger. The mode which it adopts is somewhat similar to that which is employed by the ant-lion.

I have already mentioned that the larva of the Tiger Beetle lives in a perpendicular burrow, and that it has a pair of hooks upon an enlarged segment. This segment is the eighth in order, counting the head as one, and its use is very remarkable.

When awaiting prey, the larva ascends the burrow, but keeps the whole of the body within it. The head is laid flat on the ground, and the wide jaws are extended to their utmost. Considerable exertion would be needed in order to retain this position, but the enlarged segment and its hooks now come into play. The segment is so large that it nearly fills the burrow, and the hooks which project from it serve to keep the larva in position. As soon as an unsuspecting insect comes within range of the jaws it is seized, the hooks are unhitched, and the larva drops to the bottom of the burrow, which is sometimes more than a foot in depth.

Ants form a large proportion of the Tiger Beetles' larva food, for they have very imperfect sight, and are apt to blunder against obstacles which they do not know. Mr. Westwood, who kept many of these larvæ, says that when engaged in excavating they carry the earth on their heads.

Next we will take a vast family of predacious beetles which do not require wings to aid them in catching prey, and are therefore called Ground Beetles (*Carabus*). This last word is Greek, signifying either a crab or a hard-shelled beetle, and has been pressed into the service of entomologists in order to designate the beetles belonging to this particular family. Some of the larger species are singularly graceful in outline.

Plentiful as these insects may be,

their life-history is not easily written. The Tiger Beetles give but little trouble, for the simple reason that they are essentially lovers of light and heat, and, like the ants on which they prey, are children of the sun.

But the great *Carabus* family are as a rule darklings, and whether in their perfect or larval condition, do not care to face the sunlight. This is the more wonderful, because their forms are so graceful, and in many cases their colouring is so lovely, and requires so much light for its manifestation, that we, in our ignorance, cannot understand why these beings should shun the light. A parallel example may be found in the marine worm which is called by the very appropriate name of *Aphrodite*.

Its body is clothed with hairs, each of which when the light shines upon it looks like a waving beam of prismatic light, the hues changing with every movement.

Yet, not even the rat-tailed maggot lives so sordid a life. Nothing, to human eyes and nostrils, can be more repulsive than the black mud which settles upon our shores, and which is almost wholly composed of decaying organic matter. Buried under this fetid mud lies the *Aphrodite*, a phenomenon as remarkable as if the most brilliant humming-bird were to inhabit the Mammoth cave, where no ray of light could touch its gorgeous plumage.

Phenomena such as these ought to make us less ready to pronounce judgment on the work of our Creator, and more ready to echo the wisdom of one who dared to acknowledge that these things were too wonderful for him.

There is one member of this group whose work—or, at all events, a part of whose work—is self-evident. This is the beetle which is scientifically known as *Calosoma sycophanta*, but which, on account of its great rarity in this country, has no popular name.

All over the warmer portion of the Continent, however, its value is now acknowledged.

There is on the Continent a moth the larva of which is called the Processionary Caterpillar, on account of the remarkable organization which it possesses. As a rule caterpillars are very independent beings, each one shifting for itself, and not acting in concert with others. But the Processionary Caterpillars have a fashion of marching with a precision which would do honour to the most perfectly drilled troops of modern times. A single caterpillar takes the lead, and the rest follow in "Indian file," the head of one almost touching the tail of its predecessor. On account of their numbers these caterpillars are exceedingly destructive, and would be even more injurious were it not for the Calosoma beetle, which deposits its eggs in the habitation of the Processionary Caterpillar. These latter creatures dwell in a common silken web spun by themselves, and very much resembling the home of the little Ermine moth which is so plentiful in our hedges and fruit trees. No sooner is the Calosoma grub hatched than it begins to eat the caterpillars, and as it is exceedingly

voracious, it makes great havoc among them. So true is the instinct of the mother-beetle that there is scarcely a web of the Processionary caterpillar in which at least one Calosoma cannot be found. Sometimes several of the larvæ of this beetle are to be found in the same Processionary nest, and then they are rather apt to defeat their own objects. They do not seem to possess the least discrimination, but when they come across anything alive and soft they consider themselves bound to eat it. Consequently, it occasionally happens that one Calosoma larva comes upon another, and "strikes it amidships," as a sailor would say. The natural result takes place, and while one Calosoma grub is hunting for Processionary caterpillars, it is being devoured by one of its own brethren. Here again we recognise the forethought of the Creator. The sense of pain, terrible as it is to beings of a higher organization, is so slightly developed, that the Calosoma larva will be so absorbed in devouring a Processionary caterpillar that it does not know that it is itself being eaten by one of its own kinsfolk. Again, these things are too wonderful for us. —*Sunday Magazine.*

LESSON IN PRACTICAL LETTER-WRITING.

BY G. A. GASKELL.

LETTER writing, in its true excellence, can scarcely be regarded as an art. Instruction may, no doubt, be imparted through the medium of rules; but these applicable to the subject are few, and at the same time of the simplest character.

It should always be borne in mind that letter writing is but "speaking by the pen." The first endeavour of a writer should, therefore, be to express

himself as easily and naturally as in conversation, though with more method and conciseness.

1. *Style.*—The style should be determined, in some measure, by the nature of the subject, but in a still greater degree by the relative positions of the writer and the person addressed. On important subjects the composition is expected to be forcible and expressive; on lighter subjects, easy

and vivacious; in condolence, tender and sympathetic; in congratulation, lively and joyous. To superiors, it should be respectful; to inferiors, courteous; to friends, familiar; and to relatives, affectionate. Ease should distinguish familiar letters, written on the common affairs of life, because the mind is usually at ease while they are composed. The dependant writes unnaturally to a superior in the style of familiarity; the suppliant writes unnaturally if he rejects the figures dictated by distress. Conversation admits of every style but the poetic; and what are letters but written conversation.

2. *Arrangement of Ideas.*—The purport of any letter should be well considered before its commencement, not only with a view to the attainment of a thorough clearness of expression, which is of primary importance, but likewise that the principal points to be discussed may be prominently brought forward, while those of a trivial nature are but slightly mentioned. It requires, however, not only a certain amount of tact, but some quickness of perception, to avoid that stiffness and formality which are incident to the arrangement of the subject, and which are great defects in letter writing.

3. *Ornamentation.*—A redundancy of ideas and of language is a common fault with those capable of writing with facility. As a rule, therefore, all striving at effect or attempt at ornamentation should be avoided; and as the chief charm of a letter is its originality, writers should not avail themselves either of hackneyed expressions or of ideas borrowed from others. An exhibition of epistolary talent is far less likely to gratify a correspondent than an easy, free, and faithful expression of the sentiments of the writer; and by thus expressing himself he will also naturally avoid any excess of flattery or exaggerated professions of

regard, so peculiarly objectionable in a letter, and at variance with all delicacy of taste. At the same time, a strict adherence to the natural expression of the thoughts will gradually introduce a degree of ease, fluency, and force which may be carried to a high degree of perfection.

4. *Long Sentences.*—Unpractised persons will, at first, find it desirable to make their sentences as short as possible, that they may have them completely under control. Long sentences, even when well constructed, frequently occasion some degree of obscurity, and are less forcible than short ones. Parentheses, though sometimes necessary, likewise tend to obscure the meaning of the writer, besides weakening the effect of sentences; they should therefore be avoided as much as possible.

5. *Composition.*—As regards the composition of letters, it is generally desirable, except with those upon business matters, to commence with some introductory remarks, not as a mere formality, but for the purpose of conciliating attention to the main subject of communication, which may otherwise strike too abruptly upon the mind of the reader. The introduction should be followed by the development of the topics for discussion, according to the importance attaching to each; and the conclusion should, when occasion requires, be devoted to the confirmation or summing up of what has been previously stated, and to expressions of regard or affection.

6. *Tautology.*—Tautology, or the repetition of the same words, should be guarded against, as forming a blemish of a striking character. In this effort the continual need of words of like meaning will soon render a writer familiar with a variety of synonyms; and the possession of a copious vocabulary will conduce greatly to the general freedom of the composition.

7. *Postscripts.*—Postscripts are generally indicative of thoughtlessness, and should be avoided, except when necessary for the purpose of mentioning some circumstance that has occurred since the letter has been written. To convey any assurance of regard or affection by means of a postscript is a great impropriety, as appearing to imply that the sentiments are so slightly impressed upon the mind of the writer as to be almost forgotten. There are special circumstances, however, which may render an expression of feeling in a postscript even more impressive than in the body of the letter; but such cases are exceptional, and must be left to the judgment of the writer.

8. *Capitals.*—Capitals should be used cautiously in letter writing. We should certainly not confine the writer of a letter to the rigid rule observed in printed literature, because an important word may sometimes be graced with a capital, which, in a printed form, would begin with a small letter, but an indiscriminate or even frequent use of capitals is a proof of the ignorance of the writer. The name of a person should always commence with a capital, and every fresh paragraph should commence with a capital; beyond this there is little need of their use—strictly speaking, none.

9. *Punctuation.*—Proper punctuation is essential to a correct and regular mode of expression. The best general rule to follow is to place the points where a pause should occur in speaking. Dashes should only be used to mark sudden change in sentiment or in place of parentheses. Correct punctuation not only gives elegance to a composition, but it makes its meaning clear, enforces attention to those words or passages which most require it, and to a great extent, prevents a misunderstanding or wilful misconstruction of the writer's meaning.

10. *Repetition.*—Avoid repetitions; they always offend the judicious ear, and are seldom proper, except when they enforce any particular meaning, or explain it more fully.

11. *Date.*—The date is a matter of great importance, particularly in business letters, therefore, you cannot be too careful to state it in full and correctly. Unless you write from a large city, like New York, Brooklyn, Philadelphia, New Orleans, Cincinnati, Boston, or Chicago, you should always mention the State, and generally the county, as there are many post offices of the same name in the United States. If you write from a city, mention the name and the number of the street, or the name of the hotel. With English writers it is customary to put the day before the month in dating a letter, as, 18th of September, instead of September 18th. We deem the former more correct, but custom favours the latter in this country.

12. *How to begin a Letter.*—A letter should be begun about two inches below the top of the paper, and the writer's left hand margin may be about an inch broad. The writer's name should be signed a little distance below the conclusion.

13. *Proper Modes of Address.*—The styles of address are varied to suit the occasion, and the terms of compliment at the close of the letter are always considered as mere courtesy or form; they should not therefore on any occasion be avoided. To a person with whom a writer is not well acquainted, he should say, "Sir," or "Madam," concluding with "Your obedient servant"; to those with whom he is tolerably well acquainted, "Dear Sir," or "Dear Madam," with "Yours faithfully"; and to those with whom he is on more familiar terms, "My dear Sir," or "My dear Madam," with "Yours truly," "Yours very truly," "Yours sincerely," "Yours very sincerely."

14. *The Superscription.*—It is fashionable to write the superscription as near the right hand under angle or corner of the letter as convenient. The name of the place must always be written in a line by itself, and in a large, bold character.

15. *Concluding Hints.*—Never send a *note* to a person who is your superior, unless it be upon a very slight and indifferent matter. In asking a favour of an intimate friend, address him in the first person.

Do not take bad writing for freedom of style. Whatever pleasure your

friends may derive from reading your letters, you have no right to suppose that they have time for the study of *hieroglyphics*.

And, finally, remember that whatever you write is written evidence either of your good sense or your folly, your industry or carelessness, your self-control or impatience. What you have once put into a letter box may cause you lasting regret, or be equally important to your whole future welfare. And for such grave reasons, *think before you write, and think while you are writing.*—*Penman's Journal.*

THE SASKATCHEWAN COUNTRY.

GEORGE M. DAWSON.

THE district at present attracting attention as the scene of an insurrection of Half-breeds and Indians against the Canadian Government is situated on the North Saskatchewan River, near the northern margin of the great plains. The vast region of plain and prairie which occupies the whole central portion of the Continent, crosses the 49th parallel of latitude—which constitutes the international boundary-line—with a width of 750 miles, but extends north of the boundary about 300 miles only, being there limited by the edge of the great northern forest which stretches, with little interruption, to beyond the Arctic Circle. Prairies of considerable size occur, it is true, in the valley of the Peace, but these are isolated from the great plains by wide forests. There is reason to believe that the greater part of the prairie country in Canadian territory might become permanently wooded but for the almost annually recurring prairie fires, which are still tending to increase its area. The southern edge of the forest is, however, in the main, coincident with that of a region of abundant rainfall.

The northern border of the prairie country may be generally defined by a line drawn from the vicinity of the City of Winnipeg westward to the junction of the Assiniboine and Qu'Appelle Rivers; thence north-westward to the junction of the North and South Saskatchewan Rivers; thence westward, nearly following the latter river, to Edmonton; from that point south-westward to Calgary, on the Bow; and thence southward along the eastern base of the Rocky Mountains. The total area thus outlined, which is either altogether treeless or characterized by wide stretches of prairie interspersed with scattered groves of aspen and other trees, is approximately 300,000 square miles. The southern and south-western parts of this region may be described as entirely without wood, though even there the rivers are almost invariably fringed by groves of cottonwood.

The general elevation of the plains of the Canadian North-West is very considerably less than that of the corresponding portion of the Continent farther south, the mean height of the whole region above outlined being

probably less than two thousand feet above the sea-level. The most pronounced inclination, however, giving direction to the rivers of this portion of the great plains, is that from the base of the Rocky Mountains to the east or north-east. The Red River valley, which constitutes the lowest prairie-level, and lies along the base of the eastern Laurentian plateau, has an altitude of about eight hundred feet only. From this level, with minor exceptions, the surface may be regarded as sloping gradually and continuously upward, at a rate of from four to five feet in the mile, to the foot-hills. Here the horizontal and unaltered strata of the cretaceous and Laramie formations break against the base of the ancient rocks of the mountains into a series of sharp and nearly parallel flexures, producing a varied and picturesque region, with quite peculiar characters. In the central portion of the plains, the most marked exceptions to their generally even and monotonous contour are found in the tumultuously hilly belt of country known as the Missouri Côteau and in a line of diffuse and indefinite elevations nearly parallel to the Côteau, which includes Turtle Mountain, Moose Mountain, and the File and Touchwood Hills. These hills, or mountains so called, are really tracts of considerable size, with rolling or hilly surface, more or less wooded. The northern extension of the Côteau, where known as the Eagle Hills, near Battleford, also becomes partly wooded.

To any one familiar with the territory lying west of the Missouri, the most remarkable difference of a general character, observable in this northern extension of the same region, is perhaps the extraordinary abundance of small lakes, ponds, or 'sloughs,' which are scattered everywhere over its surface. This peculiarity is evidently in connection with

the mantle of glacial drift, which is here universal, and dependent on the irregular deposition of its material. The lakes and ponds, while at times arranged in intercommunicating linear series, are usually distributed without the least apparent regularity, and occupy shallow basins without outlet. Filled by the melting of the snow or rains of the early summer, a great proportion are completely emptied by evaporation before the autumn, while the water remaining in others becomes more or less distinctly saline in many instances. This is more particularly the case with those of the southern and more level portion of the region. Near the northern margin of the plains, saline lakes are quite exceptional. It is generally on the edge of one of these rush-bordered pools that the traveller makes his evening camp; and, while the abundance of water in one respect facilitates travel in the spring and early summer, the moist condition of the deep alluvial soil at these seasons may prove a more than countervailing disadvantage. The most serious obstacles, however, to be met with in long journeys across the plains, are the various rivers. The Assiniboine, Souris, Qu'Appelle, and other streams of the eastern district, during the breaking-up of the ice, and for some time subsequently, may prove formidable barriers in the absence of bridges or ferries. The North and South Saskatchewan, the Red Deer, Bow and Belly Rivers, all eventually uniting to pour their waters into the northern end of Lake Winnipeg, rise far back in the Rocky Mountains, and, while subject to considerable spring freshets in some seasons, are generally not in full flood till June or July, when the snow is disappearing from the highest summits of the range, and the snow-field and glaciers about the sources of some of them are melting most rapidly. These streams have trenced valleys

across the surface of the plains, which are generally from a hundred to three hundred feet in depth, and a mile to two miles or more in width. All the trails used as regular means of communication make for recognized crossing-places on these rivers, where the approaches are favourable, and where very generally the river may be forded at low water, though ferries of some kind have usually of late years been established for use at other seasons.

As above indicated, almost all the larger river-valleys hold more or less timber; and in the northern part of the region this is not confined to the bottom-land, groves and thickets spreading also into the lateral valleys ("coulées") and broken ground which is very generally to be found in the vicinity of these great river troughs. Should any serious opposition be offered to the expeditions now on their way to quell the present unfortunate disturbances, it will in all probability be at one or other of the "crossings" which naturally lend themselves to defence. The rivers, as might be expected from the considerable general inclination of the surface, are usually rapid and shallow, with numerous gravel-bars, and reefs of boulders, at low water. They are often, moreover, extremely tortuous; and in consequence of these peculiarities, and the considerable portion of each year during which they are icebound, they are not extensively utilized as means of communication; and trains of waggons or Red River carts are still generally employed in travelling, or in the transport of supplies and goods at a distance from the railways. The Hudson Bay Company has, however, for a number of years, used a couple of small stern-wheel steamers between the Grand Rapids, near Lake Winnipeg, and Edmonton, far up on the North Saskatchewan. Two or more steamers of the same class have quite lately

been placed on the South Saskatchewan; and it is proposed to employ these in the present emergency in carrying supplies from Medicine Hat, where this river is crossed by the Canadian Pacific Railway, to the vicinity of Prince Albert.

This portion of the interior of the Continent was reached in the days of the fur companies, either by the canoe route from Lake Superior, or by ascending the Nelson River from York Factory on Hudson Bay; and it was by the first-mentioned that Sir Garnett Wolseley, with his little force, penetrated to the valley of the Red River in 1870. When St. Paul had become a commercial centre, the Hudson Bay Company began to bring the greater part of its goods from the south; while in later years the police-posts, settlements, and cattle-ranches established in the Far West were supplied from Fort Benton, on the Missouri. The Canadian Pacific Railway, pushed with unexampled rapidity from Winnipeg across the plains, and completed to the summit of the Rocky Mountains about eighteen months ago, has, however, completely changed the old lines of travel. The time-honoured trail from the Red River by Forts Carleton and Pitt to Edmonton—a journey of nearly nine hundred miles, requiring, with loaded carts or waggons, under the most favourable circumstances, nearly forty days—need no longer be followed. The points above mentioned, with other isolated little settlements of more recent date along the North Saskatchewan, are now reached by new trails from the nearest stations to the south on the railway; and a system of telegraph lines, constructed and operated by the Government, unites the more important of them. After leaving the railway, however, the distances to be traversed in the old-fashioned way, before the more remote settlements are reached, are

still very considerable. Thus to Carleton and Prince Albert, from Qu'Appelle station, the trail distances are 228 and 153 miles respectively; from Swift Current station to Battleford, 202 miles; and from Calgary to Edmonton, 191 miles.

The length of this note does not admit of any detailed description of these and other main roads. It may be remarked, however, that while the trail from Qu'Appelle toward Carleton and Prince Albert, as far as the crossing of the South Saskatchewan, is generally through an open country, groves and belts of aspen are not infrequent in its vicinity. The longest stretch quite without timber is that known as the Salt Plains, about thirty miles only in width.

The country in the vicinity of Carleton, Prince Albert and Duck Lake is rolling, or characterized by low hills with numerous and in some cases extensive groves ("bluffs") of wood. The settlement is of a scattered character, but for the most part confined to the point of land between the two branches of the Saskatche-

wan, the total population being probably about three thousand.

At the crossing of the South Saskatchewan, by the trail from Swift Current to Battleford, there is a good ferry. This trail, to within about twenty miles of Battleford, is entirely destitute of wood. Battleford was at one time selected as the seat of Government of the North-West Territory, but, since the definite location of the railway, has been abandoned in favour of Regina. There are scattered settlements of Half-breeds and whites in the neighbourhood, and several Cree Indian reserves. The trail from Calgary to Edmonton crosses the Bow, Red Deer and Battle Rivers, and several smaller streams flowing from the foot-hills and mountains. Ferries exist where necessary; and, should these not be destroyed, a rapid advance by this route would be easy. For sixty miles there is no wood on the trail, beyond that point timber is abundant. Edmonton is a somewhat important centre, with a number of little settlements of whites and Half-breeds subsidiary to it.—*Science*.

SCRIPTURE LESSONS FOR SCHOOL AND HOME.

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

NO. 3. THE SECOND COMMANDMENT.

INTRODUCTION. Let the children repeat the commandment carefully. Teacher should then explain the meaning of the difficult words:—(a) *Graven, i.e.*, carved out of wood or stone, from old word "to grave" (hence "engrave") as distinct from "molten," or cast in a mould, as was the golden calf. (b) *Likeness* in picture or image of sun and stars in heaven, animals in earth, fishes in sea. None of these to be made for purposes of worship. Does

not forbid paintings and sculpture for ornament. Remind of graven oxen supporting the laver in the Tabernacle, and similar carvings expressly commanded by God. (c) *Jealous, i.e.*, full of zeal for His own glory—not willing to be deprived of honour due to Himself.

I. SIN FORBIDDEN. Summed up in word *Idolatry*—worshipping any image of God or worshipping God under any outward form. Perhaps ask "why not?" Because God is a Spirit—not like any created thing—cannot know what God is like. Be-

sides, worshipping God under form of image often led to worshipping images themselves. (Read Exod. xxxii. 1—8.) Show carefully difference between this and first commandment. That forbade worship of other gods—this forbids worshipping God under outward forms. This the sin of Jeroboam in making golden calves. Perhaps think no temptation to us to this sin—how can we break this commandment? Yet often do so. What is the sin? Putting outward things in place of God. Do so when trust to “saying our prayers” instead of really praying—or to mere attendance at worship instead of real worship—drawing nigh to God with lips instead of heart. Both forms of this sin equally displeasing to God. Punished Israelites by slaying 3,000. (Ex. xxxii. 28.) Refuses to hear prayers merely uttered with lips. (Isa. i. 14, 15.)

II. DUTY COMMANDED. (Read Dan. vi. 16—26.) *Worship*. Question on the well-known story. Daniel the King's prime minister—praying three times a day—threatened with the lions—continuing to pray with windows open, so that all might see—trusting to God to deliver him, and therefore not afraid. Teaches how to draw near to God in *worship* and *prayer*. Must worship God in right way, as He has appointed. Gave Israelites Tabernacle with solemn services, sacrifices, yearly festivals, etc. Christ set example of keeping these. Went to Passover feast always during His three years' ministry—went to service at Tabernacle every Sabbath. But has warned us to worship in spirit and truth. (John iv. 24.) St. Paul tells us to “pray with the understanding.” Therefore must take care *whom* we worship—*how* we worship—*why* we worship. Then may expect God's blessing. He will show mercy to thousands (of generations) of those who love Him and worship Him aright.

LESSON. *God is a Spirit, and they that worship Him must worship Him in spirit and in truth.*

NO. 4. THE THIRD COMMANDMENT.

INTRODUCTION. Children to repeat Commandment carefully. Teacher explain “taking in vain” as using God's Name lightly, irreverently, without thought. Those who do so will be counted as guilty. Should not allow a parent's or friend's name to be held in dishonour before us—still less the holy Name of God.

I. SIN FORBIDDEN. (a) *Perjury*, or false swearing. (See Lev. xix. 12.) As an example of such, remind of Jezebel's false witnesses against Naboth (1 Kings xxi. 13), or of the Jews against Christ (Matt. xxvi. 60.) Great deal such heard even in English law-courts. Such form of lying especially bad—calling God to witness to what is false. Remind how Ananias and his wife were punished with death (Acts v. 9); (b) *Blasphemy*, or using God's Name lightly or with contempt. (Read Lev. xxiv. 10—16.) How severely this sin was punished among the Jews—how little it is thought of among Christians. Nothing commoner than to hear God's Name lightly used both in blessing and cursing; (c) *Irreverence*. (Read 2 Sam. vi. 3—7.) What was the Ark? Outward sign or symbol of God's presence. Who had charge of it? Levites specially appointed. Now being taken in solemn manner from Philistines. What did Uzzah do? Forgot how holy it was, and treated it in common manner. How his death would warn Israelites against irreverence.

See how this comes home to us. Forbids all use of God's Name, except in proper way and at proper times—irreverent manner of reading Bible—jesting about holy things—irreverence in worship—idle words and thoughts, etc.

II. DUTY ENJOINED. *Reverence.* (Read Matt. xxi. 12, 13.) An account here of one of our Saviour's last visits to the Temple. Why did He go there? But what was going on there? Buying and selling oxen, sheep, doves for sacrifices—the noise and hubbub of a market. What did He do? What did He say? God's House for prayer, not for merchandise. Teaches us to reverence, or honour, or hallow *God's House*. Must not take thought of business there—must reverence God's sanctuary. So, too, with *God's Name*. Must speak it carefully. (Jews always used to pause before saying it.) And also must

honour *God's Word*. He speaks to us in the Bible—make known His will—must treat it as message from Him. Next commandment will teach us to honour also *God's day*.

This reverence must be shown in outward act. Remind how Moses at the bush was bidden to take off his shoes because God was there. (Exod. iii. 5.) So in our manner, mode of speech, etc., can show reverence. But, above all, must have feeling in heart—fear of God—love to God—honour of all that is holy. This will fit heart for enjoying God's presence hereafter.

LESSON. *The Name of the Lord is holy.*

NOTES FOR TEACHERS.

ONE of the surest tests of genuine knowledge is modesty.

THE Pope, replying to an address of French operatives, traced the evils affecting the working classes to their abandonment of the principles of religion, and to their submitting themselves to the influence of agitators.

THE overseers of Harvard College have, very properly, refused the petition of a portion of the students for the virtual abolition of college prayers, since voluntary attendance, under the circumstances, would mean the discontinuance of all devotional exercises, and, finally, the suspension of all religious services in connection with this ancient seat of learning.

THIS is the time for health-building; let us make the best of it. Hie to the far woods and green plains! Unstop the ear to the song sung by the lake and the soothing chant of the wind in the lofty tops of

of our Canadian trees. We salute thee, Canada the free, the fair.

THE schools and colleges are closed. Scholars and teachers are scattered on the plains and mountains of Canada. Co-workers give the worrying thoughts of examinations and results to the winds. We should enter, if even for a little while, the school of travel, not the school of art, but the school of nature. Before going anywhere else, visit our own beautiful lakes: Ontario, Erie, Huron, Superior, and the home-like loch lake Simcoe.

IN looking for places of amusement and recreation abroad, do not overlook those at your door. Canada abounds in streams and brooks teeming with wholesome fish. There is many a nook in our country whose beauty has not yet been seen by an appreciative eye. Go, visit and tell. And to complete the circle of your pleasure, do not forget to take books for companions, the reading of which will be helpful for the work of the

coming years. We make no list of such; you know those you need most.

SOME WORDS FOR BOYS.—Many people seem to forget that character grows: that it is not something to put on ready-made with womanhood or manhood; but day by day, here a little and there a little, grows with the growth and strengthens with the strength, until, good or bad, it becomes almost a coat of mail. Look at a man of business—prompt, reliable, conscientious, yet clear-headed and energetic. When do you suppose he developed these admirable qualities? When he was a boy. Let us see how a boy of ten years gets up in the morning, works, plays, studies, and we will tell you just what kind of a man he will make. The boy that is too late at breakfast, late at school, stands a poor chance to be a prompt man. The boy who neglects his duties, be they ever so small, and then excuses himself by saying, "I forgot; I didn't think," will never be a reliable man; and the boy who finds pleasure in the suffering of weaker things will never be a noble, generous, kind man—a gentleman.—*Exchange.*

DR. JACOBI, who has made this a special study, concludes that, as a rule, a child should not be sent to school before he is eight years old. Not till this age is its brain substance sufficiently developed. An infant's brain is soft. It contains a large percentage of water; it is deficient in fat and phosphorus, on which, to a great extent, intellectual activity depends. The convolutions are fewer. The different parts of the brain do not grow in size and weight alike—the normal proportion of the front, back and lateral portions not being reached before the age of ten. So, too, the normal proportion of the chest to the lower portions of the body is not attained until the eighth year, while that part of the

back (the lumbar) on which the sitting posture mainly depends, is even then only moderately developed.

DYNAMITE.—Dynamite is prepared by saturating some porous substance with nitro-glycerine, and for this purpose, charcoal, sawdust and vegetable fibre have been used; but infusorial earth (earth mixed with animal or vegetable matter) seems best adapted to serve as the absorbent.

Nitro-glycerine is the most important of modern explosives; it is a thick, heavy oil with a sweet burning taste, and is readily prepared by the action of a mixture of sulphuric acid and nitric acid upon glycerine. Great care must be used in its preparation. Nitro-glycerine is so explosive that it is dangerous to handle and cannot be transported with safety. It is largely used in the oil regions and was employed in tunnelling the Hoosac Mountain. When the nitro-glycerine is mixed with a porous substance its properties are changed and it is much less easily exploded; therefore ordinary dynamite can be transported with ease and the time of the explosion governed more simply. An ordinary dynamite possess about ten times the power of an equal weight of gun powder, and its effect is largely local, being more violent at the point of explosion.—*Condensed from American Inventor.*

OUR FISHERIES.—The fisheries of Canada rank fourth in the list of natural products. The value last year being \$17,766,404, of which one-half was exported.

A very large proportion, nearly one-half, is found in the waters of Nova Scotia; next in order come New Brunswick, Quebec, British Columbia, Ontario, and Prince Edward Island.

The chief varieties are cod, herrings, lobsters, mackerel, and salmon. The *cod* forms one-fourth of the whole export, less than one ninth of it

is used in Canada, the West India Islands receiving the largest export.

The *herring* is consumed altogether in Canada, the *lobsters* come chiefly from New Brunswick, one-half being sent to Great Britain and the United States. The *mackerel* comes from Nova Scotia and is nearly all sent to the United States. The most valuable *salmon* waters are in British Columbia. The annual yield is valued at one million dollars; of this \$600,000 goes to Great Britain, \$300,000 to the United States, and less than \$200,000 is used in Canada.

Although nearly one-half of the entire yield of our fisheries goes to the United States, a considerable quantity of this only passes through the hands of dealers there to the Upper Provinces of the Dominion, and this is being rapidly remedied by the greater facilities for transport offered by the Intercolonial Railway.

THE Revised Version of the Old Testament has at last been printed, after twelve years of continuous labour on the part of the most eminent American and English Biblical scholars of the time. It has been found that the revisers have left the King James' Version, which the English-reading world has used since 1611, almost undisturbed so far as the meanings of passages are concerned. Their revision is mainly marked by such verbal changes as are manifestly in the interest of accurate interpretation. The result is therefore a tribute to the scholarship which produced the King James' Version, and the Bible stands to-day practically the same volume, speaking the same language and conveying the same messages as it has stood since Moses' time. It is still the same Bible our fathers read, save in a few verbal respects which are of slight consequence as affecting those great doctrines and principles upon which the growth of civilization has so vitally

depended. As important a change as any other is in the commandment "Thou shalt not kill," which has become "Thou shalt do no murder." But as a rule the ordinary reader may peruse the Book from beginning to the end and be undisturbed by readings so novel as to create a shock. The revisers, despite all the attacks which infidels and persons speaking in the name of Science have made upon the Bible, have not been moved from an attitude of the strictest conservatism. They are men who are closely identified with all the great contemporaneous movements in literature, education, and religion and who are profoundly cognizant of those plausible heresies which seek to substitute other creeds for those of the Bible, yet they have come forward in an age when myths are remorselessly assailed and when superstitions are crumbling to hold up the Bible as the immutable, unabating, proved, and accepted Word of God.—*Selected.*

EXTRACTS from an address recently delivered by the Right Hon. W. E. Forster, Manchester :

"I must, however, just make one statement. I do hope that if any attempt be made to bring down the cost (and of course every right economy ought to be practised), I do hope it will not be by diminishing the teaching staff. That is quite small enough already, in fact too small. I have heard of cases where eighty children were under the care of one mistress, and even of a hundred under an assistant and a young pupil teacher. I do not think you would find this state of things anywhere on the Continent, certainly not in Germany."

"The next question is, and will probably for some time continue, much debated—I mean the curriculum of elementary schools. What should be taught in them? My own idea is that reading, writing, cyphering, and

a knowledge of the Bible are of infinite importance. They are the necessities in education; other things may be called the comforts, or even the luxuries. But I do go so far as to say that children ought to have as much sound knowledge put into their heads as is possible in the time they are able to stop at school."

"The religious instruction is, I suppose, under present conditions a matter which could not be undertaken by the State; but we should do all that we can to prevent those who have the most serious and difficult task of taking care of young children from going to their work ignorant of what the sanction religion gives to morality really is."

"Before I sit down I will make one suggestion on a matter which seems to me to be a matter of real import-

ance. In Scotland there is an affiliation between the training colleges of Edinburgh and Glasgow and the Universities. It works very well there, and I find teachers and others think it would work well in England also. I think, myself, it would be of immense advantage if the training schools could be so connected with the colleges that the students could obtain the benefit of the larger culture of the Universities while they also obtained the necessary technical instruction, and thus earn at once certificate and degree. It would be a matter of very considerable difficulty; but I would suggest whether a Teachers' Hall could not be established at Oxford or Cambridge. It may be an impossible or impracticable idea; but I throw it out for the consideration of those interested."

GEOGRAPHICAL NOTES.

PORT HAMILTON, an island recently annexed by England in the Korean waters, is thirty-eight miles N.N.E. of the Island of Qualpaert. It is completely sheltered by three islands, and has a spacious harbour about two miles long with a depth of from nine to twelve fathoms. The population numbers about 2,000 employed in the cultivation of millet. The island is twenty-five miles south of the Korean mainland.

AMERICA.—It is now claimed that a party of Buddhist missionaries from Afghanistan visited Mexico and Central America, by way of China in the last half of the fifth century. A book has recently been written by E. P. Vining, Chicago, on the subject in which are brought together many facts throwing great light upon it, such as the high state of civilization found among the Indian tribes facing China, and

material evidence from Chinese records, traditional records in Mexico, etc., etc.

THE TRENT VALLEY CANAL.—The work on this important water route is now being vigorously prosecuted. Twelve locks have already been built and the surveys completed throughout. It passes through Lakes Simcoe, Balsam, Cameron, and other waters *via* Peterborough to Trenton, will connect the Georgian Bay with the Bay of Quintè, forming a new waterway by the River St. Lawrence. The route from Lake Superior to Montreal by this canal will be 500 miles shorter than from the same district through the Erie Canal to New York.

MAGNIFICENT TIMBER REGION.—Few people have any good idea of the vast timber resources of Toulumme County, California. Lying on the

southern boundary, along the Mari-
posa line, on the upper waters of the
south and middle forks of the Tou-
lumme River, is the finest body of
lumber timber in the world. Here,
for sixty miles, is an unbroken forest
of sugar pine, yellow pine, red and
white fir and spruce. The trees are
enormous in size and rise to magnifi-
cent heights, while the growth is so
dense as to plunge the depths of the
forests into a perpetual gloom. The
trees average from five feet to ten feet
in diameter, and their freedom from
limbs and knots greatly enhances their
value for lumbering purposes. Noth-
ing extraordinary to find pine and fir
trees ten and twelve feet in diameter,
straight as an arrow, rising to a height
of 150 or 200 feet.

—
GEOLOGICAL SURVEY OF THE
UNITED KINGDOM.—At a recent
meeting of the Royal Society of
Edinburgh, Dr. Archibald Geikie,
President of the Geological Sur-
vey, delivered an address on the
recent progress of the Survey of the
United Kingdom. This survey was
began fifty-three years ago and has
from the first been more or less sub-
sidized by the Government, although
an eminent geologist began at his
own expense to map the South-West-
ern portion of England. Quite recently
the survey of the North of England
has been finished and on towards the
Scottish border. In Yorkshire the
most beautiful example of table land
deposit anywhere in Britain is found.
The survey of Ireland, with the
exception of the extreme North-West,
is completed. The wolds of Ireland
go back to a very early geological
period, and the whole of that region
must at one time have been covered
with coal fields. In Scotland they
had now reached as far as the High-
lands, and have found many interest-
ing and remarkable features especially
connected with the fossil remains;

and in Sutherland and Ross a certain
rearrangement of the rocks causing
great alterations. When this inter-
esting survey is completed a popular
report of it would be very useful and
acceptable.

—
ALL ABOUT NEW GUINEA.—New
Guinea is a long island stretching
from north-west to south-east some
1,500 miles, and it consists of a broad,
solid mass of land in the middle, with
narrower peninsulas at each end.
Such explorations as have been made
have for the most part been in those
peninsulas, which are very moun-
tainous and inaccessible. The Eng-
lish missionary settlement of Port
Moresby is on what is now British
territory, the south coast of the eastern
peninsula, in long. 147°. No one has
as yet been able to cross this peninsula
except at the extreme end, nor even
to reach the great chain of mountains
running along its middle, one of
which, Mount Owen Stanley, is more
than 13,000 feet high. In the great
central portion of the island are
mountains much higher than this.
Glimpses have been had of great
ranges which are believed to run right
along the centre of this country,
coming in at the western end to the
south coast at Cape Buru, in long
135°, near which their summits have
been seen out at sea, white apparently
with snow, and rising to a height of
nearly 17,000 feet—higher than any-
thing in the Alps of Europe. They
may join the Albert Mountains, which
seem to run into the heart of the
island west of Mount Owen Stanley,
and the great Finisterre Mountains
on the north coast, in long. 146°. Almost all the north coast is very
mountainous, with a steep shore and
a deep sea; but at the western corner,
east of the great opening called
Geelvink Bay, there is flat country,
with the mouths of what seem to be
a mighty river. For ships many

miles out at sea have sailed through masses of driftwood, swept down from the unknown forests. South of the mountains there is a much wider expanse of level country: indeed, from Cape Buru eastward to the head of the Gulf of Papua, the coast is low and swampy, and there are many mouths of large rivers generally choked with timber. But the Fly River, which enters the sea on the

western side of the Gulf of Papua, has been ascended for many miles till the central mountains were seen at a great distance. Behind Port Moresby, and further east, the south coast is hilly. Earthquakes are common in New Guinea, but no one has as yet discovered an active volcano there, though there are several in the islands to the north.—*Cassell's Family Magazine*.

EDITORIAL.

BIBLE READING IN SCHOOLS.

WE had pleasure in commending the action of the Government of Ontario when its decision was announced that each school should be opened with the public acknowledgment of its dependence on the Creator. A clear recognition by each master that there is a beneficent Being in whose care we all are, whom it is a privilege and a duty to confess and honour in all our undertakings, that all our work may be "begun, continued and ended in Him."

In our opinion nothing is more vital to the well-being of a people in trade, commerce, or literary activity than the direct unquestioned recognition of the fact of our dependence upon and accountability to Jehovah God. Therefore hailed we with joy the public announcement of this order by the Government: "The schools shall be opened," etc., etc.—the Ark of safety for our country. "The Bible in the schools"—the sheet anchor for the morality of our people. We heartily commend all those who would give no rest till the symbol of our progress and liberties was publicly acknowledged. The Provincial Government, in taking this decided step, only voiced forth to the world the deliberate judgment of the people of

the Province. Had they acted otherwise, they would have been unfaithful to the public conscience. The many low sounds of discontent which had been uttered for long years had gathered into an irresistible demand; the zeal of the spirit of those who guide the counsels of nations had marshalled the strength of the chosen ones into a tangible form; and woe to the laggard politician who had been found wanting in the day of the judgment that was going forth to mould for ages the generations of the sons and daughters of Ontario.

We need not now refer to the toying with this important question, the hesitancy, the balancing, etc., etc., as the doing and the result comfort the hearts of the workers good and true.

The crisis was on, it lasted for two or three years—any body of men found untrue to the highest interests of our people would be driven from the seat of power with execration.

We think it necessary to ask our readers to remember that the Bible has been read in the schools of our Province for years past, and more so then than now. Seeing then that this law has gone forth with the authority of the Government, what is the duty of the teacher with regard to it? Will our readers turn to a recent number of this magazine, and read

carefully a letter from a head master of one of our most prosperous public schools, and learn what he does, and how he does it. The work there so modestly described, he has carried on for years; we say to each teacher: "Go thou and do likewise." The Book should ever be read with reverence, with earnestness, with joy. Cherish the thought in the inmost recesses of your being that the spirit which it breathes and enjoins keeps our literature pure and saves even the British Empire from corruption; remember it is the golden thread which binds the trade and commerce of our Empire to the throne of God. As you bear those solemn facts in mind give due diligence in view of your precious opportunities.

"Without note or comment."—That sounds like a Government regulation. Suppose in the course of your reading the word "Moses" should occur; are you not allowed to inform your class who Moses was, what he did, what became of him?

The word "Philistine" comes up in the course of your daily Bible reading, are you not to say a word about Philistia or the Philistines? The Bible is a unique book, full of history, geography, and descriptions of manners and customs; are we not to say a word about these things? Impossible! Our teachers will remember that they are not forbidden such as these. You will not bother with Episcopacy, Presbyterianism, Congregationalism, Methodism, Roman Catholicism (such long words). The churches will take care of them; the children will not care for them. We conducted Bible reading for many years in a Public School, and the occasion never arose for defining points of difference between sections of the Church; we were one household, one family, learning what the Father had revealed of His will for us—that was enough. Now, dear brethren of synods, conferences and assemblies,

we take that to be our duty in this weighty matter. We wish to have the 6,000 teachers of Ontario, year in year out, giving no uncertain sound on this vital question—that God has spoken to man, and that we have his written word for our sure guidance; you will help us, you will make the country confess and allow us to feel that when we work in our school-rooms we pray effectually as we work rightly.

The objection is frequently made to Bible reading that the Scriptures are read in an indifferent, mechanical, careless style, and therefore they had better not be read in our schools at all; but let the unconscious influence of the teacher's Christian character be free to do its work. Do they forget the living power of the written word, or do we reason thus in regard to Bible reading in the home where many a time, unfortunately, the book is read in a hurried, careless manner, and even in our churches, we occasionally have mechanical reading. Do we, therefore, say better not read the Bible in the church? Do we not rather regret the imperfect work done in this connection as in every other, and long for the perfect and true reading of the precious book there?

We have written thus strongly about Bible reading in the schools; but not for one moment do we intend to convey the impression that we do not attach the very greatest importance to the personal character of the teacher. That indescribable power, the unconscious influence for good or evil which a teacher exercises in the school, is a vital element and ought never, in any circumstances, to be overlooked. Let every effort be put forth to secure God-fearing men and women for this high office; but give us with this and apart from this the Bible in our schools.

For the accomplishment of this part of the teacher's work the Minister of Education has provided a book

of extracts for reading in the schools. We have a copy of this book ; but we have not one word to say in favour of it. We have looked through it, and find no indication as to where these extracts have come from. We are so much ashamed of the Department in this respect, that we will not put upon paper what we would feel called upon to say about it. A wretched piece of work ! Our people want, and must have the whole Bible—the Word of God—nothing more, nothing less, for use in our schools.

What were the public assemblies of the Church of Christ doing this year that hardly a word was uttered on this subject. How would they feel if a ukase went forth from some Cæsar that from the pulpits only certain extracts for the instruction of the people were to be read ? Oh, it did not occur to us in this way. Therefore, we say, let us have the whole Bible in its right place—in the pulpit, in the school, in the family.

THE LATE PRINCIPAL BUCHAN.

SINCE our last issue the teaching profession of Ontario has suffered a heavy loss in the lamented death of Mr. J. M. Buchan, Principal of Upper Canada College. His demise has occurred at a comparatively early age, when the professional experience he had gained and the special studies of his life had fitted him for important work in connection with teaching in whatever sphere seemed to lie before him. Though lacking in those magnetic qualities that are the special gift of the successful educator, Mr. Buchan had a personality which, we believe, impressed itself deeply on those with whom he was in sympathy, and who, despite the seeming coldness and reserve of his manner, were drawn to him by professional or social ties. He was an ardent student of English literature, a good general scholar, and an efficient headmaster and principal

of the institutions he severally governed. As a High School Inspector, and member of the Central Committee, he rendered able service to the Education Department of the Province, for his duties were always faithfully and intelligently performed, and he was eminently discreet and unimpassioned. Of recent years his maturing mind took a tinge from current philosophy and science, and this bent led him to take a hearty interest in the Canadian Institute, of Toronto, and for a time, as its President, to give a substantial impetus to its affairs. With unaffected sorrow we mourn his untimely death. In that institution, as well as in the field of Provincial Education, Principal Buchan will be much missed.

OUR people have a problem to solve in the North-West Territories : How best to save our Indian population ? To the solution of this question all the information we can gather, all the energy of our best men and women, consecrated culture and skill must be devoted. To help, we take the facts following from the *New England Journal of Education* :

“The school at Salem, Oregon, was the second school established by the United States Government for the education of Indian children. There were at the time of our visit ninety boys and sixty girls in the school, and the number has been largely increased since. These children are from seven to twenty years of age, and are the representatives of twenty-three tribes, extending over a wide section of country, reaching from British Columbia to California, and from the Pacific Ocean to Montana. These children are taught in arithmetic, geography, grammar, U. S. history, reading, spelling, writing—all in the English language. No conversation in the Indian languages, or in Chinook, is allowed. They are taught regularly, also, in carpentering, farming, shoemaking, blacksmithing, waggon-making, etc. The girls are all taught to cook, to wash, iron, sew, and many other things. They have a printing-press, and the boys print and publish a small, monthly newspaper called the *Indian Citizen*.

“The girls do all the cooking, all the house-

work, make all their clothing, etc. The boys do all the work upon their side of the establishment. Much of the building is done by them, all the painting of the buildings, inside and outside, and the bedsteads and much other furniture are made by them. These children are selected by the superintendent for their physical and intellectual superiority, subject to the approval of the Commissioner of Indian Affairs.

"Their course of study extends over a period of five years. They have military drill, which the boys decidedly enjoy. There is very little difficulty in regard to discipline. Their punishments are similar to what pertains to army life.

"They have a perpetual provision at Forest Grove that no whiskey shall ever be sold in the town. This prohibitory law has now been strictly enforced for nearly forty years.

"These Indian youths are supported at the

school by the Government, and subsequently either return to their people or live among the whites. Many of them, on returning to their homes among their friends, drop back into Indian modes of living, but generally do not entirely give up their civilized ways. Those, however, who live among the whites almost always retain their civilized notions and customs which they have acquired at the school.

"It was a delightful day, and we all thoroughly enjoyed our visit. The above description has been minute, on account of the wide interest existing in relation to Indian education. If our government would appropriate for these schools one-tenth part of the cost of supporting an army to hold the remnants of their tribes in subjection, operating thus through the children, they would remain at peace, and their condition would be rapidly improved."

SCHOOL WORK.

THE CLASS-ROOM.

DAVID BOYLE, Editor, Toronto.

EDUCATION DEPARTMENT, ONTARIO.

JULY EXAMINATIONS, 1885.

Third Class.

ENGLISH GRAMMAR.

Examiner—John Seath, B.A.

1. Describe, in your own words, the function of the adjective, explaining clearly the meaning of the terms "describing," "qualifying" and "limiting," and applying your description to the adjectives in the following: *the man, five boys, good men. His kind father is dead.* [14.]

2. Explain in your own words the terms "Government" and "agreement," and illustrate by reference to all the governing and agreeing words in the following:—

If need be, thou shalt see thy master's efforts to win these laurels. [12.]

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

(a) When a superlative is used, the class between which the comparison is made and

which is introduced by *of* should always include the thing compared: as "Bismarck is the greatest of German statesmen," or "Bismarck is the greatest German statesman." [8.]

(b) The sign *to* should not be used for a full infinitive unless the verb in the same form can be supplied from the preceding part of the sentence: as, "you never wrote me: you ought to" is wrong, since it is incorrect to say "you ought to wrote." [5.]

(c) The perfect infinitive is used when the act spoken of is regarded as completed before the time expressed by the governing verb: as, "I hoped to have gone before the meeting." [7.]

4. Distinguish the meanings of:—

(a) *If he go, I shall go,* and *If he goes I go.* [3.]

(b) *I think so, I do think so, I am thinking so,* and *I should think so.* [6.]

(c) *He shall go, He will go,* and *He is about to go.* [4.]

(d) *I knew that he speaks the truth,* and *I knew that he spoke the truth.* [3.]

(e) *Who did it?* and *Which did it?* [2.]

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

(a) *He is a fool to sit alone.* [6.]

(b) *Much to my surprise, he forgave them their fault.* [4.]

(c) He is too old to play the fool. [6.]

(d) My dream last night came true. [6.]

(e) The daughter of a hundred earls,
You are not one to be desired. [6.]

6. Classify the propositions in the following, giving their relation:—

Because half a dozen grasshoppers under a fern make the field ring with their importunate chink, while thousands of great cattle reposing beneath the shadow of the British oak, chew the cud and are silent, pray do not imagine that those who make the noise are the only inhabitants of the field—that, of course, they are many in number—or that, after all, they are other than the little, sh-rivelled, meagre, hopping—though loud and troublesome—insects of the hour. [10.]

7. Translate into a phrase each of the following:—

(a) *Sheep-dog, wood-work, railway, steam-boat.* [4.]

(b) Translate into a compound each of the following:—*As dark as coal, that can keep in water, surrounded by the sea, tearing asunder the heart.* [4.]

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

(a) These pronouns are indeclinable and used in the singular only. [3.]

(b) He looks like his mother does, but he talks like his father. [3.]

(c) He was afraid he would be burned. [4.]

(d) The references will be found useful to the junior student and enable him to obtain an insight into the subject. [3.]

(e) A second division of lands followed and the poet was not only deprived of his estate, but barely escaped with his life when fleeing from the onset of his enemies. [3.]

(f) Trusting that you will remember us, and write as often as you can spare time, and with best love (in which we all heartily join) remember me as ever, etc. [6.]

(g) There are many boys whose fathers and mothers died when they were infants. [4.]

(h) Shall you be able to sell them boots? [4.]

(i) Of all my rash adventures past,
This frantic feat must prove the last.

(j) Nor frequent does the bright oar break
The darkening mirror of the lake,
Until the rocky isle they reach,
And moor their shallop on the beach.

ENGLISH LITERATURE.

NOTE.—150 marks constitute a full paper. In valuing the answers, marks will be deducted for bad literary form.

1. What is the connection between the Spenserian stanzas and the rest of "The Lady of the Lake"? Give details in each case. [18.]

2. Quote the description of Loch Katrine at "summer dawn." [10.]

3.

"Have, then, thy wish!"—he whistled shrill,
And he was answered from the hill;
Wild as the scream of the curlew,
From crag to crag the signal flew.
Instant, through copse and heath, arose 5
Rockets, and spears, and bended bows;
On right, on left, above, below,
Sprung up at once the lurking foe;
From shingles gray their lances start,
The bracken bush sends forth the dart, 10
The rushes and the willow-wand
Are bristling into axe and brand,
And every tuft of broom gives life
To plaided warrior armed for strife.
That whistle garrisoned the glen 15
At once with full five hundred men,
As if the yawning hill to heaven
A subterranean host had given.
Watching their leader's beck and will,
All silent there they stood, and still; 20
Like the loose crags whose threatening mass
Lay tottering o'er the hollow pass,
As if an infant's touch could urge
Their headlong passage down the verge,
With step and weapon forward flung, 25
Upon the mountain-side they hung.
The Mountaineer cast glance of pride
Along Benledi's living side,
Then fixed his eye and sable brow
Full on Fitz-James—"How sayst thou now?
These are Clan-Alpine's warriors true; [30
And, Saxon—I am Roderick Dhu!"

(a) Develop the meaning of "are bristling," "gives life," "as if the yawning hill to heaven a subterranean host had given," "their leader's beck and will," "hollow pass," "urge their headlong passage down the verge," "Benledi's living side," "fixed his eye and sable brow." [24.]

(b) Indicate the chief means by which the poet has given beauty and force to his language. [20.]

(c) What is meant by describing this scene as highly dramatic? [4.]

(d) Write concise elocutionary notes, bringing out as fully as possible the spirit of the passage. [10.]

4. Contrast life in the village before Rip's long sleep with life there on his return. [16.]

5. Whoever has made a voyage up the Hudson, must remember the Kaatskill Mountains. They are a dismembered branch of the great Appalachian family, and are seen away to the west of the river, swelling up to a noble height, and lording it over the surrounding country. Every change of season, every change of weather, indeed every hour of the day produces some change in the magical hues and shapes of these mountains; and they are regarded by all the good wives, far and near, as perfect barometers. When the weather is fair and settled, they are clothed in blue and purple, and print their bold outlines on the clear evening sky; but sometimes, when the rest of the landscape is cloudless, they will gather a band of gray vapours about their summits, which, in the last rays of the setting sun, will glow and light up like a crown of glory.

(a) What personal attributes does Irving assign to the Kaatskills in this description? Develop the meaning of each of the expressions used to denote these attributes. [20.]

(b) *Every change—barometers.* Account for the repetitions here. What justification does Irving give for describing the mountains as "barometers"? [4.]

(c) We have "are clothed" and "print," but "will gather" and "will glow and light up." Explain this use of "will." [6.]

(d) Distinguish the meanings of "made a voyage" and "sailed," "bold" and "distinct," and "glow" and "light up." [6.]

(e) Show from the derivation, the exact meaning of "dismembered" and "perfect."

[6.]

(f) What characteristics of Irving's style are here exemplified? [6.]

6. Write concise, critical, and explanatory notes on the following passages: *

(a) *The Knight of Snowdoun, James Fitz-James;*

Lord of a barren heritage,
Which his brave sire, from age to age,
By their good swords had held with
toil;

His sire had fallen in such turmoil,
And he, God wot, was forced to stand
Oft for his right with blade in hand. [7.]

(b) And thus an airy point he won,
Where, gleaming with the setting sun,
One burnished sheet of living gold,
Loch Katrine lay beneath him rolled,
In all her length far winding lay,
With promontory, creek and bay,
And islands that, empurpled bright,
Floated amid the livelier light,
And mountains, that like giants stand
To sentinel enchanted land. [18.]

(c) The rocks presented a high, impenetrable wall, over which the torrent came tumbling in a sheet of feathery foam, and fell into a broad, deep basin, black from the shadows of the surrounding forest. Here, then, poor Rip was brought to a stand. He again called and whistled after his dog; he was only answered by the cawing of a flock of idle crows, sporting high in air about a dry tree that overhung a sunny precipice, and who, secure in their elevation, seemed to look down and scoff at the poor man's perplexities. [7.]

Third and Second Class.

BOOK-KEEPING.

Examiner—Cornelius Donovan, M.A.

1. What is meant by: Assets? Bonded Goods? Debenture? Good Will? Lien? Mortgage? Power of Attorney? Staple Goods? Usury? Voucher? [10.]

2. (a) Briefly state the essential requisites of a Promissory Note. [12.]

(b) Brown gives Black his note at 4 mos. from to-day for \$150, negotiable and payable at bank. Write the note, dating it from Toronto. [7+5.]

* 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.

3. Journalize:—

(a) Commenced business with cash \$1,000, merchandize \$1,000, notes against sundry persons \$500.

(b) Bought of John Jones for cash, tallow worth \$160, and immediately sold it for \$140.

(c) The Dominion Bank has discounted my note against Harris for \$1,000; discount \$17.50, cash received \$982.50.

(d) Sold my house and lot to Green for \$2,500. Received in payment cash \$1,000, merchandize \$500; balance to remain on account.

(e) Consigned to Henry & Co., Montreal, goods to be sold on my account, invoiced \$645. Paid freight on same in cash \$36.50, and gave my note for insurance on do. \$19.35. [20.]

4. Classify the foregoing accounts according as they are "Resources and Liabilities," or "Losses and Gains." [6.]

5 Post all the items in No. 3. [18.]

6. State the object, and briefly describe the process, of closing the Ledger. [9.]

ORTHOEPY AND PRINCIPLES OF READING.

Examiner—J. Dearness.

1. Be good, dear child, and let who will be clever;

Do noble things, not dream them all day long:

And so make life, death, and that vast forever,

One grand sweet song.

Copy this stanza:—

(a) marking the pauses, longer and shorter, and respectively; and [5.]

(b) underlining the emphatic words. [5.]

(c) Give reasons for the pauses and the emphasis in the second line. [8.]

2. Abou Ben Adhem—may his tribe increase!
Awoke one night from a deep dream of peace.

And saw within the moonlight in his room,

Making it rich, and like a lily in bloom,
An angel, writing in a book of gold.

(a) With what quality or tone of voice should this be read? [2.]

(b) How should the connection between "saw" and "angel" be shown? [4.]

3. *Sky*. Signior Antonio, many a time and oft,

In the Rialto, you have rated me
About my moneys and my usances:
Still have I borne it with a patient shrug;
For suffrance is the badge of all our tribe.

You call me misbeliever, cut-throat, dog,
And spit upon my Jewish gaberdine,
And all for use of that which is mine own.
Well, then, it now appears you need my help:

Go to, then; you come to me, and you say,

Shylock, we would have moneys: you say so;

You that did void your rheum upon my beard,

And foot me as you spurn a stranger cur
Over your threshold: moneys is your suit,
What should I say to you? Should I not say,

Hath a dog money? is it possible

A cur can lend three thousand ducats? or
Shall I bend low, and in a bondman's key,
With bated breath and whispering humbleness,

Say this,—

Fair sir, you spit on me on Wednesday last.

You spurn'd me such a day; another time

You call'd me dog; and for these courtesies
I'll lend you thus much moneys!

(a) To what predominant feelings or passions should expression be given in reading this passage? How may they be expressed? [5.]

(b) Distinguish between Pitch and Force, and show where they should be varied in reading this passage. [8.]

(c) Give directions as to the reading of: 1. 5, "Well then," l. 9; "Go to," l. 10; "You," l. 12; and lines 16 and 17. [4 × 2.]

(d) Mark the inflection of "Antonio," l. 1; "Shylock," l. 11; "say," l. 15; "or," l. 17; "this," l. 20; "day," l. 22; "dog," l. 23; "moneys," l. 24. [8.]

(e) Illustrate Stress by reference to line 13. [3.]

4. Divide the following words into syllables, and mark the quantity of the vowels, and the accent:—*gaberdine, ducats, Wednesday, dynamite, trichina, meningitis, gladius.* [10.]

5. What is the sound of:

(a) *u* in *column, blue, rule.*

(b) *th* in *with, withe, beneath.* [5.]

Count fifty marks a full paper.

DICTATION.

Examiner—Cornelius Donovan, M.A.

NOTE FOR THE PRESIDING EXAMINER.—This paper is not to be seen by the candidates. It is to be read to them *three times*—*first*, at the ordinary rate of reading, they simply paying attention, to catch the drift of the passage; *second*, slowly, the candidate writing; *third*, for review. Value, 50.

It is no pleasure to me, in revising my volumes, to observe how much paper is wasted in confutation. Whoever considers the revolutions of learning, and the various questions of greater or less importance; upon which wit and reason have exercised their powers, must lament the unsuccessfulness of inquiry, and the slow advances of truth, when he reflects that a great part of the labour of every writer is only the destruction of those who went before him. The first care of the builder of a new system is to demolish the fabrics which are standing. The chief desire of him that comments an author is to show how much other commentators have corrupted and obscured him. The opinions prevalent in one age, as truths above the reach of controversy, are confuted and rejected in another, and rise again to reception in remoter times. Thus, the human mind is kept in motion without progress. Thus, sometimes, truth and error, and sometimes, contrarieties of error, take each other's place by reciprocal invasion. The tide of seeming knowledge, which is poured over one generation, retires and leaves another naked and barren; the sudden meteors of intelligence, which, for a while, appear to shoot their beams into the region of obscurity, on a sudden withdraw their lustre, and leave mortals again to grope their way.

DRAWING.

Examiner—J. A. McLellan, LL.D.

1. Illustrate by means of *pencil* drawings—no rulers to be used, distances to be judged by the aid of the eye alone:—

(a) A reverse curve with both upper and lower parts ovoid in character, base of reverse curve 3 inches long and upright, bases of the two parts of the curve, proportioned as 1 to 2. [2.]

(b) Three parallel straight lines $1\frac{1}{2}$ inches long, in left oblique position, lines about $\frac{1}{2}$ of an inch apart. [2.]

(c) A perpendicular, to a right oblique line, each about 1 inch long. [2.]

(d) A square, of 2 inches side, resting on one of its angles (corners), with one of its diagonals upright. [4.]

(e) An oval with diameters in the proportion of 1 to 2 inches, the longer diameter, in the left oblique position, making an angle of about 45 degrees with a horizontal. [5.]

(f) An upright view of a cone, with base above the line of sight, altitude 2 inches; horizontal diameter of base 1 inch. [5.]

(g) A water bottle in an upright position, with neck based upon a square of $\frac{1}{2}$ inch side; body based upon a circle about $1\frac{1}{2}$ inches in diameter—apply the reverse curve in the outline of the sides of the stand or pedestal on which the body of the bottle rests. No perspective effect required. [8.]

2. Draw, in freehand perspective, no rulers to be used:

(a) A rectangular block 4 inches long 3 inches wide and 1 inch thick, standing upon one end, to the left of the spectator and below the line of sight, and having the rectangular face 3 by 4 inches parallel with the picture plane. Divide the block into cubes showing all the edges of each cube. [14.]

(b) A rectangular box, about 2 inches long, 1 inch wide and $\frac{1}{2}$ inch high, placed to the left of spectator and below the line of sight, with the end parallel with picture plane. The lid is hinged on the upper left receding edge, and is opened at an angle of about 30 degrees with the upper horizontal edge of the end. [14.]

(c) A book 2 inches long, 1 inch wide and $\frac{1}{2}$ inch thick, placed with back towards observer in an upright position, to the left of him, and above the line of sight. [4.]

3. Draw geometric views (no perspective effect) of the *back*, *side* and *end* of the book above mentioned. Connect the views by dotted lines. Assume the thickness of the boards of the book-cover to be about $\frac{1}{4}$ of an inch. No rulers to be used. [5.]

4. Construct a square 2 inches to a side; on its left upright side, as base, construct an

equilateral triangle; within the triangle inscribe a circle; bisect the lower horizontal side of the square, and from this point of bisection drop a perpendicular 3 inches long and divide the perpendicular into seven equal parts. Show the construction throughout. [10.]

This may be done either with or without compasses and ruler.

Third Class.

HISTORY.

Examiner—Jas. F. White.

1. Write a clear and concise account of the inhabitants of England before and when the Romans arrived. What traces of the presence and influence of the Romans are still to be recognized there? [7+6.]

2. Mention the leading features of the Feudal System. Explain the causes of its decay in England. [5+8.]

3. Narrate the circumstances that led to the assembling of the first English House of Commons. Show how the country had previously been governed. [6+10.]

4. When and by what means did parts of France come under English rule? State how they were severally lost. [7+7.]

5. What was the condition of Education and of Literature in England under the Tudors? [8.]

Name the great English authors of that period and give some account of their writings. [8]

6 Explain clearly what is meant by Responsible Government. Give the history of its establishment in Canada. [13]

7. Write brief notes on the Quebec Act, Abolition of Seigniorial Tenures, Secularization of Clergy Reserves, Expulsion of the Acadians, Treaty of Washington. [15 (3 each)]

PHYSICS.

Examiner—J. C. Glashan.

1. Define *matter, body, solid, liquid, gas*. What is meant by saying that ice, water and steam are three states of one and the

same substance? What is the chief determining condition of each state? [14.]

2. Define *mass, volume and density*, and state the relation that holds among them.

How is the mass of a body generally measured?

A body loses in weight as it is carried from a high to a low latitude; what effect has this on its mass? If the body were to increase in volume while it lost in weight through removal towards the equator what would be the effect on its mass and what on its density? [20]

3. Define *force and energy*, clearly distinguishing between them.

"If it requires a strong force to set a body in motion, it requires also a strong force to stop it."—(Stewart, p. 4.) Show that this is not true.

If a body having a velocity of 60 feet per second be acted upon by no force whatever, what will be its velocity at the end of 5 seconds? [12.]

4. What is the cause of sound? By what experiments could you prove this? [10.]

5. "Rapidly mix some melting ice or some snow and some salt together, the mixture is colder than melting ice." What is the reason of this? [9.]

6. How can you magnify a near object? (Illustrate your explanation by a drawing.)

How can you magnify a distant object? [10.]

Third and Second Class.

MENTAL ARITHMETIC.

Examiner—J. J. Tilley.

Six questions will be considered a full paper. Value 12½ each.

1. When gold is at a premium of 33½ per cent. find the value of \$20 currency.

2. Find the interest on \$600 for 5 years 8½ months at 8 per cent. per annum.

3. Find the price of the carpet 32 inches wide, at \$1 33½ per yard, which will cover a room 24 feet long and 21 feet wide.

4. A mixture of tea at 40 cents and 60 cents a pound, sold at 80 cents a pound and gave a profit of 66⅔ per cent. In what proportion was the tea mixed?

5. A., B. and C. agree to build 50 rods of fence for \$120. After building 20 rods together A. quit, after building 40 rods B. quit, and C. completed the job; how should the money be divided?

6. I sell goods at twice their cost; if they had cost \$30 more the same selling price would have given a profit of only 60 per cent. Find the cost.

7. A person performed a journey at a certain rate of speed; if he had travelled a mile an hour faster he would have accomplished the journey in $\frac{2}{3}$ of the time; but, if he had travelled a mile an hour less, he would have been 4 hours longer on the road. Find the length of the journey.

COMPOSITION.

Examiner—J. E. Hodgson, M.A.

1. Write sentences illustrating clearly the difference between:—ability, capacity; convoke, convene; crime, vice; bring, fetch; hope, expect; counsel, council; hanged, hung. [21.]

2. Correct the following:—

(a) By this means it is anticipated that the time from Europe will be lessened two days. [5]

(b) It was him that Horace Walpole called a man who never made a bad figure but as an author. [5.]

(c) In Jeremy Taylor we find some of the best examples of long sentences which are at once clear and logical. [5.]

(d) The vice of covetousness of all others enters deepest into the soul. [3.]

(e) Observers who have recently investigated this point do not all agree. [3]

(f) Shakespeare the noblest name in literature, was born at Stratford. [3.]

5. Write out in the form of indirect narration the substance of the following extract:—

"Fair dreams are these," the maiden cried
(Light was her accent, yet she sigh'd),
"Yet is this messy rock to me
Worth splendid chair and canopy;
Nor would my footsteps spring more gay
In courtly dance than blithe strathspey,
Nor half so pleased mine ear incline
To royal minstrel's lay as thine.

And then for suitors proud and high,
To bend before my conquering eye,
Thou, flattering bard! thyself wilt say,
That grim Sir Roderick owns its sway.
The Saxon scourge, Clan-Alpine's pride,
The terror of Loch Lomond's side,
Would, at my suit, thou know'st, delay
A Lennox foray—for a day."— [25]

C. Write a short descriptive essay on one of the following subjects:— [30]

(a) Autumn in Ontario.

(b) An out-door sport.

(c) School-life.

(d) The discovery of America.

Third Class.

ARITHMETIC.

Examiner—J. J. Tilley.

1. Define:—Prime number, factor, common multiple, discount, exchange. [5.]

Draw a diagram showing that there must be $30\frac{1}{4}$ sq. yds. in a sq. rod, if the linear rod contains $5\frac{1}{2}$ yards. [4.]

2. A merchant bought 124 yds. of cloth at \$3.62 $\frac{1}{2}$ per yd., and 87 $\frac{1}{2}$ yds. at \$4.12 $\frac{1}{2}$ per yd. At what price per yd. must he sell the whole to realize a profit of 20 per cent.?

Ans. \$4.59 $\frac{1}{4}$. [15]

3. Simplify the following and give the result in £ s. d.—

$\frac{1}{2}$ (3'3 + 1'25) of £1 + $\frac{1}{4}$ of

$$\frac{1'125 - \frac{1}{4} \text{ of } 1\frac{1}{4}}{1\frac{1}{4} \text{ of } 3\frac{3}{4} + \frac{1}{4}} \text{ of } 9s. + \frac{2'16}{2'09}d.$$

Ans. £2 17s. 4d. 1 $\frac{1}{2}$. [15]

4. A farmer sold two loads of wheat, in all 110 bushels for \$94.95. One load was sold at 97 cts. per bushel, and the other at 72 cts. per bushel. How many bushels were there in each load? *Ans.* 47, 63. [15.]

5. A merchant bought cloth at \$2 per yd. and sold the whole at a profit of \$120; had he sold it at 20 per cent. less he would have lost \$96. How many yds. did he buy?

Ans. 240 yds. [15]

6. What will be the cost of insuring a property worth \$47,580 at the rate of $\frac{1}{2}$ of 1 per cent., so that in case of loss the owner may recover both the value of the property and the premium paid? *Ans.* \$420. [15]

7. Divide \$4,941 among A, B and C, so that nine months' interest on A's share at $3\frac{1}{2}$ per cent. per annum, nine months' interest on B's share at $3\frac{3}{4}$ per cent., and nine months' interest on C's share at $4\frac{1}{2}$ per cent. may all be equal. *Ans.* \$182 $\frac{1}{2}$, \$1,701, \$1,417 $\frac{1}{2}$. [15.]

8. I owe a man \$850 and give him my note at 90 days; what must be the face of the note to pay the exact sum, if discounted at $1\frac{1}{2}$ per cent. a month (bank discount)? *Ans.* \$881.87 $\frac{1}{2}$. [15.]

9. A and B engage in trade. A invests \$6,000 and at the end of 5 months withdraws a certain sum. B invests \$4,000 and at the end of 7 months \$6,000 more. At the end of the year A's gain is \$5,800 and B's is \$7,800. Find the amount A withdrew. *Ans.* \$4,000. [15.]

10. (1) If a brick 8 inches long 4 inches wide and 2 inches thick weighs 5 lbs., what will be the weight of a brick of the same material 16 inches long, 8 inches wide and 4 inches thick? *Ans.* 40 lbs. [9.]

(2) The top of a ladder reaches to the top of a wall when its foot is at a distance of 10 ft. from the bottom of the wall, but if the foot of the ladder be drawn 4 ft. farther from the wall the top of the ladder will reach a point 2 ft. below the top of the wall. Find the length of the ladder. *Ans.* 26.92 ft. [12.]

Third Class.

ALGEBRA.

Examiner—J. C. G'ashan.

1. Simplify

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

Ans. $2(a^2 + b^2 + c^2 - bc - ca - ab)$. [8.]

2. Divide $a^4 + b^4 + c^4 - 2b^2c^2 - 2a^2c^2 - 2a^2b^2$ by $a^2 + b^2 - c^2 - 2ab$. *Ans.* $a^2 + b^2 - c^2 - 2ab$. [8.]

3. Multiply $x^{n-3} - x^{n-6} + x^3 - 1$ by $x^3 + 1$. *Ans.* $x^{2n} + 2x^{n-3} + x^{n-6} + x^6 - 1$. [8.]

4. Find the factors of $a^2 - b^2 + c^2 - d^2 + 2ac - 2bd$. *Ans.* $(a + b + c + d)(a - b + c - d)$. [8.]

5. Find the factors of $(a + b)^2 - (b - c)^2 + (c + a)^2$. *Ans.* $2(a + c)(a + b)$. [8.]

6. Simplify

$$\frac{\frac{1}{x} - \frac{2}{x+c} + \frac{1}{x+2c}}{\frac{1}{x} - \frac{3}{x+c} + \frac{3}{x+2c} - \frac{1}{x+3c}}. \text{Ans. } \frac{x+3c}{3c} \text{ [12]}$$

7. Find the value of x that will satisfy the equation $m(x - m) + n(x - n) = 2mn$. *Ans.* $x = m + n$. [10.]

8. Determine x given $4!(x - a)(x - b) - (x - c)(x - d) = (d - c)^2 - (b - a)^2$. [12.]

9. Solve the simultaneous equations $\left. \begin{aligned} \frac{1}{x} + \frac{2}{y} &= 8, \\ x + 2y &= xy. \end{aligned} \right\} \text{Ans. } \left. \begin{aligned} x &= -\frac{1}{2}, \\ y &= \frac{1}{2}. \end{aligned} \right\} \text{ [12.]}$

10. A drover bought 12 oxen and 20 sheep for \$1340; he afterwards bought 10 oxen and 26 sheep for an equal sum, paying \$8 each more for the oxen and \$3 each more for the sheep. What was the price per ox and what the price per sheep of the first lot? *Ans.* \$100 and \$7. [14.]

EUCLID.

Examiner—J. Dearness.

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

1. What is a postulate? [3.]
The postulates permit or ask for the use of the ruler and compass; with what limitations? [3.]

To what class of "Propositions" do the axioms and the postulates respectively correspond? [3.]

2. "A theorem consists of the hypothesis and predicate, and requires demonstration." Explain this statement by reference to two propositions, one of them being "The greater side of every triangle is opposite to the greater angle." (I. 18.) [8.]

3. Draw a straight line at right angles to a given straight line from a given point in the same. (I. 11.) [10.]

4. In the preceding, given the point at the end of the line, draw a line at right angles without producing the given line. (Apply I. 32.) [10.]

5. If from the ends of a side of a triangle there be drawn two straight lines to a point within the triangle, these shall be less than the other two sides of the triangle but shall contain a greater angle. (I. 21.) [12.]

6. In the preceding let ABC be the given triangle, D the given point within it, and AD , CD the lines drawn to D , show that the angle ADC is equal to the sum of the angles ABC , PAD and BCD . [10.]

7. The complements of the parallelograms which are about the diagonals of any parallelogram are equal to one another. (I. 3.) [10.]

8. If the square described upon one of the sides of a triangle be equal to the sum of the squares described upon the other two sides of it, the angle contained by these two sides is a right angle. (I. 48.) [12.]

9. Prove the correctness of these rules :

The area of a trapezoid is equal to half the product of its altitude by the sum of its parallel sides.

The area of a rhombus is equal to half the product of its diagonals. [12.]

10. If a perpendicular (AD) be drawn from the vertex (A) to the base (BC) of a triangle (or the base produced), then shall the sum of the squares on AB and DC be equal to the sum of the squares on AC and BD . [10.]

JUNE EXAMINATIONS, 1885.

High School Entrance.

HISTORY.

Examiner—John Seath, B.A.

NOTE.—75 marks constitute a full paper. A maximum of 15 marks may also be allowed for composition, and of 5 for writing and neatness.

1. Give an account of the coming of the English into Britain. [10.]

2. State the causes and results of the Wars of the Roses. [10.]

3. Show that Elizabeth's reign marked the beginning of a new state of things in England. [10.]

4. Outline the course of the English Revolution, stating its causes and its results. [10.]

5. Sketch the career of William Pitt, the elder. Describe the condition of England when he was at the head of her affairs. [6+6]

6. Name the wars of England which directly concerned her North American colonies. Give an account of any one of them. [5+8.]

7. Show the truth of the statement that England and Canada are now governed by the people. Show also that this has not always been the condition of matters. [5+15.]

8. What makes an event or a person important in the history of a nation? Why is each of the following important in the history of the English nation:—Hamden, Henry VIII, Wilberforce, Chaucer, the Treaty of Paris, and the French Revolution. [3+6×2=15.]

COMPOSITION.

Examiner—J. E. Hodgson, M.A.

NOTE.—70 marks constitute a full paper. A maximum of 5 marks may also be allowed for neatness and writing.

1. Combine the following elements so as to form complex sentences:—

(a) Parrots abound in the forests of South America. In these forests there is summer all the year round. In these forests the leaves are always green. In these forests the flowers are always blooming.

(b) The bison is found in North America. The bison is also found in the northern parts of Europe and Asia. In America the bison is commonly, but erroneously, called the buffalo. [16.]

2. Express in your own words the meaning of the following:—

(a) I dare do all that may become a man; Who dares do more, is none.

(b) All alone by the side of a pool
A tall man sat on a three-legged stool,
Kicking his heels on the dewy sod,
And putting together his reel and his rod.

(c) Only in sleep shall I behold that dark eye
glancing bright;
Only in sleep shall hear again that step so
firm and light;

And when I raise my dreaming arm to check
or cheer thy speed,
Then must I, starting, wake to feel—thou'rt
sold, my Arab steed. [28.]

3. Write a letter to a friend, describing
how you spent Arbour day, or the Queen's
birthday. [15.]

4. Correct the following :—

(a) He is seldom or ever here.

(b) Has either of your three friends arrived?

(c) I shall neither depend on you nor on
him.

(d) Neither riches nor beauty furnish peace
and contentment.

(e) Our mutual friend arrived yesterday.

(f) The winter has not been as severe as
we expected it to have been. [17.]

5. Expand the following sentence into a
paragraph :—

William Tell, the Swiss patriot, having
pierced with an arrow the apple placed (for
a mark) upon his son's head by the Austrian
tyrant, dropped a second arrow; and being
asked its purpose, replied that it should have
found the tyrant's heart, if he had harmed
his son. [14.]

ENGLISH GRAMMAR.

Examiner—John Seath, B.A.

NOTE.—100 marks constitute a full paper.
A maximum of 5 marks may also be allowed
for neatness and writing.

1. (1) *Still* in thy *right* hand *carry* gentle
peace,
To silence envious tongues.

(2) *In* Islington there *was* a man
Of *whom* the world might say
That still a godly race he ran—
Whene'er he went to *pray*.

(a) Classify each of the foregoing sentences.
[4.]

(b) Classify each of the clauses (or propo-
sitions). [2 × 5 = 10]

(c) Analyze the predicate of (1). [4.]

(d) Parse each of the italicized words.
[2 × 8 = 16.]

2. *Government, Person, Number, Mood.*

Explain the meaning, or meanings, of each
of the foregoing terms, illustrating your
answer by reference to the following sen-
tence :—

Thou shalt see him. [8.]

3. Construct sentences to show that each
of the following words may be used as dif-
ferent parts of speech :—

where, iron, English, no. [8.]

4. Pluralize—

*sheep, fish, cargo, negro, Mr., Madam, Miss,
money.* [8.]

5. Give the other gender forms of—

*Governess, hunter, murderer, witch, author,
calf.* [6.]

6. Write out the verbs in the following
sentence, giving the reason in each case for
your classification :—

*Having risen I went to the window where
he had been, and I saw him try to jump off
after speaking to the conductor.* [6.]

7. Give the other principal parts of—

done, sung, singe, spread. [6.]

8. Express in as many ways as you can
different degrees of each of the following :—
handsome, magnificent, best, badly. [8.]

9. Distinguish—

*The crowd was in the street and The
crowd were in the street, Thou art my friend
and You are my friend, You will write and
You shall write, John's and James's book
and John and James's book, and He divided
it among them and He divided it between
them.* [2 × 5 = 10.]

10. Correct, where necessary, the follow-
ing, giving the reason in each case :—

(a) What kind of a person is your teacher?

(b) Every one should be guided by their
own consciences.

(c) I had no idea but what he had been
and gone and done it.

(d) He comes when more than one is
present.

(e) So much grace and beauty are seldom
seen.

(f) Her intelligence as well as her beauty
surprises me.

(g) I hoped to have seen him.

(h) The fire burns bright.

(i) Not only Persia but all Asia felt his
power.

(j) You wouldn't hardly think so. [3 × 10 = 30.]

ARITHMETIC.

Examiner—J. E. Hodgson, M.A.

NOTE.—100 marks constitute a full paper. A maximum of 5 marks may be added for neatness and writing.

1. Express in words:—17089653 005904, \$705'637, and MDCCCLXXXV. [9.]

2. Simplify:—

$$47 \left(3\frac{1}{2} + 9\frac{1}{4} \right) \div 1\frac{1}{2} \text{ of } \frac{\text{£}15 \text{ 10s. 2d.}}{16\text{s. 2d.}} \quad [8.]$$

3. Find the value of $17.654 + 4.835 + 6.408$ [12.]

4. Make out a bill of the following goods:—

23 yds. cotton @ 11c. ; 13 yds. gingham @ 23c. ; 25 yds. flannel @ 37c. ; $18\frac{1}{2}$ yds. tweed @ \$1.50 ; $12\frac{1}{2}$ yds. serge @ \$1.75 ; $6\frac{1}{2}$ yds. broadcloth @ \$4.50. [16.]

5. A merchant purchases sugar at \$7.50 per cwt ; at what price per lb. must he sell it in order to gain 10 % ? [10.]

6. Find the simple interest on \$167.00 for 3 yrs. 9 mos. at 7 % per annum. [12.]

7. In what time will any sum of money double itself at 6 % simple interest ? [10.]

8. \$1200 is to be divided between two persons, A & B, so that A's share is to B's share as 2 to 7. [12.]

9. At what two times between three and four o'clock are the hands of a watch equally distant from the figure III. ? [16.]

10. A man having \$720 spends a part of it, and afterwards received $7\frac{1}{2}$ times as much as he spent ; he then had \$1305. How much did he spend ? [15.]

GEOGRAPHY.

Examiner—J. E. Hodgson, M.A.

NOTE.—75 marks constitute a full paper. A maximum of 5 marks may also be allowed for neatness and writing.

1. Define equator, tropic, horizon, glacier, water-shed. [5.]

2. What and where are the following: Prince Albert, Callender, Soudan, Khartoum, Herat, Cyprus, Quito. Battleford ? [16.]

3. Name the principal cities and towns of Ontario (a) on the main line of the Grand

Trunk Railway, (b) on the main line of the Canadian Pacific Railway. [14.]

4. Draw an outline map of the western peninsula of Ontario, and on it indicate the principal rivers, cities, and towns. [16.]

5. Name two of the principal productions of each of the provinces of Canada. [10.]

6. Trace the chain of the great Canadian lakes and the course of St. Lawrence and Ottawa rivers. [12.]

7. State the boundaries of the following countries:—Egypt, Russia, France, Brazil, United States of America. [17.]

ORTHOGRAPHY AND ORTHOEPY.

Examiner—J. E. Hodgson, M.A.

NOTE.—25 of the 50 minutes allowed for this subject are to be allotted to A, which is to be read to the candidates three times. At the end of 25 minutes, the Presiding Examiner will distribute B among the candidates, who will, after writing their answers, fold them and hand them in with their work under A.

A.

With the instinct of despotism he had seen that the real danger which menaced the new monarch, lay in the tradition of the English Parliament ; and though Henry had thrice called together the houses to supply the expenses of his earlier struggles with France, Wolsey governed during eight years of peace without once assembling them.

A man of lax principles lacks character.

We must bow as we pass under the bough of that tree.

Wait till I am weighed.

Asiatic, conjugation, neuter, economy, hygiene, changeable, seizure, received, believed, rebel, separate, campaign, hypocrisy, nonsense, development. Value, 32.

B.

Indicate fully the pronunciation of the following words:—Massacre, towards, truths, heroism, gridiron, beneath, peril, pearl, geography, horizon history, forbade, cleanly (adj.), cleanly (adv.).

Accentuate the italicized words in the following sentences:—

Their accounts of the *conflict conflict* with each other.

The very dogs *refuse* to eat the *refuse* you offer them. Value, 18.

WRITING.

1. Write each of the following letters, or combinations of letters, three times:—

l, u, m, ch, sp, w, A, W, H, Q. [10.]

2. Write the following stanza:—

The curfew tolls the knell of parting day,
The lowing herd wind slowly o'er the lea,
The ploughman homeward plods his weary way,
And leaves the world to darkness and to me. [5.]

DRAWING.

Examiner—John Seath, B.A.

NOTE.—25 marks constitute a full paper.

1. Draw a horizontal line 1 inch long, by the judgment of the eye alone. Indicate its division into half inches by a short upright line; the division of the half inches into quarter inches by shorter upright lines; and the division of the quarter inches into eighths of inches by faint dots placed on the line. [4.]

2. Draw two horizontal lines across your paper, about 1 inch apart. Beginning at the left, lay off towards the right, an oblong 2 inches in length; skip $\frac{1}{2}$ inch, and lay off a square; skip $\frac{1}{2}$ inch and lay off an oblong 3 inches in length. [15.]

(a) Within the first oblong draw the outline of a portion of any picket fence.

(b) Within the square, draw the side view of a tea cup. Place the handle on the right side of the cup and draw two horizontal borders, each $\frac{1}{2}$ inch wide, across the cup—one near the top, the other near the bottom.

(c) Within the second oblong draw a border, composed of a four-pointed star repeated three times horizontally.

3. Draw a circle two inches in diameter, and within it draw *one* of the following:—An octagon, a hexagon, two interlacing equilateral triangles, the interlacing bands being $\frac{1}{2}$ inch wide. [8.]

4. Draw the following:—

(a) An oval, having its diameters respectively 1 and 2 inches—the longer diameter being horizontal.

(b) An ellipse, having its diameters respectively 1 and 2 inches—the longer diameter being horizontal.

(c) A clover leaf, using the diameters of the oval as construction lines. [10.]

N.B.—The ruler may also be used, if necessary, to draw the long horizontal lines across the paper in question No. 2, *but for no other purpose.*

ENGLISH LITERATURE.

NOTE.—100 marks constitute a full paper. A maximum of 15 marks may also be allowed for composition, and of 5 marks for writing and neatness.

Ontario Readers.

1. GOD bless her! wheresoe'er the breeze
Her snowy wing shall fan,
Aside the frozen Hebrides,
Or sultry Hindostan!
Where'er in mart or in the main, 5
With peaceful flag unfurled,
She helps to wind the silken chain
Of commerce round the world!
Speed on the ship!—but let her bear
No merchandise of sin, 10
No groaning cargo of despair
Her roomy hold within;
No Lethean drug for Eastern lands,
Nor poison-draught for ours;
But honest fruits of toiling hands
And Nature's sun and showers!

(a) What is meant by calling the poem to which these stanzas belong "A Song of Labour?" [3.]

(b) Explain "snowy wing," "shall fan," and "aside." [2 × 3.]

(c) Why does the poet mention "the frozen Hebrides" and "sultry Hindostan," and "mart," and "main?" [4.]

(d) Distinguish "mart" and "market," and "main" and "sea." [2 + 2.]

(e) What is meant by calling the *flag* "peaceful?" [3.]

(f) What is "the *chain* of commerce?" Why is it called "silken," and how can the ship help to wind it? [3 × 3.]

(g) How is l. 10 connected in sense with what follows? [4.]

(h) Explain the meaning of each of the following expressions, bringing out the full force of the italicized words:—"Speed on the ship!" "groaning cargo of *despair*," "*Lethean* drug," "poison-draught," "*honest* fruits." [2 × 5.]

(i) What synonym does Whittier use in the poem for "Eastern lands?" How does he explain in the next stanza ll. 15-16? [3+4.]

(j) Name the emphatic words in ll. 1, 3, 4, 9 and 15, and show where the pauses should be made in ll. 5-9. What feelings should we express in reading these stanzas? [4 × 3.]

(k) What lessons, for our guidance in life, may we learn from "The Shipbuilders?" [6.]

2. There was a frankness in my uncle Toby—not the *effect* of familiarity, but the *cause* of it—which let you at once into his soul, and showed you the goodness of his nature. To this there was something in his looks, and voice, and manner superadded, which continually beckoned to the unfortunate to come and take shelter under him; so that, before my uncle Toby had half finished the kind offers he was making to the father, the son had insensibly pressed up close to his knees, and had taken hold of the breast of his coat, and was pulling it towards him. The blood and spirit of Le Fevre, which were waxing cold and slow within him, and were retreating to their last citadel, the heart, rallied back! The film forsook his eyes for a moment; he looked up wistfully in my uncle Toby's face, then cast a look upon his boy. And that ligament, fine as it was, was never broken!

Nature instantly ebbed again—the film returned to its place—the pulse fluttered—stopped—went on—throbbed—stopped again—moved—stopped. Shall I go on? No!

(a) Give for each of the following a meaning which may be put for it in the foregoing passage:—"Frankness," "not the *effect* of familiarity, but the *cause* of it," "let you at once into his soul," "superadded," "beckoned to the unfortunate to come and take

shelter under him," "wistfully," "waxing," "Nature instantly ebbed again." * [2 × 8.]

(b) Explain the use in the third sentence of "were retreating," "last citadel," and "rallied back," in reference to blood and spirits. [4.]

(c) What did the father and the son mean by acting as they did? [3+3.]

(d) Explain the meaning of "That ligament, fine as it was, was never broken." [4.]

(e) Account for the punctuation of the sentence beginning with "Nature" and ending with "stopped." Distinguish the meanings of "fluttered," "throbbed," and "moved." [3+3.]

(f) Why does Sterne answer his question thus? [3.]

3. Quote from the lessons you have memorized, a passage containing one or more noble thoughts. [8.]

4. Reproduce in prose "The Incident at Ratisbon." [15]

ADMISSION TO HIGH SCHOOLS.

Notes on Literature.

SIR JOHN FRANKLIN.

Sir John Franklin was a famous Arctic explorer who set out in 1845 to search for a North-West Passage round the coast of North America. He never returned, and, though many expeditions were sent out in search of him, no trace of his party was discovered till 1858, when McClintock found a cairn on King William Island containing a box of papers. From these it was learned that Franklin had died on board his ship, while the crew had gone on to seek open water. Other traces of the party were met with by later explorers till at last no doubt was left that all had perished.

"A moment and no more."—But very little could be learned from the papers found.

"Willing."—Knowing. The correct form of the present participle is "witting."

* In answer to this question, the candidate should write down simply the expressions he proposes to substitute, without making any further explanation.

"*River of their hope.*"—The long-wished-for open water.

"*Snow-blind.*"—The glare of the snow in Arctic regions frequently causes what is known as snow-blindness.

"*Iron-strand.*"—Hard as iron, frozen, cold.

"*His heart,*" etc.—Franklin died on board his ship, and thus was spared the pain of seeing his sailors suffer, while they knew that he had breathed his last in comfort, and so were glad that he had not to endure their misery.

"*Punch.*"—A famous comic paper, published in London. This poem appeared in 1859, shortly after the news of Franklin's fate was received.

THE SHIP-BUILDERS.

John G. Whittier.—An American poet, born in 1807. He took a prominent part in the struggle for the Abolition of Slavery, both by writing and speaking. He has written several ballads; also, the *Legends of New England, Maud Muller, Justice and Expediency.*

"*Fading with the stars.*"—Morning is just dawning as appears from the first four lines.

"*For us the smith,*" etc.—The smith must provide the iron parts of the ship to be used by the builders. Note also in the next stanza how the wood is procured.

"*Island barges.*"—Large rafts of timber like floating islands carried down by the stream.

"*Century-circled oak.*"—The oak is said to require a hundred years at least to reach its full height. Each year adds a fresh ring to the wood.

"*Tree-nails.*"—The long wooden pins used in fastening the planks to the sides of a vessel.

"*Keel.*"—The lowest part of a ship.

"*Vulture-beak.*"—The sharp northern ice compared to a vulture's beak. The great danger to ships in the Polar seas is from the masses of ice from which, if once surrounded, escape is well-nigh impossible.

"*Coral peak.*"—Many of the islands of the Pacific are formed by coral insects. These

insects work slowly but surely, till just as the heap of coral reaches the surface of the water they can work no longer. After a while land is formed on the coral foundation, but this takes time, and meanwhile this coral, so near the surface of the sea and yet concealed from sight, is very dangerous to vessels. Notice the contrast in these lines between "Northern ice" and "coral peak," as if the poet would say: "Our ship may travel the wide world over."

"*Citadel.*"—Fortress. The sailor's defence from the waves.

"*Snowy wing*"—White sail.

"*Frozen Hebrides.*"—Note the exaggeration, also the contrast, again brought out by the mention of "sultry Hindostan."

"*Silken chain of commerce.*"—Commerce unites nations in a pleasant, friendly way.

"*Groaning cargo,*" etc.—Cargo of slaves. The slaves were packed closely together on what was called a "slave-deck" in the hold.

"*Lethean drug for Eastern lands.*"—Opium for China. Lethe was, according to the Greeks, a river in Hades, the taste of whose waters produced entire forgetfulness. Opium stupefies; hence it is called a "Lethean drug." The Chinese eat this drug in great quantities, and great profit came to Hindostan through the trade. When the Chinese Government wished to put a stop to it England declared war and compelled them to permit the trade.

"*Poison-draught.*"—Intoxicating liquors.

"*Golden grain.*"—Why is the grain called "golden"?

"*Desert's golden sand.*"—Gold dust, found generally in desert places.

"*Clustered fruits.*"—Probably grapes.

"*Morning land.*"—Eastern land; where the sun appears to rise. Spices are procured in great quantities from the East Indies.

NUMBER AND ARITHMETIC.—I.

YOU have found out by the most careful examinations just what each child knows of number; that is, just what limitations by ones your pupils can easily and readily make, and what they know of the relations

of the numbers in the largest number they can mentally grasp as a whole. Now begins the real work of teaching number. We will suppose that your pupils know three; then begin with four.

USE all the objects possible in teaching a number, that are of immediate use to children. Keep this truth distinctly and fully in your mind, at whatever stage of number or arithmetical teaching your pupils may be: all knowledge of number is absolutely founded upon the limitations of things by ones, and that these limitations must be made by the learners for and by themselves. These limitations by ones must be made at first with objects, after which they can be made without the presence of objects, but the mental object is precisely the same with or without objects. Either the objects themselves must be before the learner, or the subject-objects so clearly in the mind that the presence of objects are not necessary to the right mental action. In the latter case the presence of objects *weakens mental action*.

SUGGESTIONS for teaching four.—*The number as a whole.* Teacher—Show me four blocks, four shells, four pebbles, four shoe-pegs, four leaves, four flowers, four animals, four lines (in forms), four sides, four corners, four squares, cubes, triangles, oblongs, edges, pictures, panes of glass, trees, bushes, fingers, boys, girls. Have pupils make inch, foot and yard measures out of pasteboard or wood. Have them hold a foot measure in one hand, and draw parallel lines a foot long on the blackboard. Have them draw four vertical, then four horizontal and four oblique lines, testing lengths with their measures. Draw one line four feet long and test it with the foot rule. Do the same with the inch measure. Have pupils make inch and foot squares out of pasteboard or wood, and draw them as they did the linear measures. Draw four squares in an oblong; make longest sides horizontal; make them vertical. Make the sides equal (a square). Have pupils arrange the square inches in different forms by drawing them.

FORM, colour, and number may be taught together, to great advantage, in teaching number. Paper-folding is an excellent means of teaching form, colour and number at the same time. Use linear, square and cubical measures at every step. It is a good plan to have all the geometrical forms made in wood and variously coloured. Have pupils show four blue cubes, four red squares, four yellow triangles, four green oblongs, four red rhomboids, four orange balls or spheres.

TEST the sense of hearing by rapping four times on the table, stamping four times, tapping a bell four times, etc. Have pupils do the same. Test the sense of touch by having pupils close their eyes and taking fours of things from the table. Have pupils find fours of objects around them, in nature and art. They will discover that a dog has four legs; a waggon, four wheels; a pane of glass, four edges; etc.

WHEN a distinct concept of four, is in the mind begin the analysis. Teacher—Tell me what you can find in four. (Different kinds of objects should be on a table or desks.) Pupil—I see two blocks in four blocks. Teacher—Show me the two blocks that you have found in four blocks. Teacher—How many twos can you find in four blocks? It is difficult to imagine the answers of children. They may be very slow in saying, “there are two twos in four.” Teacher—How many twos have I in my hand? Pupil—One two. Teacher—How many twos on the table? Pupil—One two. Teacher—Now, how many twos are there on the table? Pupil—Two twos (perhaps). When a child discovers the twos in four, what has he discovered? $4 \div 2 = 2$; $2 \times 2 = 4$; two 2's = 4; $4 - 2 = 2$, and he can easily infer that $\frac{1}{2}$ of 4 = 2. Teacher—How many twos did you find in four blocks? Find two twos in four shoe-pegs, four squares, four marks on the board. Make four marks on the board so that I can see the two twos. Draw four birds. How many twos make four? Show me with lines, squares, cubes, etc. Who

can say two twos another way? Two and two are four (perhaps). Teacher—If I had two cents in one hand and two cents in the other how many cents would I have in both hands? Teacher—Sarah, please take four beans, and give Mary two beans, how many beans have you now? Give Sarah what you have; how many did you give her? How many has she now? Find something else in four. Facts in four, $4 \div 2 = 2$; two 2's = 4 ; $4 - 2 = 2$; $3 + 1 = 4$; $4 - 3 = 1$; $4 - 1 = 3$; $\frac{1}{2}$ of $4 = 2$. The facts, $4 \div 2$ (twos in four) and $\frac{1}{2}$ of 4 are identical in the minds of many teachers. Children will never confuse these two decidedly different operations, if the teacher does not. They probably know

one half of four. Teacher—Give me one half of four blocks; give me the other half; how many halves have I now?

GIVE pupils a great many little problems and have them make problems for themselves. Teacher—Who has a question, or who will be the teacher? For reviews.—Show me all you can do with four books. Tell me what you have done. What can you do with four squares? Be very careful about the language. Do not force new and unintelligible idioms upon them. You may use the new terms and idioms yourself, but allow the pupil to tell what he does in his own way.—*Exchange*.

CONTEMPORARY LITERATURE.

ADVANCE copies of a new text-book on Geography, compiled by Mr. W. C. Campbell, and published by Mr. C. Blackett Robinson, are probably already in the hands of many of our readers. Great attention has been paid to the maps, illustrations and typography; a special feature in regard to the map of Canada being the careful marking of the height above sea-level of the various lakes, etc. Scholars and teachers will find the book worthy of their earnest consideration.

OUR EXCHANGES.

Canada has reason to be proud of such denominational papers as the *Christian Guardian*, the *Canada Presbyterian*, the *Canadian Baptist*, the *Churchman*, and the *Canada Methodist Magazine*. The *Presbyterian Review*, too, is now added to the list, while no doubt the *Queen's College Journal*, the *Knox College Monthly* and the *V. P. Journal*, are training editors and contributors for the "Guardians" and "Churchmen" of another generation. May "the mantle" fall on broad shoulders.

WORDS of appreciation and praise are hardly necessary in speaking of the *Sunday School Times*, of Philadelphia. The editorial page often contains helpful and inspiring thoughts.

THE *New England Journal of Education* (Boston) is worthy of that cultured city and will compare favourably with any of its contemporaries.

OUR esteemed contemporary, the *School Journal* (New York) is now in its fifteenth year. We take the liberty of complimenting the editor on the good sound common sense and right feeling which is shown in the notes on the first page.

THE *Index*. An independent educational journal which pays much attention to current literature.

THE *School Herald* (Chicago). Intended to be used as a summary of general news and events of special importance to the teachers of the United States.

THE *American Journal of Education* (St. Louis). A patriotic teachers' paper, with a formidable array of editors, which offers several premiums to its subscribers.

THE *Pupils' Companion* (New York) is an ably-conducted little paper, which contains supplementary reading for children at school.

THE *Normal Teacher* (Indianapolis) is a paper which pays special attention to school-room work.

THE *School Bulletin* (Syracuse, N.Y.) with its current history, query box, articles on educational topics, and literary department, is, we are sure, highly valued by its patrons. A special feature is the attention paid to the conventions of school officers, etc.

THE *Central School Journal* (Keokuk, Iowa) always contains interesting paragraphs relating to schools and other matters.

THE *Educational Record* (Province of Quebec) is a regular and much prized visitor. Like its neighbour—the *Journal de l'Instruction Publique*, it is well adapted for a teacher's use.

THE *Fountain* (York, Pa.). An unpretentious little magazine, designed to furnish good reading for children, in and out of school. Another favourite in the same field is the *Home and School Visitor* (Greenfield, Iowa).

THE *Penman's Gazette*. A readable paper, specially designed for book-keepers, accountants, etc.

THE *Teacher*, (Philadelphia), is clearly printed on good paper, which cannot be said of all educational journals. The articles, both original and selected, are often valuable.

THE *American Teacher* (Boston) is noted for its model lessons, and other hints and helps for class-room work.

THE *Educational Courant* (Louisville, Ky.) contains good reading, both in the contributors' department and in the selected articles. The *Courant* deserves the thanks of the profession for its courageous remarks about the "new education," in which "system" there is great reason to fear that some truth is carefully hidden away under much rubbish and general personal glorification of the "new educators" themselves.

THE *Pennsylvania School Journal* (Lan-

caster, Pa.). This important magazine is the official organ of the State Teachers' Association. A recent number contained some extracts from Inspector Scarlett's admirable address to the students of a county model school, which our readers no doubt remember.

THE *Texas Journal of Education* (State Official Organ). A good teacher will derive much pleasure and not a little assistance from the pages of this journal.

THE *Indiana School Journal* (Official Organ) continues to maintain all its departments with energy and success.

THE *Wisconsin Journal of Education* is carefully edited, and is the official organ, not only of the teachers but also of the Department of Public Instruction. The contents are varied and useful.

THE *South-Western Journal of Education*, (Nashville, Tenn.) represents no less than twelve states, each of which has a separate department,

Our valued contemporary has a handsome appearance and evidently possesses a large and well-organized staff. It is worthy of the people who, "in poverty and defeat," set themselves to the long, hard task of educating, not only their own children, but a whole race of grown up children. In their success, they have the sympathy of many who have never even seen "Dixie's Land."

Education. (The New England Publishing Co. : Boston).

A high-class magazine, published bi-monthly, containing educational articles of great value.

THE *Mechanical and Milling News* (Toronto) is devoted to the interests of mechanics and mill-owners throughout the Dominion and seems to be conducted with much energy and success.

THE pages of the *American Inventor* (Cincinnati) are exceedingly interesting and there are few issues that do not contain something which will well repay perusal.

THE last addition to our list of exchanges is very welcome, being the *Manitoba and North-West Monthly* (Winnipeg), with a

sensible, loyal, independent and moderate platform, both in regard to "New Canada" and the Province from which "New Canada" has been peopled. The first number certainly promises well.

RECEIVED.

"CATALOGUE of the first exhibition of Canadian Etchers."

"LETTER addressed on behalf of the London Music Publishers' Association to Sir Charles Tupper on the subject of the Canadian Law of Copyright."

"SELECT Spelling and Pronouncing Lessons from Appletons' School Readers."

ORGANIC CHEMISTRY. By Prof. Remsen. (Boston: Ginn, Heath & Co).

THE CANADIAN BEE JOURNAL. (D. A. Jones & Co. Beeton, Ont).

"RAPPORTS sur l'Instruction Publique en Belgique." (By the courtesy of the Belgian Consul-General in Canada.)

LEONARD AND GERTRUDE. Translated and abridged by Miss Eva Channing. (Boston: Ginn, Heath & Co).

KRUSI'S DRAWING TABLETS. (Ruled in $\frac{1}{4}$ inch spaces.) To accompany Krusi's easy drawing lessons and the synthetic drawing course. (New York: Appleton & Co.)

THE SCHOOL BULLETIN YEAR BOOK. For the State of New York for 1885. (Syracuse: C. W. Bardeen.)

NOTES.

A TIMELY hand-book, "Our Volunteers in the North-West," has lately been issued from the office of the Ottawa *Free Press*. It is compiled by Captain H. G. Dunlevie.

Shakespeariana, an original American magazine, published only by the Leonard Scott Co., of Philadelphia, is issued monthly, not bi-monthly, as stated in our April number.

GINN AND COMPANY, Boston, announce to be ready about the 1st August, First Steps in Latin, and Language Lessons in Arithmetic, Andreas, Questions on Cæsar and Xenophon.

THE Montreal *Gazette*, with characteristic enterprise, has secured for three years the control of the official statistics and other information compiled by the Montreal Corn Exchange Association.

SIX new books are announced for early issue by Messrs. Ginn & Co., of Boston. "School Hygiene," "Outlines of Practical Philosophy," "A New High School Music Reader," "Stories for Kindergarten and

Primary Schools," "Studies in General History," and "A Hand-book of Poetics."

DR. HODGINS, treasurer of the Ryerson Memorial Fund, states that the schools of the County of Peel contributed, through Mr. D. J. McKinnon, Inspector, the sum of \$85.58 towards the memorial for the founder of our educational school system. All the schools in Ontario should have at least a "brick" in this undertaking.

THE Ontario Teachers' Association will hold its twenty-fifth Annual Convention in Toronto, commencing August 11, and continuing over the two days following. The growing importance of these annual conventions in their useful results to teachers has on all hands been conceded, and judging by the programme and the ability of those who are to read papers upon the various subjects, the convention this year will be especially interesting to the profession and to all others as well who give any considerable attention to our Public School system and the methods by which it is applied. Arrangements have been made with the several lines of railway

for reduced fares to those attending the above meeting.

AT the recent closing exercises of the McGill Normal School, Montreal, Prof. McGregor delivered the address to the graduates on behalf of the school. He reminded them that the pleasure of teaching was not the least perquisite of the task they were about to undertake, and were it not for this love of teaching for its own sake it was doubtful whether so many would labour at it for such poor remuneration. The certificates they had just received should be regarded as a pledge of what was to be done in the future. Dr. McGregor, referring to the North-West rebellion, urged upon the teachers the necessity of inculcating the spirit of patriotism into the minds of their pupils. He concluded by advising them always to remember the Normal School and endeavour to do it credit.

HAS not the time come when we ought, at least, to begin thinking about the feasibility and utility of having in this Province one or more artisan High Schools? The present course of training in High Schools is good; but very different from what the mechanic mostly requires. The drawing classes are a step in the right direction, but they do not "fill the bill." Other schools for agricultural training are also a necessity. In counties containing two or more High Schools, at least one of these institutions might be set apart for teaching of the one kind or the other. As preparatory to the School of Practical Science, and to the Agricultural College, some such places are as much required as are High Schools to the University.

THE PROVINCIAL MODEL SCHOOL.—It is doubtless the intention that this institution should be exactly what its name purports—a model. It may be that in the matter of methods and discipline the school is all it ought to be, but what about the prize system? Does the Department wish the teachers who are conscientiously opposed

to prize-giving, to understand that their objections are trivial or unfounded? Surely if the prize system is so good that it is retained to such an extent in the Model School, teachers who have discarded it elsewhere have committed a serious mistake. It will not be easy to convince a good many that the giving of prizes is anything but vicious.

UNIVERSITY OF TORONTO MATRICULATION EXAMINATION.—At the recent examination 198 candidates presented themselves, exclusive of seventy-one who attended the local examinations. Twenty-one of the 198 are ladies. The following educational institutions sent up candidates:—Knox College, Bishop Strachan School, St. John's College, Winnipeg; Albert College and Trinity College School, one each; Pickering College 2; Wycliffe College 4; St. Michael's College and Woodstock College 6; Upper Canada College 15; Albert College 1; Collegiate Institute, Toronto 16; Galt 11; St. Mary's 10; St. Catharine's 9; Hamilton 7; Barrie 6; Whitby and Brantford 5 each; London, Perth and Collingwood 4 each; St. Thomas, Stratford and Ottawa 3 each; Coburg 1; High Schools, Uxbridge 7; Strathroy, Bradford, Clinton and Belleville 6 each; Orillia, Walkerton and Harriston 4 each; Weston, Richmond Hill, Bridgetown, Orangeville and Newmarket 3 each; Port Hope, Bowmanville, Oshawa, Brampton, Berlin, Port Rowan, Guelph and Woodstock 2 each; Oakville, Seaforth, Aylmer, Welland, Owen Sound, Goderich, Mount Forest, Almonte, Brockville, Picton, Petrolia, Ingersoll, Brighton, Simcoe and Port Dover 1 each; Private Study 5. The seventy-one who presented themselves for the local examinations are divided among the following: Brantford Ladies' College, Whitby Ladies' College, Fergus, Guelph, Petrolia and Streetsville High Schools, and Galt and Toronto Collegiate Institutes. The scholarships have been awarded in this order: Mr. Cody, Galt, 4 scholarships; Toronto C. I. 3; Barrie 2; Upper Canada College 2; Collingwood 1.