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THE CANADA EDUCATIONAL MONTHLY.

THE CANADA
EDUCATIONAL
MONTHLY.

AND

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THE CANADA

EDUCATIONAL MONTHLY

AND SCHOOL MAGAZINE.

JANUARY, 1892.

THE RELATION OF THE PUBLIC SCHOOL TO NATIONAL LIFE.*

BY REV. W D ARMSTRONG, M.A., PH.D., OTTAWA.

LADIES sometimes exhibit marvellous skill in making over an old dress or bonnet, and by the adroit addition of a ribband or a rose make it look just like a new one, and in it they are sweet, attractive, irresistible. Just such skill I would like to possess for the theme I have chosen. I would like to so freshen it that you would find it attractive and that it might win your approval and loving embrace. It is told of a preacher who having floundered away for half an hour with a great theme and conscious of his failure concluded: "Well, brethren, I have given you a very poor sermon but the text was grand." You will admit that my text is a grand one, my theme one of vital importance. The very *raison d'être* of our public schools is involved in it, for do they not exist because of their presumed beneficial influence on the national life?

My theme is also a timely one. We have not yet forgotten the great Parliamentary investigations of last

summer. The thunder of that storm is still re-echoing in Quebec and elsewhere. Every thoughtful Canadian was, and is, asking the question, What can be done to heal the hurt of our nation? What can be done to take the brand of shame from the brow of fair Canada? What can be done to staunch the wound through which her life blood is streaming? It is not enough that an evil has been discovered. It is not enough that the evil doers have been or shall be punished. Healing salt must be thrown into the very spring of public life.

Have the public schools and the public school teachers anything to do in this great work? We propose to answer this enquiry. A primary question is, what is the aim of education in our public schools? Is it political?

Dr. Toqueville has given us this verdict: "In the United States politics are the end and aim of education; in Europe the principal object is to fit men for private life." We presume that the severity of truth is somewhat sacrificed here to the balance of the

* Delivered before the Ottawa Teachers' Association, November, 1891.

sentence, but the distinction drawn is worthy of notice. Our idea of the place of the public school is similar to that in the United States.

Shall we say then that education in this country should have politics for its end and aim? I answer yes. But what politics? Surely not party politics, electioneering, office-seeking politics, but politics in the higher, truer sense—the politics that mean patriotic statesmanship—that mean the duties and obligations of true citizenship.

What product do we seek from our public schools? I answer, good, intelligent, profitable citizens. The welfare of the State demands this. But what constitutes a citizen—a good citizen—in a free country?

I think there are three requisites necessary to make a good citizen.

1. In the first place it is necessary that he should be competent to cast his vote under free institutions. In this country we have free institutions, but it is our misfortune to have a host of incompetent voters. What are the requisites of a competent voter?

I answer, in the first place, sufficient intelligence. It is monstrous that a man ignorant of the issues before him should vote on those issues. It is monstrous that a man ignorant of the meaning of free institutions, ignorant of the essential facts in the political sphere in which he lives, and unable, it may be, to read and inform himself, should have a vote in determining the destinies of the nation.

2. Not only should a voter have sufficient intelligence, but to be a competent voter he must be free. The man whose will is not his own, who voluntarily or involuntarily submits to the dictation of another, has no right to cast a vote. He is not a free person. I care not whether the dominating power have an ecclesiastical or civil, an economic or a social origin; the man who in voting is not

expressing his own will should not be permitted to vote.

3. Further, I hold that to be constituted a true voter a man must not only be intelligent and free, but he must have a stake in the country, an interest in it and in its welfare. Property may furnish but a rough standard but it is better than none. A vast amount of work must be done by the church and the schools before universal suffrage ceases to be a menace to the stability of government.

When any doubtful person comes before a court to give testimony, the question is asked him, Do you know the nature of an oath?

I would have the question put to many a man when he comes forward to ask for his ballot, "Do you know the meaning of a vote?" and if he cannot answer the question intelligently, and tell why and wherefore he casts his vote, I would dismiss him as incompetent for this great right of citizenship.

Whittier's lines should be written over every polling booth:

Not lightly fall beyond recall,
The written scrolls a breath can float,
The crowning fact, the highest act
Of freedom is the freeman's vote.

A second requisite in a good citizen is that he be useful up to the measure of his capacities.

What are our national resources? Millions of acres of fertile land? Inexhaustible quantities of minerals and precious stones in the bowels of the earth? The coveted treasures of the finney deep? These in themselves would never make a nation great. They existed during all the centuries the savages roved over the land. The greatness of a nation is in her citizens. Her grandest resources are in their capacities. Athens was a great nation. She had but limited material resources. Her greatness was in the mental qualities of her citizens. Great Britain is not distinguished by

her size but by her industry allied to intellect. Intelligence is a great factor in all labour. There is a wide difference between the value of a well-trained and an ill-trained workman. You can discern as you pass by the difference between the skilled and the unskilled farmer. The German saying is one that should be engraven on the door of every workshop, *jeder Arbeiter ist auch ein kopfarbeiter*. Who can tell what riches there may be for a nation in the brain of one Edison?

Further, to be a good citizen a man must possess character—character in which the great elements of truth, justice and courage are combined. High moral character in the people greatly enhances the value of a nation's material resources. Hence it is easy to see that preachers and teachers whose work it is to build up character may be the greatest producers in the land.

The heart of the question is reached by the well-put question, "What would a house and lot be worth in Sodom?" The character of her citizens is the only guarantee of the stability of a State. It is character alone that gives worth to life, national or individual. Let me quote the sonorous sentences of Edmund Burke:

"Men are qualified for civil liberty in exact proportion to their disposition to put moral chains upon their appetites; in proportion as their love to justice is above their rapacity; in proportion as their soundness and sobriety of understanding is above their vanity and presumption; in proportion as they are more disposed to listen to the counsel of the wise and good in preference to the flattery of knaves. The picture of the good citizen is before us. The kind of national life desired is before us. We want a nation composed of citizens who shall be intelligent, free, well-trained, patriotic and virtuous.

But how can this be attained?

"By what drugs, what charms, what conjuration and what mighty magic" is such a nation to be made a reality not a vision? Shall we look to the politicians for this higher life? Will they cast forth the unclean spirits? Will Satan cast out Satan?

The spirit of our politics is pre-eminently the spirit of party. The spirit of party is everywhere and in all things a lying spirit. Our party politics is a school of untruthfulness. It cannot fail to be anything else. Where will you find the party man who can speak the truth concerning his neighbour's position? Where will you find a party newspaper that will give an honest report of a political meeting? Is the following a caricature?

Editor of Party Organ: "Coarse and abusive remarks." "That's a good phrase. By the way, Mr. Blower is on the other side isn't he?"

City Editor: "Oh, no, he's one of our speakers."

Editor: "So? Let me see. I think you had better change that to 'Keen and incisive.'"

Party politics is a school of uncharitableness as well as of untruthfulness. This is manifest in the constant imputation of the worst motives, the misconstruction of purposes and the constant onslaught on the characters of political opponents. It is, moreover, not out of the way to say that party politics is a school of disloyalty, for party is on many a vital occasion substituted for country. The party man is not a free man, and the rule we have applied to the voter we would apply to the M.P. If party binds him so that he is not a free man he has no right to vote in Parliament at all. It is quite evident then that in such a school and in such an atmosphere the good citizen cannot be bred.

Where then shall we turn? I answer to the teacher and the preacher.

The school-house and the sanctuary are the only hope for the purification and maintenance of sound national life.

"The whining schoolboy, with his satchel and shining morning face, creeping like a snail unwillingly to school" is not a voter, but he is the stuff of which voters are made. He is imbibing the principles according to which he will vote. In these lads you have the nation to be. The nation in these lads is laid in the hands of the public school teacher. Following out then the principles I have laid down, what should be done with them? They are to receive an education by which their intelligence shall be brightened, their capacities trained and directed in right channels, their wills disciplined and their consciences enlightened.

To accomplish the highest results we believe that technical education will vindicate for itself a place in every school, so that men and women shall be made efficient for their life work up to the limit of their capacities.

We believe that a political education will be given developing the idea of citizenship and the sentiment of patriotism. We are "but a colony," and

the fact operates against us prejudicially so far as national spirit is concerned, but we have a rich heritage of patriotic records, abundant material for the development of patriotic sentiment. Here, above all, should be laid the foundation of character on the fundamental principles of religion and morality. These have ever formed the security of national life. The political consequences of a right education cannot be over-estimated. We talk grandly of our free government, but if the people be not suitably educated the so-called free government is the worst of tyrannies. For free government it is not only necessary that the power be in the hands of the people; it is necessary that it be in the hands of an intelligent, free, sober-minded, patriotic, virtuous people.

Teachers, you see your noble vocation. It is ill paid as all noble vocations are, but it is a vocation worthy of all your powers. Education precedes legislation in the march of liberty, yet have I heard of men ambitious to figure as second-class politicians who were first-class teachers.

DRAWING IN THE HIGH SCHOOLS AND COLLEGIATE INSTITUTES OF ONTARIO. — III.

COLIN A. SCOTT, OTTAWA.

IN opposition to the argument of the two preceding papers, it might be advanced that drawing was not intended by those who outlined our Educational Programme to subserve the interests of art, but merely to afford a relaxation from more intellectual pursuits to give some manual training, to cultivate carefulness, cleanliness, and that greatest of all qualities — neatness. Such an idea, at least, seems to dominate the present teaching of the subject. But it is

just this base prostitution of a study intended for nobler ends that leads to the monotony and drudgery which is generally characteristic of the drawing hour. If drawing is not itself an art it is of value only in relationship to art, and it must be placed in this relationship before any good results can be expected. After that is accomplished, it may be related on the other and lower side to the qualities already mentioned. It may then be somewhat serviceable in cultivating

the minor graces. It may even afford some manual training, although drawing simply means the power to see. The hands are not necessary. The mouth might hold the pencil just as well. One of the cleverest artists of Europe works entirely with her feet, her arms being paralyzed; and this is no wonder at all to anyone who knows. There is only one advantage which we must forego: drawing will never afford a relaxation from more intellectual pursuits.

If drawing can yield its proper service only in relationship to art, the question broadens into a larger one. Of what value are the Graphic Arts in education; what good are they in the community; what use in life? The general relationship of these arts to life from the historic and sociological standpoint would, if we had the time, prove exceedingly interesting. In the Japanese, for example, we have a nation of artists arrived, in many points, at a higher state of development and civilization than ourselves. Their delicate cleanliness, their exquisite sense of decoration, the true refinement of their lesser manners are greatly beyond our present attainment, while, for a happy and contented political condition, until recent contamination by western ideas, they were hardly to be equalled on the earth. Such may be shown to be the direct outcome of the artistic spirit in Japan, and many other countries would prove equally interesting and instructive. The high estimation, too, in which the Graphic Arts have been held by authorities on education might have its weight with those who are capable of taking advice. A striking instance is that of Carlyle. In conversation with Woolner and Wm. Bell Scott, he said, that he never in the course of his life so earnestly desired anything as in his youthful days he desired to learn the art of drawing; but that in the circumstances of his

life there was no possibility, and it had been to him a life-long regret. He said he believed that no man ever took more pleasure in reading than he had done all his life, and that most of what he knew had been obtained from books; but were he asked which alone would be of most advantage to a man during his career, for sharpening his faculties, giving him a clearer perception of facts and a love of truth—the power to read or the power to draw—he would say that on the whole drawing was the more valuable.

But it is principally from the Canadian standpoint that I desire to speak. Is it not possible to show that Art is a good thing for us, and to be worth the labour of seeking after, and, if so, that we are responsible for the search, and in this department, as well as in others, must face the fate that follows those who fail to keep ahead? For if our Canadian life is to be a real thing, however widely related to other life in other lands, it must be independent, self-contained, and capable of permeating every part. We cannot afford to have a vital department of thought and effort like that of Art remain unused and undeveloped. Like an unused arm it will not only become atrophied itself, but spread the elements of weakness throughout the whole.

The artist and the community must always be in reciprocal relationship, and such we find to be the case in Canada. There are no great artists, as there is not a great community. But there is this difference, that the artists are a great deal in advance of their community. Much more so, too, than were Titian or Rembrandt in advance of theirs. And, for this reason, modern advancement is breaking down the old lines of nationality. In the course of evolution the plant type of organization with its separate

well-divided cells is giving way to the animal type, where the cellular outlines are blurred and confused, less perfect in their outlines, although more perfect in themselves and contributing to a higher type. Modern means of communicating thought tends to the formation of wider circles of influence and a deeper organization. Cosmopolitanism is the watchword of the day. When an artist finds the Canadian atmosphere too stifling for his needs, without even leaving his country or his home, it is possible for him to come into a considerable measure of contact with the richer minds of more developed lands. Who can estimate what every modern artist owes to "the fair foster-mother—France," with her wealth of pictures and the simplicity and directness of her style? In this wide contact it is possible for the artist to grow quite out of reach of the people among which he lives, who, although they may open their foolish mouths in amazement at what is to them such an advanced degree of culture, yet are not able to apply that real appreciation which must underlie all worthy admiration. The artist is thus dwarfed in his development, and learns to cater to the love of speculation, to pride and vanity, and other motives more common than the love of art, or in his struggle after real estimation is forced to leave the land that gave him birth.

But it is not only in the lives of artists that the lack of art may be shown to be a serious thing. Although in happy—no, in unhappy ignorance thereof, the people suffer too. The vulgar pretentiousness of our cities with all their modern improvements, the bare discomfort of our school-rooms, the false voluptuousness of our house-furnishings that stands in the road of real voluptuousness that we want the display of crude decoration, of hideous pictures that blind

men rich and poor alike hang upon their walls to fill a vacant space and mark their social standing, all show clearly the serious effects of a lack of artistic feeling. The most of what man has done in Canada, in as far as it appeals to the eye, is in a state of sheer ugliness. Small wonder that the artist and the poet betake themselves to the woods and to the fields. But it is just here it we will that our salvation lies. The reformation must begin at the top, although it is a pity for us if it end there. We have already in Canada good artists, especially of landscapes. What we want is a community to appreciate them and their work. That being given, the details of architecture and house-furnishing will surely follow. The art of painting embraces and transcends the others. And further, as in Germany and France, the higher development of the artist means also the development of the artisan. Trade and manufactures will derive more vital stimulus from the heightening of public taste than from any protective tariff, however necessary that may be.

If this particular cell of the world, Canada, is to remain such, it must be able to retain its artists and give them employment and the opportunity of development. All the manifold occupations of manufacturing, commercial and professional industry are necessary for Canada. Every man will not be a farmer. We must fill the capacities which we are able to generate. If Canada is to be a living part of the world it must have no less than the life of the world in itself. Cosmopolitanism is the watchword, but it depends upon ourselves if it is to be a destructive cosmopolitanism like that of the Greeks in the time of Alexander, or a cosmopolitanism which shall intensify and strengthen every part.

To supply what is lacking is as much

one person's business as another's. Our politicians, in keeping with their profession of statesmanship, might be expected to do something in this respect. But politicians never lead, only sometimes they follow; as in France, of which Hamerton says: "Nor could any popular government altogether refuse to employ artists and keep up picture galleries." Our politicians will be likely to look to others for any real improvement. They will point in all directions, but more particularly to education. Here is the darkest corner. "We look to education for the improvement of the masses; we are the flies upon the wheel." The teeming nothingness of

childhood is to afford the solutions which they are not capable of accomplishing with fully rational individuals. The "mere schoolmaster" whom they despise must correct their blunders and make good their deficiencies. But what if the paradoxical profession should really accomplish this very result!

I set out with the intention of showing art to be a good thing for us, but an ideal is incapable of demonstration, and I have only succeeded in showing that no art is a bad thing for us. Canada does not just now present the materials for the positive demonstration. That will have to be "another story."

RHYME AND REASON.*

BY A. H. MORRISON, BRANTFORD COLLEGIATE INSTITUTE

The mind is its own place, and of itself
Can make a hell of heaven, a heaven of hell.

—PARADISE LOST.

THIS paper makes no pretension to be a thorough exposition of the text, nor even a very sequential or exhaustive thesis of any sort. It is a mere argument in embryo, whose parts are bound together by links of illustration and suggestion, links that each may extend for himself, as far as, and in whatsoever direction, he chooses, "only this and nothing more."

If you were to travel a long distance from here, east and south, in the direction of the rising sun, you would, in course of time, come to a triangular plateau of vast size and great geographical and historical interest, known as the peninsula of Hindustan or India.

This great plateau, belted on either

hand by the Eastern and Western Ghauts, and on the north and north-west by the giant chains of the Himalaya and the Soliman ranges, is alive with people, the dusky-skinned children of the sun.

A mild and indolent race for the most part, of a somewhat fatalistic and long-suffering habit of mind; here the generations have lived and toiled and died through long ages of patriarchal government, priestly rule, or foreign domination, apathetic, uncomplaining, and, in some respects, unprogressive.

What have we to do with these dusky denizens of a far-distant, strange and, to some of us at least, uncongenial clime, the faint echoes of whose foot-falls in life scarce reach these western shores, whose hoarse murmur of unrest, though welling ceaselessly from two hundred and fifty millions of throats, is scarce wafted to Canadian ears?

* Read before the Collegiate Literary Society.

Simply this, I would ask you to walk with me in imagination at night-fall, when the labours of the day are over, through the length and breadth of that immense area of the peninsula known as Bengal; to stand with me on the outskirts of the village as the veil of the evening falls over the tired face of day; to thread with me the streets of city and town, while the stars twinkle above dome and minaret and terraced roof; or to pace with me before the simple coolie's hut or shepherd's tent, and listen to the message that is being everywhere wafted to the starlight and the night.

To the rude accompaniment of native drum or tom-tom, everywhere ascends the message; in the once busy bazaar, before the huckster's booth, in the area of the caravansera, by the river's marge, in the full starlight, beneath the shadow of the wall, under the impending gloom of mango-tope or jungle bough.

It is the hour of relaxation and song. To the monotonous tap of the drum, wells upward and outward the measured chant, legend or dirge, recitative of war-deed, or refrain of love-lilt, hour after hour, till the stars pale and the shadows strengthen, and the gloom of the blacker midnight settles over everything, hushing, for the time being, even the poetry on the lips of the enthusiastic reciter, and stilling the harsh heart-throbbings of the accompanying drum.

Let us change the scene.

It is no longer a vast stretch of peninsula, palm-crowned and mountain ribbed, but an infinite waste of waters, over which the gray clouds stoop, and whose surface is dotted, far as eye can reach, with the white and flashing manes of the horses of the sea. There is no land in sight, but a gallant ship is slowly and stubbornly ploughing her way between the wave-ridges towards her distant haven.

And, again, it is evening and starlight, and men even here, within this shell of oaken rib and plank, are resting and enjoying themselves after the manner of their kind.

A group of blue-jackets, hardy children of the sea, with cheeks like russet apples kissed by the breath of winter, throats bare, and muscles, which stand out like knotted cords beneath their duck or canvas jumpers, are assembled on the foc's'tle, and to the sound of fiddle or fife ascends their evening serenade. Now it is a rollicking chorus: "A Life on the Ocean Wave," or, "A Wet Sheet and a Flowing Sea." Anon, the measure changes. It is a love story told in pathetic verse to the low sobbing of the flute, told as only a sailor can tell such a story, while the waves whisper in sympathy round the prow, and the night breeze sighs another accompaniment among the taut rigging. Once more the measure changes, and it is a lay of home and rest, and the fife ceases to wail and sob, and the very winds stop to listen to the meeting and the greeting of the "Homeward Bound." Then the rollicking chorus breaks in once more, the night falls blacker, and by and bye the tired throats and muscles rest, and all sleep, all save the watch on deck, wakeful and wary, all, save the great, gaunt, oaken-ribbed, sea-greyhound, that still tireless and stubborn seeks her quarry, the bright-eyed beacon cresting the border-land of haven and home. But the songs have gone out to the night and are stilled.

Yet once more let us change the scene, and, if it please you, the hour. It is morning, and the landscape with its face yet wet with dew is no longer an unfamiliar one. It is home, the mother-land, Canada of the maple leaf, the scarlet splendour and the yellow glory. Yonder is the village school; and the fresh young voices of children come welling from the

open windows. They are singing a delightful little ditty, it matters not what. The music is there! That is enough. We know the poetry is there also, though we cannot distinguish the words.

The song is ended and there is a hush. A change of lessons probably. And then the song breaks in once more; but, surely not a Canadian, nor even a western strain. This one resembles more the monotonous chant of far-away, star-lit Hindostan. Listen! Twice one *are* two, twice two *are* four, twice three *are* six, twice four *are* eight, so on till twelve times twelve is reached. The ponderous, leaden-footed mammoth of mathematical complexity, tripping, or trying to trip, to the jingle of a lullaby.

Here are three pictures, word-pictures, well or ill-drawn, as you will; a tropical scene, a marine, both by starlight, and a simple, rustic panel, with the western dews yet shimmering on its pigments.

And now for the moral.

Each of these pictures is animated by a soul, and in each case is the soul a simple, unsophisticated one; a half-naked denizen of an Eastern plateau, a bare-throated son of Neptune, with the arm of Achilles and the frankness of a child—a child itself, piping its morning music to the tremendous libretto of the multiplication table.

And with each soul is associated a song, that is, with each life is incorporated some poetry. And that song, that poetry is its rest. The coolie has ceased to delve and sow and gather. He rests, to sing. The sailor has ceased to hand and reef and steer, he too rests, to sing. The child, although at labour, has to be persuaded that its labour is partly rest, and so he sings, and to him it is relaxation. Figures float on gossamer wings, and the multiplication table, yea, that most abstruse and confound-

ing equation: $11 \text{ times } 11 = 121$, solves itself to the pulsings of a madrigal.

I fancy I hear some one say, I do not quite see the moral.

Then I must elaborate it. In this prosaic clime it is too much the fashion with a class to belittle poetry, indeed, to ignore it altogether. The troubadour is long dead, so too is the minnesinger. The lover here, now-a-days, instead of tilting odes to his listening mistress' eyebrow by the light of the moon, listens himself, a dull and sombre swain enough, to the musical jingle of his inamorata's money bags, that failing, so, but too frequently, does the swain.

There is not much money in poetry, so the practical adult masses ignore it. Only the few truly esteem it, for only the few understand it, or attempt to understand it. But worse sometimes follows in the wake of this unsympathetic attitude towards the muse; from simple neglect, the disaffected pass to aversion and a hostile demeanour to all things metrical and æsthetical. "I don't see any thing in pō-try (*sic*)" says one. "I hate it," chirps another. "Well, it's all a senseless jingle of words," grunts a third. "I never could understand it," simpers a fourth. So on, *ad infinitum*.

Of what is all this a proof? The artificiality, or coarseness, or utter soul-lack of these lives into which no poetry enters. For, observe, the poet is most like the child, and poetry is always dearest to the child-heart, and, next to the child, to the simpler minded inhabitants of this mundane sphere; as instance, the Asiatic coolie and the sailor, two types I have specially culled from a sufficiently large area of unsophisticated human nature. Being natural, these types appreciate that which is natural as a means of instruction or relaxation. This means of instruction or relaxation is gener-

ally poetry, and this poetry being natural and attractive to simple natures must contain within itself sympathetic gems of the necessary and the good. "Let me make the songs of a people," says one wise in his generation, "and I care not who makes its laws."

Now I can not and will not attempt to defend the troubadour as an institution from all points of view, neither am I such a stickler for the good old times as to close my eyes to the very great advantages of practical life, and the immense strides made in other directions than poetry and song, even in "this Canada of ours," since the age of the minnesingers. But I do aver and am prepared to defend my position, that man, intellectually, is at least a double-sided creature, a rational being, and at the same time an imaginative one, and that unless the pure reasoning faculties and the imaginative ones are concurrently encouraged and developed, the result must be disappointing; for a creature of pure reason is a mere calculating machine, and a being of pure imagination is a sentient whirligig, a human waif which every wind of chance or fancy turns according to its passing whim.

Too much attention paid to the development of the judgment tends to make man judicially opposed to all theories, questions and problems, etc., etc., that cannot be proved. He is a critical automaton with but one movement, the slow, ponderous, and, to some extent, debasing stride of the utilitarian mastodon. On the other hand, we must all admit that too much attention paid to the development of the mere æsthetical faculties tends to deprive judgment itself of that strength which is the proudest attribute of the so-called rational mind. It is enervating. It surfeits with its very sweets, and clogs the

passages of the deeper insight into the true essences of things and actions. But a judge, without some poetry in his composition, is simply a forensic hangman, and a visionary without some judgment is only an æsthetic harlequin. Between the extremes is the true creation; the mind, so evenly balanced as not to be warped by mechanical prejudice and dry-as-dust logic or fact, nor yet relaxed by those drowsy mental syrups that induce mere chimerical dreaming, enervating draughts drawn exclusively from the poppy and mandragora of unreality.

Let Poetry walk evermore hand-in-hand with Reason; she tempering Dignity and Exact Learning with the sovereign whiteness of her virgin mantle; he, supreme in excellence of practical vigour and achievement, not neglectful of the new attractiveness, the softer radiance, the more enchanting splendour cast by that virgin presence over the toga of his austere and matured virility of acquisition.

The mariner's compass has united the spheres by its magic. The ocean has receded and shores are one which erst were two. But poetry has united the worlds of matter and spirit by its magic, the gulf of darkness that once separated them has vanished, and realms are now filled with the spirits of love, which once held nought but the gruesome fetishes of fear and hate. Columbus and Newton have done much for man. Who shall say that Shakespeare and Tennyson have not done more?

The materialist has said: "There is no life, for all existence is but the prelude to eternal night"; but the poet says: "There is no death, what seems so is transition."

The Calvinistic pessimist says: "All are lost, the mind of man is sinful from his youth up; he is fore-judged and fore-doomed." The poet says:

Oh! yet we trust that somehow good
 Will be the final goal of ill,
 To pangs of nature, sins of will,
 Defects of doubt, and taints of blood;

That nothing walks with aimless feet,
 That not one life shall be destroyed,
 Or cast as rubbish to the void
 Where God hath made the pile complete.

How can I better conclude than
 with the convincing logic of my text:

The mind is its own place, and of itself,
 Can make a hell of heaven, a heaven of hell,
 which I take to mean simply this:
 that a rational mind well stored with
 the beautiful, which is the poetical
 and æsthetical, can never become so

debased as to be the mere abode of
 devildom—can never, in short, make
 a hell of the heaven that is round us;
 nor can the mind, which deliberately
 and persistently closes its eyes to the
 æsthetic beauties of all imaginative
 creations, ever rise above itself to
 transform much of what is selfish, and
 sordid and devilish of earth, into the
 white winged and radiant ministers of
 spiritual light.

I shall recommend my hearers,
 when discussing the relative merits of
 rhyme and reason, in the words of
 the immortal Hamlet, to

Look here, upon this picture, and on this.

VOCATION VERSUS CULTURE.

BY HON. WILLIAM T. HARRIS, LL.D., WASHINGTON. D.C.

THE teacher is by vocation one of
 the most conservative of men.
 In this respect, he is surpassed only
 by the clergyman and the lawyer. He
 is one of the three persons appointed
 by society to preserve its institutions.
 It is necessary for the social whole to
 store up the fruits of its experiments
 and save what it has learned regard-
 ing the best manner of living. This
 experience is embodied in laws, civil
 and criminal, which give proper forms
 of doing important things and define
 what is not to be done. The lawyers
 have the guardianship of this priceless
 heritage of the past, and it is their
 vocation to settle the application of
 those forms to practical life.

But the frame-work of laws and the
 constitution of government are not the
 only precious things which society
 wishes to preserve. There are more
 fundamental things even than these.
 The insight attained by the wisest
 men—by the prophets and seers of
 the human race—into the nature of
 the Great Power that is creating and

governing the world—this insight fur-
 nishes the deeper basis of the conduct
 of life, and, in order that no part of
 the revelation of the sacred doctrine
 may be lost or forgotten, society
 trains up and consecrates a special
 class of men to this service of guard-
 ing the purity of the oracles of reli-
 gion and imparting them to men.

The lawyers are conservative, be-
 cause their whole business is to make
 the affairs of every-day life square
 with the forms prescribed in the
 statute book.

But the clergy are still more conser-
 vative, because they have to deal with
 fundamental convictions of the race,
 or, people which do not belong to the
 class of matters of opinion or indivi-
 dual views, but are rather matters of
 supreme authority. The work of
 religious teachers is chiefly that of
 educating the people into an abiding
 respect for the authority of these
 oracles. For religion is nothing with-
 out faith in authority. Hence the
 clergy are the most conservative por-

tion of society, and woe betide society were this otherwise.

But the school teacher comes next, I think, in the order of the conservative ranks in the community. It is remarked that women are more conservative than men. We should expect this, because the characteristic vocation of woman in the family is the rearing or nurture of children. The child begins life a savage, ignorant of civilization. He must be taught everything: how to take care of his person, how to behave in the presence of others, how to do his work in the world and earn an honest living, how to observe and how to think. He has to learn the view of the world which the civilization has attained. The woman as mother has this work of rearing the child into an observance of these forms of civilized habit. These forms of habit are not written out in statute books and interpreted by a caste of lawyers. They are so subtle that it would be difficult to write them out. They consist of a mass of punctilios and ceremonies, formalities and usages, which consist partly in action and partly in refraining from action. The action of the will in refraining from action is called by the technical term of inhibition. The good mother is always on the alert to see to it that her child learns to inhibit—learns self-control or self-restraint. Out of one thousand things he may do, nine hundred and ninety and nine are improper to be done, and he must refuse to adopt them. Passing by all these, he must do only the one thing proper.

The child who followed every impulse of nature just as the animal does without inhibiting could not live in civilized society. To do this, he must inhibit more than nine-tenths of caprices and impulses and force himself into the forms of behaviour that have been settled by society. Some of these forms and usages are mere fashions that

do not concern objective well-being. Others, however, are habits which concern health or prosperity or peace with one's neighbours and cannot be neglected with impunity.

No wonder that woman becomes conservative when she has, as mother of the family, all the work of training children into the observance of so many forms and usages! Her chief work is inhibiting, this or that and educating the child into the practice of inhibiting constantly. He must repress his animal nature and form in its place a spiritual nature.

The vocation of the mother in rearing the child is taken up and continued by the school teacher. The child has already acquired—thanks to his family education—his bundle of personal habits and the use of language to communicate ideas and to receive them.

But the teacher has many new provinces of habit and knowledge into which to lead the pupil. These belong on the one hand to behaviour and concern the education of the will, and on the other they concern the intellect and relate to perception, reflection, thought and insight.

The special work of the school in the great process of education is that of giving to the youth letters and civil manners. The active process of education includes, as is evident, not only the school, but the family nurture and the church, also the State and civil society.

The school in teaching civil manners differs in its functions from the family. Behaviour in the family is based on a form of socialism—each one shares in the property of the whole, and there is no hard and fixed line of division drawn within the family, such as separates one family from another. Hence, family education does not suffice to develop the individuality of the pupil beyond its most elementary stage. The

school has to develop the secondary stage of individuality, that wherein the youth acquires a deeper independence. The school pupil must learn how to behave towards independent equals and towards those established in authority over him, not by nature like his father and mother, but by civil ordinances appointed his teachers. Omitting for a moment the other phase of school education, that of intellectual training, let me ask you to consider more in detail this education of the pupil's will in the matter of behaviour. This is not theoretical instruction, but essentially practical—the training of the youth in doing. To be sure, the good teacher mixes with his discipline a gradual training into the reasons for it. He shows why the pupil must be observant of the rules of the school—namely, for the efficiency of the school itself. But the instruction in the theory of good behaviour is not so important as the practical training itself. It is more important that the youth shall form habits of punctuality, regularity, silence and industry, than it is that he shall see the use of these habits.

The school, as I conceive, is in this respect the most signal means that exists for the training in citizenship.

In recent years, we have seen educators give especial attention to this function of education, and a large association has been formed with a view to promote instruction in civics. I do not think that it has been thoroughly considered how exactly the well-disciplined school furnishes just the training that is needed in civics.

Coming from the family, the child is fully nurtured in the clan feeling; he now must be educated out of the clan feeling into civil obedience. The form of school discipline furnishes this kind of education. The youth finds prescribed tasks and is required

to form habits of working in concert with others. He must practice rigidly the semi-mechanical virtues of regularity, punctuality, silence, and industry in obedience to the constituted authority of the teacher. We must not fail to notice that those semi-mechanical virtues are just what is required to adapt the man to combine with his fellow man. He must restrain himself out of respect for the rights of others. He must be persistent, regular, and punctual, or his work will interfere with that of others. He must be industrious. There is no community where so much respect is taught for equals and superiors as in the school. Civil behaviour is not the behaviour that is demanded within the family—that is too much one of mutual confidence and interdependence. The form of school order is of a more advanced quality, because it presupposes independent interests combined with a common interest.

The child who behaves well at school, therefore, practises such conduct as enables him to co-operate with others in the community and respect others' rights, while he supports a common authority. The school pupil simply gets used to established order and expects it and obeys it as a habit. He will maintain it by a sort of instinct in after life, whether he has ever learned the theory of it or not. But the good school inculcates gradually the principles of its rationality in the mind of the pupils. They gradually come to see that rules of order are based on deep underlying reasons, and are not the arbitrary will of the teacher, but the necessity of the school itself as a social institution. If youth are to be collected into an institution, the school, in order to be taught, it is necessary that they should observe such rules and regulations as make possible the instruction of the same in classes and by teachers.

Having taken this glance at the purely practical work of the school as training in civics or citizenship, let us consider in fuller detail the work for it in the training of the intellect. We have said that the school has for its specific work the preparation of the pupil for independent citizenship by civic habits and letters. Letters include the intellectual side of his training. The printed page is an instrumentality of inter-communication. It enables the individual to enter into the fruits of all human life—the observations of men past and present, their thoughts and reflections on things and events of the world, and their actions and successes or failures. The participation in all this is given with the training in letters; reading, writing, arithmetic, geography, history, grammar are the first studies of the school and they form the vestibule or fore court that leads to that intellectual participation of each man with all men which constitutes civilization.

I have called the school teacher one of the most conservative members of society. It has become evident ere this why he deserves this epithet. He has to pull against the tendency of his pupils to capricious and arbitrary behaviour. He must impose on them the form of reason in the place of their wild naturalness. The teacher insists on the adoption of the prescribed forms, and this is the essence of conservatism.

The teacher is conservative not merely in matters of will-training—matters of habit and action—but he is conservative also in the intellectual part of his instruction. He teaches the five cardinal branches as if they contained the wisdom of the race handed down to the rising generation. In fact, there is substantial truth in this assumption. Even in these times of rapid progress, the new acquisitions to the world's reservoir of human learning are not enough to cause any

material change in the school compends of one generation to fit them for the children of the next. The aggregate of old knowledge bears so great a disproportion to the new that the work of the teacher goes, nearly all of it, for the guidance of the pupil in mastering what is traditional.

But here is the place for an important distinction. While the family education lays chief stress on the implicit obedience of the child and does not trust much to the child's ability to comprehend reasons, the school on the other hand is bound to kindle as much of self-activity as possible.

In receiving his heritage of the wisdom of the race, the youth should verify it in his own experience and to some extent, by the method of investigation, conduct experiments of his own. The school should, in short, make the pupil's knowledge live knowledge.

Here makes its appearance one of the two great paradoxes in education. While education is conservative and makes it its chief business to initiate the child into what has already been learned and done before his time, it at the same time insists that he shall receive this learning actively and digest this knowledge by his own thinking and observation. It is quite natural that schools will differ in this respect, and, while some will lay most stress on the acquisition, others will lay most stress on the assimilation. The one class of schools will lay more stress on the memory, and the other will lay more stress on original investigation.

There will be in this matter, also, differences of nations one with another, extending from top to bottom through the entire educational structure.

Each nation has traditions of its own, and we in this country, and for the most part I believe that other Anglo Saxon countries are with us,

find ourselves in a deep contrast to the German school system. We, as a people, lay more stress on prescription—we require that the pupil shall conform himself to the prescribed rules of behaviour and the matter to be learned. We have more faith in the memory and are, as a people, somewhat sceptical in regard to the value of the pupil's original work. We think it is better for him to use most of his time in learning the stores that have been accumulated. Hence it comes, that the reform in education, led forward in Germany by Pestalozzi and Froebel and carried out into practice by the pedagogues of those nations, is a perpetual challenge to the educational methods of English-speaking nations, and perhaps I may include, too, all other European nations. The Romanic and the Anglo-Saxon peoples have always laid more stress on memory work with children than their German contemporaries. They have filled the memory of the child with prescribed conventionalities of intelligence, and have required strict obedience to external authority in the matter of behaviour.

The German theory of education seems to take for granted, without the slightest question, the docility of the pupil. The German child belongs to a knowledge-loving race. Hence the German theory of education makes prominent the self-activity of the child as the one object of education. It repudiates foreign constraint either in conduct or in intellect. It condemns memorizing as a process of enslaving the intellect to dead items of information or opinion. It condemns the strict discipline of the schools as producing mechanical habits of obedience to the will of others. To awake the pupil's mind intellectually is theoretically the chief aim; critical alertness, and individual power to test and verify the statements of others, as

well as to undertake works of original investigation—these are the supreme objects of German pedagogy.

Students of ethnology are aware, however, that nations differ in respect to their bent of mind and their natural aptitudes. The pedagogy of peoples is wont to be based on some insight into these aptitudes and the consequent necessity of inhabiting excesses. The Germanic nations are knowledge-loving, but the Anglo-Saxon nationalities love adventure and the exercise of the will power far more than they love science. The precocious English or American child exhibits an amount of restlessness and caprice which compels his teacher to direct a large amount of nervous energy from the work of pure instruction to the work that is called discipline, or government of the school. The child with precocious directive powers, and correspondingly small love of knowledge for its own sake, is very difficult to manage in the schoolroom.

This gives us the clue to that tendency in our pedagogy and to that in all English-speaking countries, to allow intellectual instruction to degenerate into exercise of the memory alone. Memorized work may be tested with the least possible trouble—it does not distract the attention of the teacher from the work of keeping order and discipline in his school.

But ever since I began to attend educational meetings, I have heard this memory work condemned and the work of the thinking powers and original observation commended. I do not know how much longer it has been the fashion in teachers' assemblies to attack the one-sidedness of our practice. But, on reading Locke and Milton, one may conclude that it has always been the staple subject of educational discussion.

One is tempted to ask the question how much our methods have been modified.

The growth of cities has increased the proportion of graded schools, and classification has increased the length of time devoted to the conduct of a lesson. This alone of itself has led to a greater degree of thoroughness. The lesson has been analyzed more critically, the pupil has been called upon to explain in his own words the thought of the text-book, and finally he has undertaken laboratory work and the comparison of authors. The rapid increase of cities, then, has brought about a reform of our methods in the direction of the German ideal. But we still lay more stress on discipline in our schools than we do upon intellectual instruction, and we doubtless shall continue to do so while the character of our people remains action-loving rather than knowledge-loving. Our inhibitory work we see must lie along the lines of caprice and adventure. The German must look out for a defect in a different quarter. He must make his knowledge-loving children

as active as possible and stir them up to adventure and original effort, at least in the realm of the intellect. We, Americans, defend our great tendency to prescription by calling it moral education and asserting that it is far more important than intellectual education.

We have already seen how easy it is to defend it, in our discussion of instruction as furnished by the well-disciplined school.

The second great paradox in school education is the counter-impulse of the course of study to drift towards preparation for one's industrial vocation on the one hand, or on the other hand towards ideal standards of culture removed from the wants of daily life. It is the conflict between the bread and butter and the culture studies. This second paradox is quite as much a perennial subject of educational discussion as is that first one of prescription *versus* spontaneity, or self activity *versus* conformity to imposed patterns.—*Education*.

THE SIMPLIFICATION OF ELEMENTARY MATHEMATICAL TEACHING.

BY G. HEPPEL, ESQ., M.A.

(Continued from December Number).

ABOUT algebra, at the present time, I propose to ask you to consider what has been said by the best authorities. It is impossible, however, to continue keeping geometry out of the way, as both geometry and trigonometry come into close connection with modern algebra. Professor Chrystal says, in his address to the British Association at Aberdeen in 1885:

"In the higher teaching, which interests me most, I have to complain

of the utter neglect of the all-important notion of algebraic form. I found, when I first tried to teach University student's co-ordinate geometry, that I had to go back and teach them algebra over again. The fundamental idea of an integral function of a certain degree having a certain form and so many coefficients, was to them as much an unknown quantity as the proverbial x . I found that their notion of higher algebra was the solution of harder and harder equations.

The curious thing is that many examination candidates, who show great facility in reducing exceptional equations to quadratics, appear not to have the remotest idea beforehand of the number of solutions to be expected; and that they will very often produce for you, by some fallacious mechanical process, a solution which is none at all. In short, the logic of the subject, which, both educationally and scientifically speaking, is the most important part of it, is wholly neglected. The whole training consists in example-grinding. What should have been merely the help to attain the end has become the end itself. The result is that algebra, as we teach it, is neither an art nor a science, but an ill-digested farrago of rules, whose object is the solution of examination problems."

Perhaps the most important part of this criticism is where the Professor speaks of the omission of any account of what is meant by an integral, rational, algebraical function of x . It is most remarkable that, while the ordinary arithmetical notation deals with one special instance of such a function, where the value of x is 10, and the coefficients must all be positive and less than 10, the elementary books do not generalize this idea, so as to make x arbitrary, and the coefficients positive or negative, and unlimited in value. In arithmetic, the ten, which is the radix of the scale, is not expressed, but is left to be understood; surely, it would be desirable to do the same thing with the x , to go through all the working with detached coefficients, and introduce x only in the final result. A little practice with detached coefficients in working multiplication, division, G.C.M., and square root, would teach a boy more about integral rational functions than he now knows when he goes up to the University. Supposing that the associative, distribu-

tive, commutative, and index laws are once stated, and negative quantities recognized, I believe all the rudimentary operations of algebra might be made to fall under the one direction, that they were the same as the corresponding operations in arithmetic, subject to the following alterations:—

(1) There is no carrying, as x is arbitrary, and not a known, given quantity. (2) We cannot talk of one expression as being greater or less than another, but only of its being of higher or lower degree. (3) There is never any need of tentative methods to get the first or any other term in the quotient of a division. It is always found by dividing the term first in order of the remainder by the term first in order of the quotient. (4) Certain minor modifications are required in the G.C.M. process. (5) The L.C.M. should be obtained by separation into factors, as it always should be, but more frequently is not, in arithmetic. (6) In addition of fractions, it is often better to add a few together first, and then another, and so on, instead of all at once as in arithmetic.

The notation $f(x)$, as an abbreviation for a function of x , should be explained, and the theorem that if $f(x)$ is divided by $x - a$, the remainder is $f(a)$, should be demonstrated. This proof involves nothing but first principles; it may come immediately after the first four rules have been practised: it is of the utmost use in all the after part of Algebra; and yet, owing to our miserable plan of regulating our order by tradition instead of reason, many a student never hears anything about this theorem till he has long since passed those parts of the subject where it would have been of the most use to him.

After making acquaintance with $f(x)$, the pupil might be introduced to $f(xy)$ and $f(xyz)$. The various forms of all these functions, whether homo-

geneous or not, the number of terms in a complete function, and some of the simpler properties of each kind, form the elementary part of what Chrystal terms the study of mathematical form, and Sylvester speaks of as morphology. It is scarcely too much to say that an average school-boy first comes to have a dim idea of integral rational functions by noticing how many of the examples he works have expressions with indices going regularly up and down, and he looks upon it as a rather pleasant and kindly device of the writer of his book to make the sums come out neatly. As to classification of expressions he knows nothing. It may be fanciful, but I am often tempted to encourage pupils to ascribe, not merely form, but something like moral and social qualities, to certain functions. Thus $a^2 - b^2$ may be compared to an affable courteous man, ready at all times to do you as much service as he can; $a^2 + b^2$ to one who is difficult of access, somewhat austere and forbidding in appearance, but from whom, when you really get to know him, you will learn much, and have your mind enlarged and improved; $a^3 + b^3 + c^3 - 3abc$ as a rather eccentric person, who is constantly turning up in unexpected places, asking whether you do not remember to have met him before.

In all the rudimentary work one important matter is constantly—I might say universally—neglected. That matter is verification. A boy has made a great step to the front in his mathematical studies when he honestly recognizes the fact that he sometimes makes a mistake. Revision, searching for possible error, do not come naturally to a young learner. He must be trained to practise these checks on his work, as when left to himself, he acts as if he were a small Pope in respect of infallibility. In arithmetic there is the test of correctness by casting out the nines, the one

valuable process we owe to the Arabs; and this is more often neglected than used in school teaching. In algebra there is the test of substituting 1 for x in the work, and seeing whether the result is what it ought to be; and, speaking roughly, it may be said that never is this check taught in schools.

The examination of the form of the products of the factors, $x+a$, $x+b$, $x+c$, etc., and of $x-a$, $x-b$, $x-c$, etc., should be undertaken when multiplication is being taught. Here is almost the sole occasion on which I feel inclined to depart from the order in Chrystal's "Algebra," adopting in preference that in Clifford's "Common Sense of the exact sciences." I think we should here bring to our assistance the first principles of permutations and combinations. The value of the results thus obtained is very great, as giving the means of profuse illustrations of the principles of symmetry, as affording an additional check on accuracy of work, as enabling the pupil to forecast the number of terms he will have to deal with in any process, and as familiarizing him with the valuable symbol Σ , as the sum of terms formed under like conditions. These results are obtained by the purest arithmetic from elementary common-sense principles, without even the idea of a fraction being required. They lead at once to the binomial theorem so far as a positive integral index is concerned.

Some idea of a limit ought to be given at an early stage of the pupil's progress. It is customary at present to look upon circulating decimals as a part of arithmetic which is of little practical importance, and on which much time and attention should not be spent. Nevertheless, the first rudiments of circulating decimals are valuable, if only for the sake of illustrating the nature of a limit. I venture to think that the tendency to

postpone all idea of limits till a late period in the student's course is a mistake. It prevents him from attaining correct ideas of the meanings of the terms *nothing* and *infinity* and the mutual relations between them.

When imaginary quantities come to the front, and we attain the idea of a complex number $a + b\sqrt{-1}$, geometry and trigonometry should be at once called upon to illustrate and interpret. The ideas involved in $\cos \theta$, $\sin \theta$, $\tan \theta$, are so simple that it is a pity that a boy should be deprived of these aids to his progress until he is prepared to practise all the myriad transformations that a trigonometrical expression is capable of. Trigonometry is now not merely the process of solution of triangles—it is the bond of union between algebra and geometry. Algebra, without imaginaries, can be illustrated by lengths, or one-dimensional geometry. The imaginaries enable the idea of direction to be brought in, and require a two-dimensional geometry to illustrate them. We then have what De Morgan calls double algebra, of which he has given a good account in a short space in the article on Algebra in the *English Cyclopædia*. The essential meaning of De Moivre's theorem is thus easily arrived at by graphical interpretation. When a boy first meets with $\cos \theta + \sin \theta \sqrt{-1}$, he has a notion that there is some artful juggling process going on, and he afterwards finds that this process enables him to do certain things; but not till far later, sometimes never, does he grasp the idea that it represents the fact that if you turn a line round one end a little way, and then a little more, the result is the same as if you had done all the turning at once.

For those who look upon algebra in the light in which I have endeavoured to present it, Professor Chrystal's treatise is a storehouse of treasure. As a school text-book, however,

it seems to have three important defects. It is too big, too dear, and too complete. A "Chrystal for beginners" would be invaluable to teachers.

With respect to the important subject of the teaching of geometry, it is not necessary to say much. We have in Euclid a magnificent production of genius, which is at once an almost perfect treatise on elementary geometry, and also a complete illustration of logical principles, such as we can find nowhere else. And yet, just as the seventh, eighth, ninth, and tenth books have fallen into disuse, though they have all Euclid's logic and all his genius, so, many teachers hope, the first six will follow the same road, as far as school teaching is involved. For twenty years the members of the Association for the Improvement of Geometrical Teaching have been steadily working towards this end, believing that Euclid's treatise is ill adapted to the needs of the beginner. They do not wish to have any rival system established by authority, but ask that there should be freedom in teaching geometry. Professor Sylvester says: "The early study of Euclid made me a hater of Geometry." Professor Henrici says: "The more I have become acquainted with the difficulty of the subject, the greater has been my admiration for Euclid's book, whilst my sense of its unfitness as a schoolbook has equally gained in strength." Whether in part due to their action, or not at all, the Association see a great improvement during the twenty years they have worked. The Euclids by Nixon, Langley, Deighton, Taylor, and others are very different from the universal Simson of the past. Still, even if we taught Simson exclusively, we might teach it much better than as a rule it is taught. We seem to expect boys to reason with minute accuracy on certain subjects, when those subjects are quite unfamiliar to them,

and they have no knowledge of the first principles of reasoning. Accordingly there is a general agreement among the best teachers that quite little boys should be set to work with rule and compasses at simple problems in practical geometry, and that the illustration in any easy form of some of the first principles of logic should precede the study of propositions in geometry. Such logical outlines are given in Henrici's "Geometry of Congruent Figures," and in the textbook of the Association. These are two works fairly representative of several which are essays towards a more rational system of teaching geometry. As the whole subject of instruction in this part of mathematics is now being actively considered by those who are far better fitted than myself to deal with it, I may be excused from saying more about it.

As a summing up of the whole matter, algebra, geometry, trigonometry, being taken all together, let me quote the eloquent words of Professor Sylvester, giving his ideal of mathematical teaching, and then let me conclude with a few words of practical commentary. After contrasting the methods of instruction in natural and experimental science with those in mathematics, the Professor says .

"I should rejoice to see mathematics taught with that life and animation which the presence and example of her young and buoyant sister could not fail to impart—short roads preferred to long ones—Euclid honourably shelved or buried 'deeper than did ever plummet sound' out of the schoolboy's reach—morphology introduced into the elements of algebra—projection, correlation, motion accepted as aids to geometry—the mind of the student quickened and elevated and his faith awakened by early initiation into the ruling ideas of polarity, continuity, infinity, and familiarization with the doctrine of the

imaginary and inconceivable. It is this living interest in the subject which is so wanting in our traditional and mediæval modes of teaching."

To this, no doubt, many teachers will reply, "Just in so far as we move on towards this high ideal, we move farther away from the examination tests which our pupils must undergo, and for which we are bound both in honour and for our own interests to prepare them." This is a practical matter, where each must judge for himself. Speaking from my own experience, I believe teachers need not look on examinations as their masters. The first great consideration is to teach the subject thoroughly. When that is done, the adaptation of the pupil's knowledge to the limitations and rules, often very absurd, of the examination is not very difficult. For my own part, I look upon some examinations as a kind of obstacle races.

If boys are to compete in swimming with one hand tied behind, or in playing cricket with broomsticks, it is surely better to train them in normal swimming and cricket to begin with, and practise the restrictions later on. I have often found among both teachers and pupils a nervous anxiety lest something or other should be learnt "which is not wanted in the examination," however much that something might render easier the task of learning what was wanted. Even in the lowest and most material sense, it is the best, most thorough teaching which pays the best, and not that which veers about with every change in the regulations.

But there are far higher considerations than these. If mathematics has come to be almost a by-word for something dry, without human interest, without life, without soul, it is we teachers that have made it so. Studied freely and ungrudgingly, it has a music and a poetry of its own; the

emotions of wonder, admiration, and reverence are not foreign to it; and while music appeals to something not of sense, not of intellect, deep hidden in our spiritual nature, so mathematics, leading us to the impassable boundar-

ies of finite human intelligence, gives us glimpses of what lies beyond, some faint foretaste of what beings of higher intelligence know now, and we may know hereafter. — *The Educational Times*.

THE READING HABIT.

OF all the habits that can be cultivated, none is more productive of pleasure and improvement than that of reading, provided the books be well chosen.

Reading is a recreation—the rest and refreshment that make one feel like a new being—but it is much more. It is not only the wine of mental life, it is its daily bread. The study of text books will by no means take the place of general and varied reading. One may be master of several languages and yet not be well read; one may have many accomplishments, and even be proficient in one or more branches of science, and yet be unintelligent on general subjects for lack of a habit of judicious reading.

The quantity of reading that may be done in a year by the employment of even small portions of time is surprising to those who have not observed the matter. It is a delight to think of the amount of information and keen intellectual pleasure obtained by those who follow the “required readings” of the Chautauqua courses after spending less than an hour a day upon them, and equal advantages may follow more desultory reading if it be well chosen.

A lady whom we know is the head of a large family, entertaining much company, and doing a great deal of benevolent work. All these things leave her but little time, yet at the end of a year she will be found to have read more, and to have better assimilated what she has read, than

the majority of men or women of leisure. In her the reading habit is very strong, and leads her to improve every chance moment. Her memory is good and her mental faculties clear, so that she can keep many separate threads of thought in mind without dropping or tangling any. Hence she finds it profitable to have several books on hand at once. For her own “den,” where she is most likely to be found when she has more than a few moments at her disposal, she has always “solid” work of some sort—history, biography, travel, or popularized science. In the sewing room, where she may have to wait short intervals between “fittings,” are kept volumes of selections. On her dressing-table is always another book. In her parlour a small-volumed Shakespeare is ever at hand. In the dining-room are newspapers and magazines. In a drawer in the hall table, ready to be taken when she is going out, are novels or books of short stories, to be read in carriage or horse-cars. Thus she is never obliged to wait idly through even those moments of waiting which are inevitable in every large family.

A very great advantage of this lady's habit is that her whole family receive the benefit of her ever-overflowing mind. Her children bring their studies, her husband his interests, and she her reading to the common fund of intellectual enjoyment. Their table hours are charming. The husband's business is one involving un-

usual cares and responsibilities, and he is often too tired to read, but by his wife's flow of lively chat upon ever fresh topics his mind is, as he expresses it, so "irrigated" that it becomes rich and fruitful, instead of the arid waste which a mind exhausted by business and unrefreshed from without must be. Her children derive from their mother's varied stores countless bits of information

which enable them to better understand their lessons, and are constantly stimulated to greater efforts.

This useful and interesting woman makes no pretensions to learning, and, with the exception of reading and writing the English language with unusual purity and fluency, has no accomplishments; but she is singularly well informed. — *Harber's Bazar.*

THE INEVITABLES.

BY C. A. P.

IF teachers would make out a list of what we might call the inevitables of teaching, and underneath write a solemn vow never to "take arms against the sea of troubles," but submit to their invincible strength, much time and enthusiasm which is now spent in a futile struggle might be devoted to profitable work.

First on this list, should be a reminder, that, in spite of our best efforts, there will always be some pupils who will show little or no appreciable results.

With fifty pupils in a room, there are at least a dozen grades of ability and as many different results may be expected. Some, and they are invariably the ones who need the least attention, respond promptly and well to their instruction. Others requiring much more attention respond less promptly and satisfactorily. While still others, usually a small number, show almost no improvement from day to day.

This last class, every teacher admits, is a source of the greatest anxiety; and it is just here that we should apply our theory of the inevitable. Once sure that they are mentally incapable of anything better than what they offer us, we should desist

from striving or worrying, and, while giving them a fair share of attention and sympathy, pay no further heed to the matter. The strength uselessly expended in knocking one's head against the stone wall of their inability had better be used for those who need and can appreciate one's efforts, for, as an American poet aptly expresses it:—

"You may grind their souls in the self-same mill;
You may bind them heart and brow;
But the poet will follow the rainbow still
While his brother will follow the plow."

Perhaps the one thing which most surely causes "strained relations" among teachers, and is responsible for more heart burnings than anything else in the whole field of teaching, is the habit indulged in by some teachers of finding fault with the work of the teachers below them. So number two on her list should be a reminder that pupils never do any credit to previous teaching for at least a month after they have entered a new class. Hence, we should refrain from even judging, much less criticizing, till that period at least has elapsed. By that time we generally see so many good points that we are tempted to praise rather than blame. Let us wait till

the children have had a chance to collect the threads of association which have become snarled during the long vacation, and we shall perceive that they have a good fund of previous instruction. Then, many children have a habit, in all sincerity too, of saying they "never had" whatever they may have forgotten. After making allowances for these conditions, and reminding ourselves that all we have to do is to make the best of the material sent us, we will find that we have more time and strength to spend on the work in hand, than if a portion of both were spent in finding fault with our neighbours.

One of the prominent weaknesses in human nature is antipathy to work, and this of course is found more frequently in the crude human-nature of children. Number three in the inevitables then should be a recognition of the fact that there will always be a certain amount of natural inertia to

be overcome before there is any hope of a hearty response from the children when work is called for. The question therefore is, how to overcome this with least harm to the pupils' mental condition. Shall we threaten or punish, and so leave a disagreeable association to cling forever to the study? Shall we offer bribes to the successful? It would be better to set about the subject scientifically—with the surgeon's lance rather than a club.

First, let us make their feelings our allies by procuring and doing everything possible to make the subject appear attractive, especially to their senses. These feelings will set the will working in the right direction, and thus the first great barrier is broken down. When habits of work are established the wheels will run more smoothly, and we will not have so much to do to keep the attention if once a personal interest is aroused in any subject.

MORAL EDUCATION.

THE subject of moral education in the public schools is at present enlisting more attention from teachers and the educational conventions than almost any other subject which comes before them for discussion. Rightly or wrongly, it is held by many that, whatever is to be said of the intellectual training given the boys and girls in the schools, the moral training given, the influence of the system upon character is inadequate. How shall morals be taught in the schools? How shall we give the young people stronger and better wills and higher motives?—are questions constantly asked. As in the case of some other questions often asked nowadays in connection with the public schools and general education, no little con-

fusion and misapprehension result from many of these discussions of morals and moral training. Many of them have been directly connected with the discussions of religious teaching in the schools; and many advocates of a kind of religious teaching in the schools which most good people in America deem unwise are rather eager, in their insistence upon the necessity of religious teaching everywhere and always in order to good conduct, to paint the moral condition of the schools and the problem of moral education vastly darker than there was any ground for. The moral condition of the public schools, so far as their own *régime* goes, is almost invariably better than ever before in the history of the public

schools in America. There was probably never before so fine a body of men and women engaged in the work of school-teaching in America as to-day. There is no class in the community whose aims are higher, whose devotion is greater, or whose moral influence is more extensive or salutary; and what the teacher is, the school is. The greatest factor in the moral life and culture of the school, whatever books are conned, there will always be the high-minded teacher. Keep the high-minded teacher in the school, inspire the teacher with a proper sense of his vocation, and moral education will radiate from that teacher, whether the subject before the class be the Ten Commandments or the rule of three. Let this also be never forgotten: that far more moralizing than any particular study of morals in the schools is the very life and regimen of the school itself. This, if the life and regimen be worthy at all, is what—day in and day out, year in and year out—is training the child to habits of punctuality, obedience, order, neatness, attention, industry, truthfulness, respect for others, and appreciation of merit, as no amount of definitions of obedience, attention, and the rest, or of study of

such definitions, could ever do. And this, we take it, is what is desired when we talk of moral education in the schools—such education as shall make obedient, industrious and truthful boys and girls who can tell us cleverly and accurately what truth is, and what industry is, and what obedience is. We are of those who distrust the good of very much direct moral teaching in the schools—very much analytical study, we mean, on the part of the young folks, of the subject of duty and duties. We would not say absolutely that moral science, well presented, has no place in the public school, in the high school at any rate; but we do believe, generally speaking, that it is a study of very questionable advantage there. We hear much said nowadays, sometimes too much, about making education concrete. If there be any place where education should be concrete, it is in what concerns the moral education of boys and girls. What is wanted here is inspiration, something that shall kindle the sense of duty, something that shall give aim and impulse to the larger and better life, something that shall give the public and generous spirit, instead of the selfish and private spirit.—*New England Magazine.*

GEOGRAPHY.

1. A NAME FOR A PART OF THE PACIFIC OCEAN.—That part of the Pacific which lies between the east coast of Australia and Tasmania on one side, and between New Zealand and the Northern groups on the other, has never had a distinctive name. The Australian Association for the Advancement of Science, has now given to this basin the name, Tasman Sea. The British Admiralty has approved of this name, and ordered that it be inserted on the admiralty charts.

AN ANCIENT FOREST.—During the late violent storms in the Channel the sea washed through a high and hard sandbank near St. Malo, nearly thirteen feet thick, laying bare a portion of an ancient forest which was already passing into the condition of coal. This forest at the beginning of our era covered an extensive tract of the coast; but with the sinking of the land it became submerged and covered up by the drifting sand. Mount St. Michael once stood in the middle of

it. The forest had quite disappeared by the middle of the tenth century. Occasionally, at very low tides after storms, remains of it are disclosed, just as at present.—*The School Guardian*.

MAKING THE DESERT BLOSSOM.—The French have done a wonderful work in Algeria in reclaiming waste land by means of artesian wells. There is an area of 329,415 square miles in that part of the continent under French control, one-half of which belongs to the Sahara or desert. In 1857 it was shown that there were large supplies of underground water, and the total number of wells that have been bored since that date is 13,135. Large districts thus watered are used in raising grapes. The date palm also flourishes, and wheat, barley, oats, olives, tobacco, etc., are cultivated.—*The School Journal*.

2. CANADA'S GEOLOGICAL SURVEY.—Canada gives to its Geological Survey only \$60,000 a year, while the various geological surveys in our own country absorb nearly a million dollars annually. Yet Canada makes a fine showing with this modest sum. The annual geological reports are in part records of original discovery and research, and with their fine maps and photogravures are as interesting as many books of travel. Canada contains the largest unknown areas of the American continent.—*Goldthwaite's Geographical Magazine* (N.Y.).

THE DARDANELLES QUESTION.—The water passage which is, perhaps, the most important, politically, and is the most anxiously watched in the world, is the little, narrow strait known as the Dardanelles. It is the channel which joins the Sea of Marmora, and indirectly the Black Sea, with the

Grecian Archipelago, and so with the Mediterranean and the Atlantic beyond. It is the narrow strip of water which separates, at a breadth of from one to four miles, the continent of Asia from that of Europe in that corner of the world. It is forty-seven miles in length, strongly fortified on both sides, and is under the control of the Sultan of Turkey, through whose dominions on either side it flows. The main significance of this water passage is that it is the portal of Constantinople and the Black Sea. For centuries, therefore, it has had a great military and political importance. It is the only southern water outlet by which the great empire of Russia can reach the oceans.

Intimately connected with the straits of the Dardanelles is the long existing ambition of Russia to obtain possession of Constantinople and the European part of the Sultan's dominions. This has really been the purpose of Russia for two centuries. But the other powers of Europe, and especially Great Britain, have always been opposed to the attainment of this Russian ambition, which has brought about two wars within the past forty years. The Crimean War of 1853-6 was fought on the issue whether Russia should have the right to establish naval stations and sail her war ships on the Black Sea, and to send her war ships, as well as her merchantmen, through the Dardanelles. The defeat of Russia by the allied powers of Great Britain, France, Italy, and Turkey in that war resulted in the Treaty of Paris, which practically forbade Russia to do either. It had already been settled fifteen years before, by the treaty of 1841, that no war ship of any nation except Turkey should pass through the Dardanelles without the consent of the Sultan.

But in 1871 Russia took advantage of the general confusion of European affairs caused by the Franco-German

war, to demand the removal of the restriction upon her having naval stations and sailing war ships in the Black Sea; and she succeeded. England could not oppose her alone, and could get no help from the other powers. Six years later Russia entered upon a war with Turkey to gain possession of Constantinople; but although she was victorious over the Turks, an English fleet entered the Dardanelles to protect the ancient Turkish capital. Russia was forced to give up her design; and by the Treaty of Berlin the powers of Europe once more balked her ambition.

Ever since 1871, therefore, Russia has had the right to maintain her fleets in the Black Sea, but has not had the right to send them to and fro through the Dardanelles. In the latter part of last August, the European world was startled by the announcement that Turkey had permitted certain Russian ships—transports carrying soldiers, but not technically

war vessels—to pass through the Dardanelles. Thus the object for which the Crimean war was fought, and which actuated the powers in restraining Russia by the Treaty of Berlin, seemed likely to be lost by the consent of Turkey, which empire the powers, for their own reasons, have always sheltered from Russian aggression. While the ships sent through the Dardanelles were not exactly military armaments, all Europe has been stirred by the fear lest this act is only the entering wedge to the attainment by Russia of her long-cherished design of capturing, not only the waterways, but the dominions of the Sultan.

No doubt the event has given a more warlike aspect to European affairs. It remains to be seen what action the powers will take, and whether Great Britain will interfere, as she has done before, with the progress of Russian encroachments in south-eastern Europe.—*Youth's Companion*.

NOTES FOR TEACHERS.

SPEAKING OF PRODIGIES.—They forget that no one can be taught faster than he can learn.—*Samuel Johnston*.

THE FLAPPING OF A FLY'S WING.—The slow flapping of a butterfly's wing produces no sound, but when the movements are rapid a noise is produced, which increases in shrillness with the number of vibrations. Thus the house-fly, which produces the sound F, vibrates its wings 21,120 times a minute, or 335 times in a second; and the bee, which makes a sound of A, as many as 26,400 times, or 440 times in a second. On the contrary, a tired bee hums on E, and therefore, according to theory, vi-

brates its wings only 330 times in a second. Marcy, the naturalist, after many attempts has succeeded, by a delicate mechanism, in confirming these numbers graphically. He fixes a fly so that the tip of the wing just touched a cylinder, which was moved by clockwork. Each stroke of the wing caused a mark, of course very slight, but still quite perceptible, and thus showed that there were actually 330 strokes in a second, agreeing almost exactly with the number of vibrations inferred from the note produced.—*The School Newspaper*.

A SCHOOLMASTER sends us a small contribution which he hopes may serve as a nest-egg, to the discovery

of what our boys read for themselves. "At the beginning of this term I got each boy in my form (the sixth form in one of the London day-schools) to make a list of the novels that he had read since Easter—that is, just five months. The longest list had fourteen works, and one boy had read only one novel in the time; the average consumption was between six and seven—that is, at the rate of thirteen novels a year. Scott was far and away the most popular, and of living novelists Rider Haggard alone can be called a favourite. The following figures show the number of times that a work of the author named occurs: Scott, 16; Dickens, 10; Kingsley, 7; Rider Haggard, 7; Wilkie Collins, 5; Bulwer-Lytton, 4; Thackeray, 4; Blackmore, 3; George Eliot, 3. I confess I was surprised and gratified to find that so much good literature and so little rubbish was being consumed by boys who have little leisure time and almost unrestricted liberty of choice."—*The Journal of Education*.

HOW PLANTS GROW BY ELECTRIC LIGHT.—Some interesting experiments have been conducted at Cornell University, Ithaca, N.Y., to show the effect of the electric arc light on the growth of plants. A greenhouse, 20 x 60 feet, was divided into two nearly equal portions by a light board partition. The plants in one compartment were treated to ordinary conditions—sun-light by day and darkness by night—and the other had sun-light during the day and electric light during a part or the whole of the night. The effect of the light by night was to greatly hasten the maturity of the plants, especially in the case of such leaf plants as endive, spinach, cress, and lettuce, but the leaves were smaller. The electric light spinach in seven weeks matured and produced good seeds, while that

in the dark house was still making large and edible leaves with no indication of running to seed. For three feet, either side of the lamp, most of the lettuce plant were killed outright; the plants increased in stature, vigour, and size of leaves with increased distance from the lamp. Two varieties of cress behaved in the same way. Those five feet either side of the lamp died soon after coming up, and seven weeks after sowing all surviving plants in the light-house, excepting a few which were shaded, were in bloom, and all were small and the leaves were curled.—*School Journal* (N.Y.).

INDIVIDUALITY.—Processes ought to be adapted, not only to the universal, but to the individual need. It does not follow that the universal need is necessarily or invariably unlike the individual need, or that individual needs are always identical, but any system of education that gives, for a great variety of minds, precisely the same course of training, is sure to be, for a majority of those minds, a pitiful and conspicuous failure. The evil effects of educating in masses, or in classes, is sufficiently apparent to cause us to consider the question whether there is any possible remedy—whether there could be a substitution of individual for general training, or a combination of the two that would produce a better result. That student is losing ground as an individual who comes to be considered or to consider himself as simply a factor of a class. If the general teaching must be that which is applicable to the entire class, there should also be provision for instruction that could be adapted to the individual need, and as great effort as is made to adapt class work to the general need should be made in the special direction also. The day will come, though it may be long in coming, when every institution

of learning will have besides its technical teachers, its lecturers and its conductors of recitations—one man or one woman, or as many men and women as are needed, whose special province it will be to study the individual temperament, to discover native tendencies, tastes and capacities of the mind, and whose knowledge will be true wisdom in the sense that they will know not only how to ascertain, but how to supply real needs. That cramping and stifling of natural tastes, which is now so marked a feature of school training, will be replaced by the cultivation of every good natural ability, and the suppression of only that which in itself is evil. Quite too often, even in this latter day, restraint is put upon the natural powers, simply because their development calls for extra labour and special trouble, or because these powers indicate training in lines of work not being attempted by the class. Let the routine work continue to be done, and, if necessary, in the routine fashion, but let every institution have on its faculty one soul, at least, whose province is not to crush, but to cultivate and develop individual traits of mind and character. Such an instructor must not be ignorant of books, but that intricate book, the human heart, should be his

special study, and he should know, not only what human beings are, but should be able to help them to grow into what God meant them to be. Such a man with a large and sympathetic heart that can be hospitable to boyhood as it is, will do more toward the moulding of genuine manhood than can a dozen professors of the ordinary type. One such woman in every institution for the education of girls holds really the future destiny of those girls in her own hand, for her life among them could have but one dominant desire—that of helping them to be the thing God meant. Practically living out that desire she becomes, not the restraint and destroyer of their natural vitality of thought and feeling, but the guide and director of all their native forces into every beautiful field of learning, and into the highest type of development possible for woman, under present limitations, to attain. Whether we recognize the fact or not, there is not a phase of our social or national life that is unaffected by the lack of proper development of individuality. The whole tendency of our civilization has been in the direction of making people, as nearly as possible, like other people.—*Prof. Mary L. Dickinson, in the Arena for August*

PUBLIC OPINION.

“DRUDGERY.”—The Bishop of Durham says that $\frac{9}{10}$ of all good work is drudgery, and that this drudgery cannot be escaped. In his opinion we should concur, though it may be easily abused. The art of the teacher is seen in converting drudgery into pleasure. The most interesting subject may be made wearisome by bad teaching, and the most unpalatable interesting by good teaching. If more pains

were taken to follow the natural tastes of children, to make the conditions under which they learn happy, to call into play healthy motions and to enliven what is intrinsically dull by utilizing adventitious sources of interest, much of what is now called “drudgery” would disappear. Drudgery is joyless labour, and no labour need be joyless if it be set about in the right spirit. Shakespeare tells us

that "the labour we delight in physics pain," and we may delight in labour for its ends, even when we do not find much pleasure in it as a means. George Herbert tells us how a servant may "make drudgery divine." We are disposed to think, therefore, that the prospect of the student is not quite joyless as the Bishop would represent it. Hard work is before him; but hard work is not necessarily drudgery. Difficulties vanquished, the consciousness of power acquired, and, above all, the sense of duty discharged, convert toil into pleasure.—*The School Guardian*.

One thing stands out clearly from the report. A general scheme of superannuation for the teachers is an absolute necessity in the interests of the schools as well as of the teachers. Sir R. Temple states in the draft report he prepared, "The evidence, together with a study of educational conditions, convince your committee that superannuation is desirable for the sake, not only of the teachers, but of the schools. It is proved that after a certain age the teachers lose the vivacity needful for success, and that unless they can be superannuated they will be retained in positions which, despite their best exertions, they cannot efficiently fill. The question thus becomes one of educational policy as well as that of benevolence towards a body of public servants. In this body your committee will include both men and women belonging both to voluntary schools and board schools." This declaration by the Chairman of the Committee is an important one, but my object is not now to show how fully it is supported by the evidence, but rather to examine the suggested scheme for giving effect to this question of educational economy.—*Sir R. Temple in the Schoolmaster*.

GOOD FEELING.—The maintenance of good feeling between the different races and creeds that call Canada their home, and especially between the French and English-speaking Canadians, is of the greatest importance. We are all so narrow, so conceited, so self-righteous that we find it hard to understand and appreciate another people or another race. It has taken Englishmen and Scotchmen centuries to understand each other, and still a sneer comes readily to the lips of one with regard to the other. English and Irish do not understand one another yet, and therefore do not make allowances that they ought. No wonder, then, that English and French-speaking Canadians seldom do justice to each other, and that demagogues can excite suspicion in the popular mind of each section of the people. Oh, for some God-inspired leader to make us feel that we are all Canadians, and especially to make us who are English speaking able to appreciate the solid worth and the manifold graces of our French-speaking countrymen. They are the very kernel of our country. Canada is more to them than it is to us, simply because they have struck their roots deeper in the soil. And there can be no Canada without cordial friendship between them and ourselves.—*Principal Grant*.

THE IMAGINATION.—The imagination, which used to be looked at with much distrust by serious minded people, is beginning to have its value, as an instrument of education, theoretically and practically recognized. Its employment is absolutely indispensable in the teaching of history, geography and literature. It plays an important part in ethical education as the only means we have of entering into the thoughts and feelings of other people. Professor Tyndall show-

ed, in his famous discourse before the British Association at Liverpool in 1870, the service it may render in the investigations of physical science. And now we have Mr. Goschen claiming for it, in his rectorial address at Edinburgh, a prominent place in every subject that can occupy the mind of man. Whenever we have to deal with the past, the future, the distant or the invisible, the imagination is called into play; wherever analysis decomposes there is room for the imagination to construct. The value of imagination to the teacher is well known to students of the art of education. It is impossible to pourtray vivid pictures for the benefit of others if we

have not such pictures in our own mind. Mr. Goschen said to such of his audience as proposed to become teachers: "If, in entering upon your duties, you do not vigorously apply your imaginative faculties, you will be no better than mere machines, pouring out knowledge but not pouring it in." The distinction is a very important one. A great deal of knowledge is poured out that is not poured in; it is simply spilled because the teacher has not the imagination to realize what are the tastes, difficulties and habits of thought of his pupils. He cannot enter into their minds, and, as a consequence, his teaching cannot either.—*The School Guardian.*

ASTRONOMICAL NOTES—JANUARY—FEBRUARY.

THOMAS LINDSAY, TORONTO.

THE most beautiful of the northern constellations, Orion, is above the horizon during the whole of the night throughout this month, and very moderate optical power reveals many of its beauties. The multiple star σ just south and west of the southernmost star of the "belt" is resolved into five stars by a $2\frac{1}{4}$ inch telescope, and the star θ , the "trapezium," in the midst of the great nebula is resolved very beautifully into four stars by the same power. The fourth star of the trapezium is considered a very good test for a small telescope. The nebula itself in all its grandeur and mystery is of never-ending interest to observers. Among the planets, Jupiter is gradually approaching the sun. We note two occultations of Satellite I. in January favourable for observation, one on the 14th at 7h. 32m., standard time, and the other at 6h. 5m. on the 30th. On Feb. 6th a very close conjunction of Jupiter and Venus,

a sight not often seen, will take place. The latter evening star throughout the month is becoming more brilliant every day. Mercury, now west of the sun and morning star, attains his greatest elongation on the 19th. He rises on the morning of that day at 6h. 15m., standard time, in the direction E. $31^{\circ} 12'$, south. More than ordinary interest has been taken in observing Venus and Mercury since the announcement by Prof. Schiaparelli that these planets rotate as our moon does, once in a period of revolution. Notwithstanding the attainments of the distinguished Italian his statement is open to very grave objections. Such a condition of planetary rotation would be caused by the tidal influence of the sun while the planet was still plastic. This would tend to lengthen the diameter of the revolving body in a line directed to the centre of its revolution. In the case of our moon and of the Satellites of

the planets, this tidal influence has been at work to cause coincidence of rotation and revolution. But as a most able writer, Prof. Coakley, has pointed out, the formula which expresses the elongation of a satellite's diameter in a line directed to its primary does not express a similar elongation towards the sun in the case of Venus and Mercury.

If m , a , r , represent respectively the mass of the central body, the distance and radius of its satellite, then we have for the attractive force upon the nearer hemisphere, the centre and the outer hemisphere,

$$\frac{m}{(a-r)^2}, \frac{m}{a^2}, \frac{m}{(a+r)^2},$$

and it will be found that the diameter is lengthened according as the difference of the first and second expressions exceeds the difference of the second and third. In the case of Venus and Mercury the difference is so slight that we are warranted in doubting such a result as coincidence of revolution and rotation. It must be remembered, however, that mathematica! astronomy has never shown a connection between the elements of

a body and its rotation period. This has always been deduced from observation, and the Italian observer is very confident as to the correctness of his statement. Saturn rises now before midnight and may be beautifully seen in the morning hours. After January 10th the careful observer may note the retrograde motion of the planet among the stars, that motion which so puzzled the ancient students of astronomy. Neptune is also retrograde in the constellation Taurus, and will continue so until the 15th of February, after which his motion is direct. Mars and Uranus are morning stars throughout the month. The former will be very close to β Scorpii, a beautiful double star, on the 27th. A hope has been expressed that the tiny moons of Mars may be seen this year by observers in Canada, as the opposition occurs when the planet is near its perihelion. An occultation by the moon of the 6th magnitude star ϵ Leonis occurs at 11h. 14m. on January 16th, and an occultation of γ Tauri on February 5 at 11h. 18m., approximately. We shall be glad to compare notes with any of our correspondents who may observe these phenomena.

EDITORIAL NOTES.

THE great army of teachers will be entering on their work just as this number of our Magazine comes to them. Let us seek to make the year happy by gladdening the spirit of the learners by bringing into their lives the spirit of the gospel of peace and good will. The spirit of education ever seeks to enlighten, to set free the mind of the child from the narrowing effect of the darkness of ignorance. The teacher unconsciously may thus be the liberator of the scholar. The higher plane of work is that he be a

co-worker of set purpose in this noblest of all labour. So mote it be. Happy New Year to all the readers of THE CANADA EDUCATIONAL MONTHLY.

THE WESTERN UNIVERSITY.

IN London, Canada, for the last ten years there has been in operation a good medical school, whose students have given a creditable account of themselves; there is also a theological school (Huron College) under

the auspices of the Church of England, for the training of young men for the ministry of the Anglican Church. The Western University has a provincial charter from the Ontario Government. Very naturally the citizens of London desire to gather all their educational threads into a bundle, and in the collecting of them they feel the want of, may we say it, the attracting one: an arts course. To supply this important defect an influential meeting was held in London on the 22nd of last month.

The cause of the arts was advocated ably by many well-known speakers; the meeting was large and enthusiastically in favour of immediate action being taken to have the arts course established. The following resolution was adopted unanimously:

The Dean of Huron moved, seconded by Rev. J. A. Murray: "That this meeting views with approval the steps taken by his Lordship the Bishop, the Rev. Principal Miller, the Council of Huron College and the Senate of the Western University to establish an arts course, and pledges itself to raise annually a sum of not less than \$5,000 to be applied exclusively for that purpose, of which sum the Senate of the Western University is to act as trustees."

The request is very modest, the City of London, with its 33,000 population, will have no trouble in providing the \$5,000 annually, and the wealthy County of Middlesex will, no doubt, endow one or two chairs in the Western University.

GOD sends His teachers into every age,
To every clime, and every race of men,
With revelations fitted to their growth
And shape of mind, nor gives the realm of
Truth
Into the selfish rule of one sole race.

—LOWELL, *Rheecus*.

HEED WELL YOUR CHILD.

REV. B. WAUGH.

Heed well your child! Great is its share in
things to come:

The sapling of a future tree,
For you its crop of good or ill,
As now you influence its will,
To eat eternally.

Heed well your child! All bitterness to man
has grown

In youth by some one's fireside.
Untended, selfish and forlorn,
A pleasant toy, or thing to scorn;
Ennobling loves denied.

Heed well your child! A holy or an evil
fate

Was born when its young life began;
A fate to dry or bring the tears,
To awaken or allay the fears
Which shall outlast Time's span.

Heed well your child! Live life before it
kind and pure,

Surround its educating hour
With lights to childhood's instincts sweet,
And warmth in which its heart may beat
And throb with heavenly power.

Heed well your child! 'Tis folly deep, and
deeper shame

To leave to gaze on godless gloom
Its little understanding eye.

Be you its sun, be you its skies;
And save you both the wicked's doom.

Heed well your child! As that is God's
most clear command,

So with the word the help is given
To penetrate its being's core,
Inspiring life for evermore,
To make a child of heaven.

I HAVE laid it down as a rule in my judgment of men, to observe narrowly whether some (of whom one is disposed to think badly) do not carry all their faults upon the surface. And others (of whom one is disposed to think well) do not carry many more beneath it.

—CHARLES DICKENS.

SCHOOL WORK.

MATHEMATICS.

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

ANNUAL EXAMINATIONS, 1891.
JUNIOR LEAVING AND PASS
MATRICULATION.

ARITHMETIC AND MENSURATION.

Hints and Solutions.

1. (a) A number is divisible by 5 when the unit's digit is exactly divisible by 5, that is, when this digit is 5 or 0. A number is divisible by 9 when the sum of its digits is exactly divisible by nine.

(b) Book-work.

(c) Ans. 518.0013+.

2. 1st part, Book-work; 2nd part, $2^3 \times 3^2 \times 5^2 \times 7 \times 11$; 3rd part, factor each number as in 2nd part, then find the product of the Common Factors. Ans. 21.

A.

3. Agent's price = $\frac{3}{4}$ of $\frac{3}{4}$ of $\frac{3}{4}$ of \$256 = \$500.

4. 1st takes 12 sec. to strike 10. 2nd takes $11\frac{2}{3}$ sec. to strike 10. ∴ As they make the 10th stroke together the second clock must have been $\frac{1}{3}$ of a sec. fast.

5. For every \$100 in horse he must insure for \$101 $\frac{2}{3}$. Ans. 4884.

B.

6. 16 $\frac{1}{2}$ mills on \$2250 = \$37.18 $\frac{1}{2}$. Ins. = $\frac{3}{8}$ of \$2000 = \$12.00. Int. on \$3000 at 5 per cent. = \$150.00. ∴ Total expense in 12 mos. = \$199.18 $\frac{1}{2}$ etc.

7. Int. on mortgage = \$120000. Shareholders obtain \$150000. ∴ $\frac{5}{8}$ of annual receipts = \$270000. etc.

8. $\angle I = \frac{1}{188}$ of $\$4^0 = \$\frac{2^2 \times 5^0}{188}$, etc.

Ans. \$961.20, nearly.

9. Total int. = \$20 + int. on eleven payments at 4 per cent. for the various times, viz., 11 mos., 10 mos., 9 mos., etc. = \$20 + int. on \$10 for 5 $\frac{1}{2}$ years at 4 per cent. = \$20 + \$2 $\frac{1}{2}$ = \$22 $\frac{1}{2}$.

10. Income derived from \$100 of bonds = \$18.7296. Income derived from \$100 for 3 yrs. at 7 per cent = \$22.5043. ∴ Price of bonds = $\frac{187296}{225043}$ of \$100 = \$83.22 +.

11. Int. on mortgage at 7 per cent. = \$1012 6935. Interest on mortgage at 5 per cent. = \$709 3125. Or a reduction of \$303.381. Money is worth 3 per cent. less than the mortgage is drawing. Int. on \$100 for 3 years at 3 per cent. = \$9.2727. ∴ To make a reduction of \$9.2727 the amount would be \$100. ∴ To make a reduction of \$303.381 the amount would be

$$\frac{303.381 \times 100}{9.2727} = \$3271.76.$$

C.

12. Area of coin = $\frac{22}{63}$ sq. in. ∴ cub. contents = $\frac{22}{63 \times 16}$ cub. in. ∴ cub. con-

tents of new coin = $\frac{22 \times 5}{63 \times 16 \times 2}$ cub. in.

∴ area of new coin $\times \frac{1}{8}$ in. = $\frac{22 \times 5}{63 \times 16 \times 2}$ cub. in. ∴ area of new coin = $\frac{22 \times 5}{1^2 \times 8}$ sq. in. ∴ r^2 of new coin = $\frac{22}{8}$ sq. in. ∴ $r = \frac{1}{8} \sqrt{5}$.

13. Altitude of right angle = 30 ft., base = 40 feet. ∴ hypo. = 50 ft. = length of canvas from centre of base of tent to top of tent. ∴ area of each side of tent = 50 ft. \times 40 ft., etc. Ans. \$133.33 $\frac{1}{2}$.

14. (a) Volume of lead = $4^3 \times \frac{1}{8}$ of 2^3 cub. in. Volume of silver = same, ∴ volume of new sphere = $\frac{128 \times 11}{21}$ cub. in. ∴ Dia.³

$\times \frac{1}{8} \times 2^3 = \frac{128 \times 11}{21}$ cub. in. ∴ Dia. = $4\sqrt[3]{\frac{11}{2}}$, etc.

(b) Area of surface of leaden sphere = $4 \times 4 \times 2^2$ sq. in. Area of surface of new sphere = $2 \times 4 \times 4 \times 2^2$ sq. in. ∴ Dia.² $\times 2^2 = 2 \times 4 \times 4 \times 2^2$ sq. in. ∴ Dia. = $4\sqrt{2}$ in., etc.

15. Ar. of bottom of mast = $600\frac{1}{2} \times 2^2$ sq. in. Area of top of mast = 196×2^2 sq. in. ∴ $\frac{1}{8}$ of

$\left\{ (600\frac{1}{2} + 196 + \sqrt{600\frac{1}{2} \times 196})^2 \times H \right\}$ cub. in. = 596.75 cub. ft.

∴ $H = \frac{596.75 \times 7 \times 6 \times 1728}{4559 \times 1 \times 12}$ ft. = 71.96 +.

(16) $x = 7\frac{1}{2}$, etc.

CLASS-ROOM.

EDUCATION DEPARTMENT.
ONTARIO.

ANNUAL EXAMINATIONS. 1891.

ENGLISH GRAMMAR.

(Primary.)

Examiners: W. J. Alexander, Ph.D.;
T. C. L. Armstrong, M.A., LL.B.; J. E.
Bryant, M.A.

NOTE.—Candidates may take questions
2 and 3, or questions 13 and 14, but must
take the rest of the paper.

A.

Ye who listen to the stories told,
When hearths are cheery and nights are cold,
Of the lone wood-side and the hungry pack
That howls on the fainting traveller's track,
The lost *child* sought in the dismal wood,
The little shoes and the *stains* of blood
On the trampled snow—O ye that hear!
With thrills of pity or chills of fear,—
Know ye the fiend that is crueller far
Than the gaunt grey herds of the forest are?
Each wolf that dies in the woodland brown
Lives a spectre and haunts the town.
Children crouched in corners cold
Shiver in tattered garments old.
Weary the mother and worn with strife,
Still she watches and fights for life,
But her hand is feeble and her weapon *small*;
One little *needle* against them *all*.
Follow thou when the spectres glide;
Stand like hope by the mother's side.
He does well in the forest wild
Who slays the monster and saves the child:
But he does better, and merits *more*
Who drives the wolf from the poor man's
door.

1. (a) Analyze the first ten lines of this
passage fully, showing the grammatical re-
lation and structure of each clause.

(b) Parse the words in italics.

2. Distinguish the use of: Ye; you; who,
that; O, Oh; each, every; an, one; like,
as; merit, deserve; watches, is watching;
but, yet; woodside, wood-side.

3. Give the derivation of any ten words
in this extract of Latin or French origin.

4. Conjugate *go* in the different forms of
the present, the future and the present per-
fect tense of the indicative mood, and ex-
plain the force of the auxiliaries employed
in each.

B.

Examine each of the following sentences
and suggest any corrections you think neces-
sary, with reasons:

5. The distinction is observed in French
but never appears to have been made in
English.

6. I doubt if this will ever reach you.

7. The exertions of this gentleman have
done more toward elucidating the obscur-
ities of our language than any other writer.

8. Such a work has long been wanted, and
from the success with which it is executed
cannot be too highly appreciated.

9. The colon may be properly used in the
following cases.

10. If I am not commended for the beauty
of my works, I hope I may be pardoned for
their brevity.

11. Words cannot express the deep
sympathy I feel for you.

C.

To sleep! to sleep! The long bright day *is*
done

And darkness rises from the fallen sun.

To sleep! to sleep!

Whate'er thy joys, they vanish with the day;
Whate'er thy griefs, *in* sleep they fade away.

To sleep! to sleep!

Sleep, mournful heart, and let the past *be*
past!

Sleep, happy soul! All life will sleep at
last.

12. Parse each of the words in italics.

13. Illustrate from this poem how adjec-
tives, nouns and adverbs are formed from
other parts of speech and form nouns from
the same root as sleep, long, bright, be,
done, fallen, fade, happy.

14. (a) Explain the nature, kinds and
forms of the infinitive.

(b) Classify the words in italics in the fol-
lowing:

He has a house *to let*. It is, *to let*. He
builds *to let*. He tries *to let*. He told me
to let it. Ready *to let*. *Letting* is *renting*.
Letting may be oral or written. *Renting*
houses is expensive. *Renting* houses are
dear. For *renting* he was praised. For
renting, houses must be in repair.

(Senior Leaving and Honour Matriculation.)

NOTE.—Candidates will take the first eight questions and any three of the last five.

If history has ever furnished a lesson, how an unscrupulous tyrant, who has determined upon enlarging his own territories at the expense of his neighbours, upon suppressing human freedom wherever it dared to manifest itself, with fine phrases of religion and order forever in his mouth, on deceiving his friends and enemies alike, as to his nefarious and almost incredible designs by means of perpetual and colossal falsehoods; and if such lessons deserve to be pondered, as a source of instruction and guidance, for every age, then certainly the secret story of the negotiations by which the wise Queen of England was beguiled, and her Kingdom brought to the verge of ruin, in the spring of 1588, is worthy of serious attention.

1. Show in what respects this sentence is periodic.

2. Point out the chief syntactical error and suggest a correction.

3. In the following compare as to meaning and force the words of the text with the suggested expressions. If history has ever, (if ever, etc.); has furnished, (furnished); has determined, (determined, or was determined); his own territories, (his territories); it dared, (dare, dares, should dare); manifest itself, (assert itself); deserve to be pondered, (ought to be studied); the secret story, (the story of the secrets of); brought to the verge of ruin, (brink of ruin).

4. Criticize and paraphrase the following expressions, expanding each into a sentence where possible:

With fine phrases of religion and order forever in his mouth. On deceiving his friends and enemies alike. By means of perpetual and colossal falsehoods. As a source of instruction and guidance for every age. Is worthy of serious attention.

5. Criticise the whole sentence as to its expression of the author's meaning fully, clearly and forcibly. Rewrite it, beginning with the principal subject, rearranging and dividing it as you please,—making what improvements you think necessary.

6. (a) Explain the nature of the articles, show their origin and advantages, and give rules for their omission and repetition.

(b) Explain the peculiarity in each of the following:

The saint, the father and the husband prays. He returned a sadder and a wiser man. A great many men. Full many a gem. The more the merrier.

7. Trace the history and show the various present uses of who, what, which and whether.

8. Account for our present methods of indicating the number and case of nouns, and give examples of redundancies and specializations in the old forms.

9. Show why the original meanings of the verbs, have, be, can, shall, will, may and do, led to their use as auxiliaries, and how their original meanings have been modified in such use.

10. Discuss the history, the comparative merits and the present tendency of flexion and symbolism in the English language.

11. (a) What principles are to be observed in the employment of figures of rhetoric? Define and illustrate three that depend on similarity or comparison, and three that consist in emphatic repetition.

(b) Discuss the nature and requirements of rhyme, rhythm, metre and stanza.

(c) What are the merits of the iambic pentameter that have led to its prevalence in English literature?

(d) Scan and name the following lines:

“The flesh was a picture for painters to study,

The fat was so white and the lean was so ruddy.”

“Leave the deer, leave the steer,

Leave nets and barges.

Come with your fighting gear,

Broadsword and targes.”

12. Account for and correct what is obsolete in each of the following:

(a) They are they that testify of me,

There's two or three of us have seen strange sights.

(b) Let them take whether they will,

We testify that we do know.

(c) Ye would none of my reproof.

I learn song. I can but small grammar.

(d) The blind man said, Lord that I might receive my sight.

The serpent beguiled me and I did eat.

13. Write a note on the peculiarities of each of the following :

its, brethren, of John's, in our midst, another, foremost, than, nearer, prvoen, listen, could, went, had.

HAMILTON PUBLIC SCHOOLS PROMOTION EXAMINATIONS.

JUNE, 1891.

HISTORY—GRADE 8.

1. Give the principal events of Victoria's reign.

Tell what event took place between 1854-56, and give an account of it. [10]

2. Give the names of the great writers from the Revolution to the present time; telling something about each of them. [10]

3. What is the difference between monarchical, republican and responsible government, and which of the three does Canada enjoy? [5]

4. Who were the Chartists? What were their demands? When did they a second time make trouble and how did it end? [10]

5. Give an account of any three of the following :

Treaty of Paris. Seven Years' War. Reform Bill. Rebellion of 1885. War with the United States. [15]

GEOGRAPHY.

1. Through what bodies of water would you pass in sailing along the coast of Europe from London to Venice? [9]

2. Where are the following places and for what are they noted : The Crimea, Moscow, Waterloo, Rome, Gibraltar, Athens? [9]

3. Name and give positions of the principal islands in the Mediterranean Sea. [9]

4. Name the lands that are separated and the waters that are connected by the following straits: Bonifacio, Dover, Dardanelles, Bosphorus. [9]

5. Trace the following rivers and name any cities that are situated on them: Thames, Rhine, Seine, Danube. [9]

6. Name six important manufacturing cities in the British Isles and tell what they principally manufacture. [9]

COMPOSITION.

1. Supply the necessary capitals and punctuation marks in the following :

halloa he says in a loud cheerful voice what benighted youngster

o is it you mr d says the boy no i am not benighted or at any rate i know my way out of the wood

the man draws back among the shrubs why bless the boy he hears the farmer say to think of our meeting in this way [16]

2. Combine the following into a simple sentence :

Edward had ravaged Normandy. Edward had reached the very gates of Paris. Edward was retreating towards Flanders. Edward was overtaken by the French King Philip. [16]

3. Arrange the words in the following sentences in as many ways as you can without changing the meaning :

Aught unsavoury or unclean
Hath my insect never seen.

Old Earth is a pleasure to see
In sunshiny cloak of red and green. [16]

4. Write a short sketch of the life of Shakespeare, taking the following heads for your composition :

1st. Birth and Parentage. 2nd. Education. 3rd. Life-work. 4th. Lessons to be learned from his life. [16]

5. Write sentences in which the following pairs of conjunctions are properly used :

Neither—nor ; if—then ; whether—or ; as—so. [16]

ARITHMETIC.

1. A cellar is 8 yards wide and 12 yards long. A brick is 4 inches wide, 8 inches long, and two inches thick. How many bricks will be required to cover the bottom of the cellar? [14]

2. A box is 3 feet wide, 4 feet long and 2½ feet deep. How would you show the way to find the area of one end of it? [14]

3. A rectangular half-acre lot 44 yards wide is enclosed by a walk 9 feet wide. Find the area of the walk. [14]

4. If a gallon of water weighs 10 pounds and 25 gallons fill 4 cubic feet; find the depth of 10 tons of water in a rectangular cistern whose bottom is 8 feet square. [14]

5. A wall 18 yards long and 15 feet high contains 90 cubic yards. How many cords of stone would have been required for it altogether if it had been one foot wider? [14]

THE BRITISH NORTH AMERICA ACT.

The preamble of the Act states that :

“The Provinces of Canada, Nova Scotia and New Brunswick have expressed their Desire to be federally united into One Dominion under the Crown of the United Kingdom of Great Britain and Ireland, with a Constitution similar in Principle to that of the United Kingdom.

“It is expedient, not only that the Constitution of the Legislative Authority in the Dominion be provided for, but also that the Nature of the Executive Government therein be declared.

“Also that, It is expedient that Provision be made for the eventual Admission into the Union of other Parts of British North America.”

This last clause having been deemed doubtful or insufficient authority, for the admission of New Provinces into confederation, an act called “The British North America Act, 1871,” was passed by the Imperial Parliament making full provision for the admission of new Provinces and for other matters relating thereto.

Resolution :

“Be it therefore enacted and declared by the Queen’s Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows : ”

Short Title :

“This Act may be cited as the British North America Act, 1867.”

Application of Provisions referring to the Queen :

“The Provisions of this Act referring to Her Majesty the Queen extend also to the Heirs and Successors of Her Majesty, Kings

and Queens of the United Kingdom of Great Britain and Ireland.”

Name of Confederating Provinces :

Provision is next made that the name Canada be given by proclamation to the united Provinces, within six months of the passing of this Act.

Division of Old Canada :

The Province of Canada was divided into two Provinces:—Upper Canada and Lower Canada—named, respectively, Ontario and Quebec.

Boundaries of Provinces, 1867 :

Provision is next made that the boundaries of Ontario, Quebec, Nova Scotia and New Brunswick remain unchanged. This provision is modified by the following :

British North America Act, 1871, clause 3—“The Parliament of Canada may from Time to Time, with the consent of the Legislature of any Province of the said Dominion, increase, diminish, or otherwise alter the limits of such Province, upon such terms and conditions as may be agreed to by the said Legislature, and may, with the like consent, make provision respecting the effect and operation of any such increase or diminution or alteration of Territory in relation to any Province affected thereby.”

List of Provinces, with dates of admission :

1867. Ontario, Quebec, Nova Scotia, New Brunswick.

1870. Manitoba.

1871. British Columbia.

1873. Prince Edward Island.

B. N. A. Act, 1871, clause 4 :

“The Parliament of Canada may from Time to Time make provision for the administration, peace, order, and good government of any Territory not for the time being included in any Province.”

No territory has been acquired by the Dominion Government since 1873.

Decennial Census :

“In the general census of the Population of Canada which is hereby required to be taken in the year one thousand eight hundred and seventy-one, and in every Tenth Year thereafter, the respective Populations of the Four Provinces shall be distinguished.”

The provisions of this clause apply to the whole Dominion.

CONTEMPORARY LITERATURE.

THE January number of the *Overland* is to be the holiday number according to custom.

COPP, CLARK AND COMPANY, Toronto, announce that they have completed arrangements with Messrs. Macmillan & Co., to issue Mrs. Ward's new novel "David Grieve" simultaneously in Toronto with its publication in London and New York.

"AN Experiment in Education" by Mary Alling Aber, in the *Popular Science Monthly* for January, is an interesting account of a method of teaching young children. Many of the articles are illustrated, notably the ones on Pottery and the Musk Ox. A new flying-machine, the Abiator, is described by M. G. Trouvé.

THE Christmas number of the *Illustrated London News* contains an interesting Western story by Bret Harte; a very gruesome ghost story by "Q"; a disagreeable true story by Thomas Hardy, and a charming one by Barrie. The illustrations are quite up to the high standard of the paper, An Equal Footing, the Enchanted Forest and A Christmas Pudding for the Lighthouse especially deserving notice.

THE publishers of the *Dominion Illustrated* have every reason to be proud of this year's Christmas number. The illustrations and contributions are remarkably fine. Especially may this be said of the poetry, "Children of the Foam," by William Wilfred Campbell, excelling in beauty. Beginning with January the weekly is to become an illustrated monthly. All Canadians ought to support a Canadian monthly.

IN the *Atlantic Monthly* for January appears the opening number of Marion Crawford's new serial, "Don Orsino." It promises to be one of the most interesting of his novels. A hitherto unpublished paper by Emerson on Boston will be read eagerly by all lovers of his works. The political Creed of the old South is ably defended by Basil Gildersleeve who himself fought on the Southern side in the Civil War. The names of Henry James, Edith Thomas, Walter Crane and John Stuart Mill are sufficient evidence of the excellence of this number.

"THE Passing of Major Kilgore," a journalistic story, by Young E. Allison, is the complete novel in the January *Lippincott*. Amelia E. Barr contributes a valuable essay on the "Decline of Politeness," and James Whitcomb Riley has a poem entitled the "Guidwife." A new department entitled "As It Seems" begins with this number and contains brief essays on timely topics.

A. B. C. of Swedish Educational Gymnastics. By Hartvig Nissen. 75c. (Philadelphia: The F. A. Davis Co.)

A Short History of the English People. Illustrated Edition. Part III. 1s. (London: Macmillan & Co., and New York.)

Macmillan's History Readers. 1s. Standard III. Stories and Tales from Early English History. (London: Macmillan & Co., and New York.)

The Riverside Literature Series. No. 32. The Voyage and Other English Essays from the Sketch Book. By Washington Irving. (Boston: Houghton, Mifflin & Co.)

Moffatt's Plays of Shakespeare. King Lear. Edited with introduction and notes, arranged and classified by Thomas Page and John Paige. (London: Moffatt & Paige. 2s.)

Thoughts from Earnest Women. Arranged by the Women's Literary Club, Dunkirk, N.Y. (Syracuse: C. W. Bardeen.) A collection of short, pithy quotations, many of them well adapted for memorizing.

Macmillan's English Classics :

Tennyson. Aylmer's Field. With Introduction and notes by Prof. W. T. Webb, of the Presidency College, Calcutta. 2s. (London: Macmillan & Co., and New York.)

Tennyson for the Young. With Introduction and Notes by Alfred Ainger. 1s. (London: Macmillan & Co., and New York.) A collection of Lyrics, Arthurian poems and patriotic poems, selections from "In Memoriam" and Ballads, suitable for children, from the writings of Tennyson, makes an admirable primer or poetry book. Mr. Ainger's work is well done.

Moffatt's Civil Service Examples in Arithmetic. (London: Moffatt & Paige.) 2s. 6d. A good collection of some 1900 questions in Arithmetic, compiled from the Civil Service Examination papers for the last ten years. The answers are given.

The Story of our Continent. By Prof. Shaler. (Boston: Ginn & Co.)

Prof. Shaler's book is a valuable account of the geography of North America in relation to its geology. We can cordially commend it to our readers. There is a good index.

Latin Prose. By A. Judson Eaton, Ph.D., (Leipzig.) (Boston: Ginn & Co.) This work, prepared by Mr. Eaton (of McGill University, Montreal), is a collection of Latin Prose Exercises, based upon Book XXI. of Livy. The notes and references given are of considerable value.

International Modern Language Series:

(1) *Racine. Andromaque.* Edited by Prof. Bôcher.

(2) *Montaigne. De L' Institution des Enfants.* Edited by Prof. Bôcher.

(3) *Molière. Le Misanthrope.* Edited by Prof. Bôcher. (Boston: Ginn & Co.)

Star-Land. By Sir R. S. Ball, F.R.S., Royal Astronomer of Ireland. (Boston: Ginn & Co.) This is a most interesting popular astronomy, being the substance of Lectures delivered by Sir Robert Ball at the Christmastide Juvenile Lectures of the Royal Institution. Anyone might read it with interest and profit.

Lamb's Essays. Selected and Annotated by Elizabeth D. Hanscom. \$1.50. (Boston: D. Lothrop Co.)

A biographical sketch of the life of Charles Lamb opens this volume, and the essays which follow are those of autobiographic interest. This lends a uniqueness to the work, but in itself it is one that will be desired by all lovers of Charles Lamb. The notes are of unusual value as they make clear the frequent references not likely to be generally understood. It is a pleasant book to read and one that will win new friends for its subject.

The International Date Line. By Henry Collins, A.M. (Syracuse: C. W. Bardeen.) 15c. An interesting discussion of the origin and position of the "Date Line"—"the line at which dates must be made later by one day when crossing it from East to West, and earlier by one day when crossing it from West to East." Mr. Collins finds it to be an irregular line, located chiefly in the Pacific Ocean and extending from pole to pole.

Five Short Courses of Reading in English Literature. By Prof. Winchester, of Wesleyan University. (Boston: Ginn & Co.)

A list of useful books to read with biographical and critical references, and advice as to the best editions, etc., is given here. The first is on "Marlowe, Greene, Shakespeare, Bacon, Milton," and the fifth on "Carlyle, Ruskin, Arnold, Browning, Tennyson."

English Words. By Prof. Johnson, of Trinity College, Hartford. (New York: Harper & Brothers.)—Prof. Johnson modestly calls his work "An Elementary Study in Derivations." It is a collection of essays on the literary values of words, showing marked independence of thought and careful research. Remarks on the word-forming instinct, surnames and North American proper names may be specially mentioned. One is repaid for reading it.

The Geometry of the Circle. By W. J. McClelland, M.A. 5s. (London: Macmillan & Co., and New York.)—This is an important treatise on modern geometry for the use of advanced public school students and those taking Honour Mathematics at the universities. Difficult examples being fully worked out and hints given in many cases for other questions, it is probable that those who have an adequate knowledge of the first six books of Euclid and the elementary formula in Plane Trigonometry will be able to master the work here treated of. Mathematicians will find several new features—attention being paid, for instance, to recent developments of the geometry of the triangle. The examples given in this excellent textbook are numerous and well chosen.

Allen & Greenough's Latin Series :

Ovid. \$1.00. (Boston : Ginn & Co. ; New York : The American Book Co.) The selections from Ovid are chiefly taken from the *Metamorphoses*, and a special vocabulary is given, prepared by James B. Greenough. The Series to which this book belongs is well known and appreciated, and we have no hesitation in saying that the scholarship and mechanical execution of this volume leave little to be desired.

Golden Treasury Series : P. ens of Wordsworth. Chosen and Edited by Matthew Arnold. (London : Macmillan & Co., and New York.)—Were it only for Matthew Arnold's beautiful preface, this edition would be the one favoured by many lovers of literature. But the present edition has other things to recommend it. It is indeed a beautiful little book, the poems having been arranged by a master's hand. Arnold, as is well known, found one strong proof of Wordsworth's superiority in the great body of good work which he has left to us—poems which "will in their degree, be efficacious in making men wiser, better and happier."

The Children of the Castle. By Mrs. Molesworth. *The Four Winds Farm.* By Mrs. Molesworth. 2s. 6d. each. (London : Macmillan & Co., and New York.)

Who can tell better stories for children than Mrs. Molesworth? The common sense, absolute truth to fact, loving knowledge of children and finished style of this earnest writer have been observed by everyone who has read her books. Few books will do children more good, and none will be more enjoyed by them. They will be remembered long after they have been laid aside for "older" books. They are the very thing for Sunday school libraries.

English Composition. By Prof. Barrett Wendell, of Harvard. \$1.50. (New York : Charles Scribner's Sons.) Eight lectures given last winter, before the Lowell Institute, Boston, appear in permanent form in this work. Prof. Wendell has been lecturing on such themes, however, for the past ten years at Harvard, so that we have a compression

of his college lectures as well. Students and teachers of English Literature may safely be advised to read this work, and they ought certainly to benefit by doing so, especially in the matter of gleanings suggestive thoughts. We find, however, some eccentricities, and not a few points on which one may take issue with the author. But, for example, his exposition of the general laws of style is admirable, and the book will be received, we are sure, with interest and cordiality.

(1) *The Cambridge Bible for Schools and Colleges.* A General Editor. J. I. S. Perowne, D.D., Bishop of Worcester.

Jeremiah and Lamentations. By the Rev. A. W. Streane, M.A., Fellow of Corpus Christi College, Cambridge. (Cambridge : At the University Press.) 4s. 6d.

(2) *The Book of Psalms.* (London : The Religious Tract Society. 3s. 6d.)

(3) *By-paths of Bible Knowledge—XIII. The Life and Times of Isaiah.* By A. H. Sayce, LL.D. (London : The Religious Tract Society.) 2s.

All the world knows Professor Sayce as a great authority on his special subjects, and the By-paths Series is simply a necessity to Bible students. Who would not like to read what Prof. Sayce says about contemporary monumental testimony to the Life and Times of Isaiah?

The Book of Psalms, published by the Religious Tract Society, is probably the best English reader's Handbook for the Study of the Psalms which has yet appeared. We find an Introduction which deals with the authorship, spirit, contents, use, Messianic character, etc., of the Psalms, then an Alphabetical List, the text, with different renderings and excellent notes, and an Alphabetical Index.

A present interest is given to the three books above mentioned by the fact that they are all on those parts of the Scriptures selected for study in connection with the International Lessons for 1892. We can assure our readers that these are among the very best books on Isaiah, Jeremiah and the Book of Psalms. Jeremiah was one of the neglected books of the Bible, but soon this will all be changed, and Dr. Streane's book is worthy to lead the way. It will take its place at once, the place merited by scholarship, freshness, condensation and clearness of thought and expression as well as decision.