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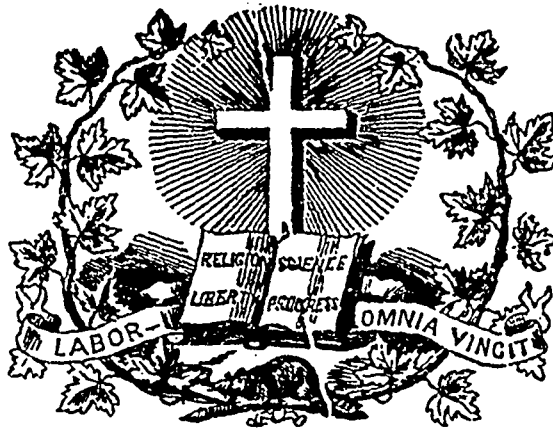
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SUMMARY.—**LITERATURE.**—Poetry: The Garden of Gethsamane.—Deadman's Island.—**EDUCATION:** An Education for Active Life.—Governed Too Much.—Some of the Mistakes of Educated Men.—The Purpose of the School.—A Few Thoughts on the Educational Problem.—A Recipe for Happiness.—How to Win a Child's Heart.—Vacation.—Denominate Numbers.—**SCIENCE:** Description of an Ancient Sepulchral Mound near Newark, Ohio.—On the Velocity of Nervous Impressions.—Are there Other Inhabited Worlds?—**OFFICIAL NOTICES.**—Appointments: School Commissioners.—Diplomas Granted in McGill Normal School.—Diplomas granted by Boards of Examiners.—**EDITORIAL:** Fête of the Pupils of the College of Nicolet.—Public Instruction in Nova Scotia.—Twenty-ninth Meeting of the Teachers' Association in Connection with Jacques Cartier Normal School.—McGill Normal School.—McGill Model School.—Convocation of Bishop's College.—Educational Convention.—Teachers' Association of the District of St. Francis.—Report of the Annual Meeting of the District of Bedford Teachers' Association.—St. Francis College and Grammar School, Richmond, C. E.—**MONTHLY SUMMARY:** Educational Intelligence.—Scientific Intelligence.—Literary Intelligence.—Neurological Intelligence.—Miscellaneous Intelligence.—**ADVERTISEMENTS:** McGill University.—McGill Normal School.

Garden of Gethsemane! the God-like lesson then
Left as precious token to suff'ring, sorrowing men,
Has breaking hearts oft strengthened, that else so sharply tried
Would quick have sunk, or hopeless, have cursed God and died.

Garden of Gethsemane! when "pressed and sore afraid,"
May I in spirit enter beneath thy olive's shade,
And however great my anguish, still like that God-like One,
Submissive say, "oh Father! Thy will not mine be done!"

WRITTEN ON PASSING DEADMAN'S ISLAND, (1)

IN THE GULF OF ST. LAWRENCE, LATE IN THE EVENING, SEPTEMBER, 1804.

See you, beneath yon cloud so dark,
Fast gliding along a gloomy bark?
Her sails are full,—though the wind is still,
And there blows not a breath her sails to fill!

Say what doth that vessel of darkness bear?
The silent calm of the grave is there,
Save now and again a death-knell rung,
And the flap of the sails with night-fog hung.

There lieth a wreck on the dismal shore
Of cold and pitiless Labrador;
Where, under the moon, upon mounts of frost,
Full many a mariner's bones are toss'd.

Yon shadowy bark hath been to that wreck,
And the dim blue fire, that lights her deck,
Doth play on as pale and livid a crew
As ever yet drank the churchyard dew.

LITERATURE.

POETRY.

(Written for the *Journal of Education*.)

THE GARDEN OF GETHSEMANE.

BY MRS. LEPROHON.

The place is fair and tranquil, Judea's cloudless sky
Smiles down on distant mountain, on glade and valley nigh,
And odorous winds bring fragrance from palm tops darkly green,
And olive trees whose branches wave softly o'er the scene.

Whence comes the awe struck feeling that fills the gazer's breast,
The breath quick drawn and panting, the awe, the solemn rest?
What strange and holy magic seems earth and air to fill
That wordly thoughts and feelings are now all hushed and still?

Ah! here, one solemn evening, in ages long gone by,
A mourner knelt and sorrowed beneath the starlit sky,
And He whose drops of anguish bedewed the sacred sod,
Was Lord of earth and heaven, our Saviour and our God.

Well may mournful whispers breathe from olive leaf and bough,
They fauned His aching temples, His damp and grief-struck brow;
Well may the soft winds murmur with low and grieving tone,
They heard His words of anguish, they heard each sigh and moan.

Alone in deepest agony whilst friends—apostles slept,
None to share His vigil—weep with him whilst He wept,
Before Him clearly rising the Cross—the dying Pain—
And sins of hosts unnumber'd for whom He'd die in vain.

(1) "This is one of the Magdalen Islands, and, singularly enough, is the property of Sir Isaac Coffin. The above lines were suggested by a superstition very common among sailors, who call this ghost-ship, I think, "the flying Dutchman."

"We were thirteen days on our passage from Quebec to Halifax, and I had been so spoiled by the truly splendid hospitality of my friends of the *Phaeton* and *Boston*, that I was but ill prepared for the miseries of a Canadian vessel. The weather, however, was pleasant, and the scenery along the river delightful. Our passage through the Gut of Canso, with a bright sky and a fair wind, was particularly striking and romantic."

We may add that Deadman's Island is a rock forming part of the Magdalen Islands in the Gulf of St. Lawrence. It also bears the name of *Corps-mort* (Dead body), from its resemblance when seen at a certain distance, to a corpse floating on the surface of the water. It was when passing this island, in September 1804, that Moore composed these verses. A French translation of them by Mr James Donnelly, of the college of St. Thérèse, will be found in the June number of the *Journal de l'Instruction Publique*.

To Deadman's Isle, in the eye of the blast,
To Deadman's Isle, she speeds her fast;
By skeleton shapes her sails are furled,
And the hand that steers is not of this world!

Oh! hurry thee on—oh! hurry thee on,
Thou terrible bark, ere the night be gone,
Nor let morning look on so foul a sight
As would blanch forever her rosy light!

EDUCATION.

An Education for Active Life.

Have we not here, the title of, to some extent, an unsolved problem? It is pretty generally conceded, we suppose, that the old classical curriculum of our colleges does not furnish a solution. As little, we think, does the scientific course of a Polytechnic school, based, as it necessarily must be, so largely upon mathematics as to be quite too one-sided and technical to answer the general purposes of young men not intending to devote themselves to scientific pursuits.

We have heard it gravely maintained that there *can* be no education that deserves to be called liberal, save one based mainly either upon philology, and embracing the ancient languages, or one based mainly on mathematics, and carrying its pupils very far into their abstruser recesses. It is sometimes assumed that when an education, different from either of these is sought, it is for the sake of avoiding labor and gaining the name of an education without paying the price of hard and persevering study. We are pointed to the so-called "Business Colleges," as the type of what education will be reduced to, if we "emasculate" it by leaving out that only which constitutes its disciplinary value—a hard training either in philology or mathematics.

We believe we are ready to go as far as any one in upholding the necessity of the "disciplinary" element in all true culture. We abominate the notions of that vulgar type of the practical man who can see no use in anything that cannot be immediately reduced to a bread-and-butter value. It is an abuse of terms to call such men practical. Nothing truly valuable, even of the kind they can appreciate, will ever be accomplished by thus narrowing and belittling the sphere of education. But while we hope we thoroughly appreciate the value of mental discipline, we think that classical scholars on the one hand, and mathematicians and physicists on the other, are very much disposed to look upon their own as the only possible avenues for attaining it. Is it true that every study outside the pale of philology or mathematics, must, of necessity, be shallow and superficial? Has a young man who, not looking to the future either of a learned profession on the one hand, or a technical scientific pursuit on the other, no alternative but to borrow the training of the one or the other, though he knows he is never going to use it? Suppose him to have a positive inaptitude for mathematics—must he be thrown into the arms of a Greek professor, or go sadly through life without any higher education? Suppose him to have no sort of fondness for Greek vocables—must he study the Calculus, or fall back on a "Commercial Academy"?

This is a very vital and a very practical question for an increasing number of young men in this our active American world. Shall they accept one of these perhaps equally distasteful alternatives, or shall they go without any higher education beyond what a school can give them; or is there a *tertium quid* which is equally entitled to be considered a disciplinary and liberalizing mental training? We have said that the problem is an unsolved one. We know of no recognized and successful course of higher study, distinct on the one hand from the classical course of our colleges, and on the other, from the mathematical and physical course of our polytechnic schools; but we are very sure that such a course is possible, and we trust it will not be long before it will somewhere or other be realized. Practically, indeed, the course

of study of many of our colleges is made to conform more and more to the real wants of the pupils by partaking more and more of this character. History, Political Economy and other English studies—even the English and Anglo-Saxon languages—on the one hand; modern languages and the natural sciences on the other, are disputing with more and more success the time-honored monopoly of the classics inside the college doors. The practical difficulty consists in the tremendous price to be paid in order to get inside those doors, in the devotion of four to six of the best years of boyhood to the technical mastery of Greek and Latin. In polytechnic and scientific schools, on the other hand, the natural and almost unavoidable tendency is to give too great a preponderance to that strictly mathematical course without which as a foundation no successful progress can ever be made in the higher branches of physical science and the arts appertaining to them.

Now it would be absurd to attempt to construct any course of education that should deserve to be called liberal without the admission both of philology and mathematics as essential and fundamental ingredients. The only questions are, Are they the *only* possible ingredients, and if not, to what extent should they be displaced by, or in what proportion should they be mingled with, other studies? A mixture of ingredients that would suit exactly one class of minds and answer perfectly for the attainment of one practical purpose may be wholly unsuited to another class of minds or a different object; and though it is of course quite impossible to meet all the varying shades of mental character by corresponding variations in mental training, and undesirable if it were possible (though we think that in our ordinary methods we do not consult these natural differences and aptitudes enough); yet there are certain broad lines which the future careers of men mark out and for which it is impossible to provide even in their early training.

Now, the divine, the lawyer, the scholar by profession, should early begin and thoroughly study philology as a mental training. The scientific engineer, whether civil or military, the architect and the builder, must begin early and carry very far a most thorough mathematical training. The chemist and the naturalist must cultivate his observing powers from his youth upward, and study early and late the philosophy of induction. To these last *we* would add the medical man, for we believe it would benefit him far more than Greek grammars; and perhaps the reason why medical science makes so little progress, and is a prey to all manner of quackeries is, that it is but just beginning to emancipate itself from mediæval superstitions, and place itself where it belongs among the sciences of observation and induction.

But now comes the great army of youths—and in this young country of ours what an army it is!—destined for none of these callings, but who are to enter the various walks of business, and who desire before plunging into the whirl of active life to give themselves a *real* education. Is it absolutely necessary that they should be forced on the one hand to read the Greek tragedians, or on the other, to penetrate (hard fate!) the mysteries of the Integral Calculus, or else be handed over to the classic shades of a "business college"? (1) We think not; but that a higher education may be devised for them too. Let us try to give some hints—and they can only be hints—in regard to the elements that should go to make up such an education.

Certainly they should study language, but to study language is not necessarily to study Greek. Cannot a thorough *discipline* in language be obtained from the study of the mother-tongue—with more or less (we should incline to the side of the *more*) of Latin and Anglo-Saxon along with the *thorough* study of one or more modern languages of the same family? Cannot the pupil's æsthetic taste then be cultivated by carrying this study into the classic writings of his own and other modern languages as carefully and thoroughly as the classical scholar pursues the same

(1) We desire to speak with great respect of "business colleges." They are useful institutions, and many of them are admirably managed—but we are here speaking of Education.

studies? Will not Shakspeare do instead of Æschylus, and Dante stand instead of Homer, and Spencer and Ariosto take the place of Virgil?

So, again, such young men should study mathematics—who can doubt it?—and study them with that thoroughness which is absolutely necessary in order to get from them their disciplinary value: would that such thoroughness were more common! But *how far* should they go? The field of mathematical investigation is boundless, and it is clearly a minority, and not a majority, of human minds that are capable of pursuing its higher walks successfully. For practical purposes the future merchant will never need the calculus; unless, indeed, modern fortunes are to be classed under “indeterminate forms” and “independent variables,” but we fear no calculus has yet been devised to estimate *their* fluctuations. Let our young business man then stop short of these mysteries:—this need not imply that he is to be superficial in what he does learn,—and give up the vain attempt to force his mind upon paths which nature never meant it to tread successfully. So, again, if we apprehend the matter rightly, a minimum course in physics and in chemistry can well be laid out corresponding to this limited mathematical training, which shall yet give its recipient most excellent discipline of his observing and reasoning powers, and make him master far beyond the point now generally attained, of the great facts of physical science, and of the philosophy of induction in which they are a training.

But now come in certain other studies quite necessary to be attended to by our practical men, and which, *rightly* attended to, may be made to have a disciplinary value as truly as any of those we have enumerated. In truth it is a mere superstition to suppose that any studies have a monopoly of disciplinary value. The disciplinary value of a study consists not so much in the nature of the study itself as in the manner in which that study is pursued; and viewed in this light, *all* studies may be disciplinary, or the very reverse of disciplinary. To what percentage of the students in our colleges have the higher mathematics any mental value, as the study of them is usually pursued? On the other hand, though History may be made a mere concatenation of lifeless events, can it not be studied so as to bring into action a great many of the students' best powers? Do not mental and moral philosophy furnish a training which can be followed quite independent of that knowledge of classic verbal niceties which is so apt to make word-mongers and hair-splitters, and men of barren formulae, instead of thinkers? Again, does it not behove the young citizens of a free republic to begin betimes the philosophic study of those laws they are to live under and help make, or shall we always be left a prey to the sophistries of legal demagogues? Will any one undertake to say that in the study of law, rightly pursued, there is no mental training? or that all the law must of necessity be confined within the walls of a few technical law-schools? In our view, the more widely a sound knowledge of its principles is spread as a part of a general education, the less need there will be of multiplying those law-schools and all the endless technicalities on which they depend for their existence.

And finally, and more important to the business man than all the rest, why should not the laws of this very business be made to yield a discipline to his mind? Is not political economy a recognized and a difficult science? Has not trade its laws? and in the multitude of products with which the merchant deals, in their nature, the laws which govern their production, and the processes which enter into their preparation, for the uses of man, is there not a boundless field for the highest exercise of the mental faculties, and for an education which is all the more valuable for not stopping when the doors of the college are left behind, but for furnishing the materials for a mental discipline which need end only with life? If we would relieve trade from the reproach which now attaches to it of being pursued only for low and mercenary ends, we must raise up a generation of *educated merchants*—of men educated not *from* but *for* their profession, who will not look down upon their own calling, but

will compel others to look up to it, through the liberal and enlightened spirit in which they pursue it, and the proof they give that its pursuit is consistent with, and may be made a true element in a really *liberal* culture.

We have left ourselves no room to speak of art, and its claims to be considered an integral element in *all* liberal training. We can only say that we see no inconsistency in a study of the fine arts being made a part of the education for the most practical of practical pursuits. Indeed, such an ingredient is needed there more than anywhere else, to give balance and proportion.

We have thrown out these hints on a wide and very important subject. We wish some abler pen than ours would pursue it farther.—*Massachusetts Teacher.*

Governed too Much.

As an aphorism, this applies to school-keeping as to the business and affairs of life. Some teachers are always governing. Their codes of rules and regulations are ample enough for an ordinary State; and much of the time which ought to be devoted to teaching the rudiments is often worse than wasted in watching for and punishing the violation of some article of these codes. Others go on, day after day, without a jar or a discord, with no other body of laws to guide or restrain the pupil than the common law of right and wrong, which a pupil readily learns to understand and apply, and, in doing so, often feels that he has a share of the responsibility for the condition of the school, if the teacher will, on his own part, show him a practical lesson by example. If the teacher will satisfy his pupils that he is interested in the purposes of the school; if he will be courteous in his firmness, and gentle in his severity; if he will be just and impartial in his judgments, and will throw life enough into his lessons to excite the interest and attention of his pupils, he will have little occasion to make laws against disorder in his school, or to apply the whip or spur to the dull laggard of the class. Make a pupil feel that he has an interest in what is going on, that teaching is not a mere abstract mill-horse round, which a boy has to go through because others have done it before him, and the teacher need no longer drive him; he may lead him as a cheerful, a willing follower. We have heard teachers gravely discussing in their Institutes and Conventions whether, and how far, corporal punishments should be applied; and we have wanted to say, “My dear sirs, if you will only govern yourselves, if you will only carry into school the spirit of a teacher, and apply to the children there the same simple rule of common sense towards them as you do to your neighbor when you meet him, and undertake to tell him what you saw in town yesterday, or what you read in the newspaper this morning, you would have as little occasion to complain that your pupils are stupid and indifferent as you have that your adult friend will not listen to your narrative.” The child is the parent of the man, and if one would get at his heart or his brain, he must approach them by the same avenue in childhood as in manhood. It is idle, however, to think of applying the same rules of order, quiet, and attention to a little bundle of nerves and muscles acting by an uncontrollable law of nature for activity and motion, as to the adult man sobered by experience and disciplined by exhausted energy. And the teacher who is greatly disturbed by an occasional restlessness of childhood, or the outgushing at times of a joyous spirit, had better discipline himself, than hope to overcome the irrepressible laws of nature by any code of rules which he can prescribe for his school.

But the subject does not stop with the government of schools. It reaches the State, and deserves a moment's notice as bearing upon the system of civil polity under which we live. The simple truth is, that the nation is not yet half weaned from that old traditional notion in which our ancestors were educated, of being governed by somebody besides ourselves, and of looking up to some governing power to correct every evil and promote every good. It is moreover a relief to their feelings of discontent if they can throw the blame of misgovernment from off themselves upon the powers that be. That was the way in which things were practically managed in the mother country, during the time of the Tudors and the Stuarts; and, free as we were while a British Province, the idea was ever present that, away across the water, was the seat of that power to which, ultimately, the political action of the people was subordinate. Nor do the people yet seem to have found out, that they themselves are the government, that the functionaries who make and execute the laws, are their servants and agents, and that no law can be carried or enforced against the decided sentiment of the people. This subordination of the people to a government may be best illustrated by referring to

the condition of France to-day. I cite a passage from an oration of Mr. Felton, of California, in speaking of the social condition and opinions of the different nationalities of that State: "If you compare the American with the citizen of that great country, France, so wonderful in all departments of manufacture, art and science, you will see why it is that the American is so much at home in a new country. In France the subject has had no hand in framing or making the law. A code adapted to every want of life regulates the minutest details of every relation. The Frenchman addresses himself to the law, to punish every little injury. It regulates for him his business and family relations. It goes with him to the market, and woe to the butcher who sends him the wrong piece of beef, or the baker who commits an error as to the number of ounces it takes to make a pound. It escorts him home, and sees that the porter lets him in and does not scold him for being out so late. If his wife, tired of the conjugal domicile, seeks variety in absence, the requisite number of constables conduct her back to the loving arms of the spouse." This witty, though, it may be, slightly exaggerated picture of French life, has so much of what is known by every Frenchman to be true, that it serves as an example of a people being over-governed, and yet acquiescing because they have been educated to a traditional reverence for the government. Now, though we have no such state of guardianship over the people here, we have such an instinctive reverence for law, that we often mistake in appealing to the law as a means of accomplishing that which can be effected only by what gives life and vigor to any law in a free government—the will, judgment and sentiment of the people. The consequence is, that we have ever so many laws upon our statute books, which are a mere dead letter. There is a prevailing evil in the community. It is something which concerns all, and can only be removed or suppressed by the combined action of all. What do we see done again and again? It will take time, cost money, and occasion trouble and inconvenience to individuals to grapple with the evil themselves. It is easier to put it under the ban of the law. And so the officers of the law are called in to suppress it, and men look to the government—an emanation from the people—to do what the people themselves shrink from attempting to accomplish. The good citizen goes daily by the grog-shop to which he sees the drunkard resorting, and, without expending a word of expostulation upon the author of so much ruin, wonders why the law will tolerate such a nuisance, and throws off his responsibility upon the shoulders of the government. It is not that such a law is not well enough. It is that we associate with it some interposition from some quarter to carry it into effect. And we call upon the law-making power as the people of the despotic governments of the old world do in respect to their laws, and are surprised when we are told that we are calling upon ourselves to do as the governing power what each individual shrinks from as an irksome and uncomfortable duty.

The same may be said of sustaining institutions which owe their support to the aid of the law. Mere statutes do not make good highways, or build school houses, or employ teachers. The most they can do, is to declare what the duty of the citizen or the community in this respect is, and provide the means of its execution, and then to leave it to the citizen to apply these means with effect. If, on the contrary, it undertakes to do the work itself, to supply the various details which enter into the execution of its provisions, its effect is to relieve the citizen from his responsibility, and to attempt to accomplish by the formula of a law what can alone be reached by the exercise of moral power. Take the case of our schools. Suppose each town and district were to do just what the letter of the statute requires,—raise just the requisite amount of money, keep a school just the prescribed number of weeks or months in a year, hire the cheapest man or woman who can pass the requisite examination by the committee of the town, and do just enough to escape indictment for violating the letter of the law, what would soon be the condition of our schools, and how long would it be before, in the downward course of a people, educated in them, the law itself would grow degenerate too? It not only requires that the people should, in the first place, be willing by good laws to furnish proper means and facilities for establishing and maintaining schools, but, as a far more important element of success, it requires a heart and a will on the part of the people to apply these. The efforts of one such man as the late Dr. Bigelow, of Newton, in looking after the management of schools, and keeping alive an interest in their favor by his example, are worth a whole volume of statutes which only here and there one reads, and which seek by penalties and punishments to infuse animation into a torpid community. What but the generous zeal of gifted and intelligent minds operating in different localities in the Commonwealth, has raised our schools to their present condition? As types of public sentiment, statutes are most valuable and encouraging. But if public sentiment is not substantially up to what these statutes symbolize, they fall dead and become powerless. Our schools are

flourishing because the people have been growing willing to take them into their own charge. They have learned to treat their teachers as members of a liberal profession, and to follow their lead in adopting improvements and reforms. And they cherish a generous pride in these schools as something with which the honor of the State itself is identified. The explanation of all this is, that the people of Massachusetts have been educated up to this sentiment by the friends of the system after years of untiring efforts. And we devoutly trust they will never be betrayed into the folly of putting their schools into the charge or keeping of any other power.

AN OLD SCHOOLMASTER.
Massachusetts Teacher.

Some of the Mistakes of Educated Men.

"My first advise to young men pursuing or completing a course of liberal studies is, to take care of your bodily health. Without this your intellectual attainments will be shorn of more than half their value. I dwell upon this point, and emphasize it, because on every side of me, in professional life, and especially in the clerical profession, I see so many helpless wrecks. Verily there is some grievous mistake among us in this matter. Whether it be our climate, or our habits of student life, or our social and domestic habits, I am not prepared to say. But of the fact I make no doubt. Our educated men do not achieve half that they might achieve for the want of the necessary physical vigor. It is painful to see the dyspeptic, sore-throated, attenuated, cadaverous specimens of humanity that student-life so often produces among us—men afraid of a puff of air, afraid of the heat, afraid of the cold, afraid to eat a piece of pie or good roast beef—men obliged to live on stale bread and molasses, who take cold if they get wet, who must make a reconnaissance of a room to see that they can secure a place out of a draft before they dare to take a seat—men who by dint of coaxing and nursing and pampering drag out a feeble existence for a few short years, and then drop into a premature grave—martyrs to intellectual exertion!

"I do not recommend the fox-hunting carousals of the old time English clergy. We need not go back to the material apotheosis of the classical ages. But verily we have something to learn in this matter. We have to learn that high mental exertion taxes most severely the life-force. We have to learn that the man of superior intellect, who puts forth his power with resolute vigor, requires more bodily health and force to sustain the strain than an ordinary laboring man does. Instead of being pale, delicate, feeble, and sickly, the student needs to be stalwart and hardy. He should have tougher thews and stronger sinews, and a more vigorous pulse than the man who merely plows the soil. He need not have the brawn and bone of the athlete and the gladiator. He need not be a Spartacus or a Heenan. But he should be of all men a man of good, sound, vigorous, working bodily health."

He then passes to the importance of the habit of being beforehand in whatever you undertake, to the necessity of holding on to the calling one chooses, to the value of some fresh intellectual acquisitions every day, to the beneficial effects of a varied and liberal culture apart from one's speciality, and the propriety of cultivating the art of conversation. On the latter head he says truly:

"Excuse my dwelling a little on this point. There is among our best educated men, I am sorry to say, a large amount of *vis inertiae* in regard to this matter of conversation. Very many such persons are disposed to rely for their success and their position in society solely upon their professional skill and industry. General conversation is a bore to them. They have never duly considered the advantages it might bring them. They are disposed to leave all that to those more ambitious of social distinction. When they are in company, they speak, indeed, if appealed to, or if it comes entirely in their way to do so, but they feel no responsibility for keeping conversation afloat. Allow me to say, gentlemen, this is all wrong. Independently of all considerations of interest and policy, there is a clear duty in this matter. Every man who mingles in the society of his fellows is bound to contribute his quota to the common entertainment, just as much as in a joint excursion of any kind he would be bound to pay his share of the reckoning. Educated men, beyond all others, should settle it as a clear duty to learn how to talk well in company. Conversation is an art; but it is an art which can be acquired, and depend upon it no acquisition gives a surer or more ample return for the amount of effort needed."—*New York Evening Post*.

The Purpose of the School.

I find that the defects of conscientious teachers are for the most part to be traced to the want of a purpose, both as regards the general object of the school and the particular result of special studies.

"What is it that I propose to myself in School keeping?" is the first question which a young teacher should put to himself. His first duty is to form a purpose or practical ideal. A clearly defined purpose is not only the indispensable condition, but it is also the measure of progress. The question is, as it seems to me, best answered thus:—The object which the Schoolmaster ought to propose to himself is the Formation of Character. This is the ultimate purpose of the Parochial Schools, as it is of all education.

It is true that the objects of education, and even of such education as the parochial school affects to give, are, in their details, various, and seem at first sight inadequately summed up by the words "Formation of Character." The child, for example, has to be taught how best to preserve through life a sound mind in a sound body. In teaching him this, we must furnish him with the knowledge necessary for earning a livelihood; we must provide him with a certain amount of intellectual food; and above all, we must instruct him in those moral duties which it behoves him to know and practise. The moral teaching, again, can have due efficacy and adequate sanction only if we connect it with the will of the Unseen Power which sustains and administers the Universe: it thus becomes religious teaching, and this long before it assumes that more definite form of Christian faith which the school also inculcates. The necessities of the case thus demand that the pupils' mind shall be *informed* as well as *formed*.

But what is the purpose of all this instruction? It is to make men lead better lives; better intellectually, by giving greater activity, vigour, and precision to the powers by which they know and do; better, morally and religiously, by causing them to live in obedience to the laws of God as revealed in the nature of man and the visible order around him, and in harmony with the will of God as communicated in his Word. The bettering of men's wills, and the bettering of men's intellects, these are the great objects which we have in view.

Accordingly, if asked to sum up in a few words the end of Education, and to do so in words which will indicate its ultimate aim at the same time that they furnish the practical teacher with a criterion by which to measure every detail of his work, I can find no better or more exhaustive answer than that which has been given—"The Formation of Character."

But since the invigorating of the understanding, and the training of the will, are operations which cannot be conducted without materials, we are bound, in determining the nature of these materials, to allow ourselves to be controlled by the needs and facts of man's daily life.

The materials of parochial school education thus forced on us are at first sight so humble that it may with some show of truth be contended that they do not admit of a treatment in relation to a larger purpose outside themselves. If this be so, they are unsuited to the work they have to do, and the Schoolmaster, since no other material is available, inevitably sinks into a mere mechanic. This antagonism happily does not exist. The necessities of the pupils' future life, and the necessities of sound training, can easily be shown to harmonize. For, although in such formal matters as arithmetic and grammar the ideal may mean only a certain perfection of acquired knowledge in the pupil, accompanied by a certain amount of mental power developed in the process of acquisition; yet, when even these subjects are ethically taught—that is to say, so handled as to be brought into close concrete connexion with their ultimate uses in common life, they pass into a higher category, and contribute their full share to the attainment of the ultimate purpose of the school. In the elementary school, if nowhere else, purely formal studies have, when rightly understood, a moral significance.

If the purpose of the parochial school has been correctly stated, something has already been done towards defining the position

and work of the Schoolmaster. If it be true that he is set apart by society, in order that he may direct his daily energies towards the formation of character in the children of the people, he cannot fail to feel that he is engaged in an elevating, and inspiring, nay, more, a *creative* task. He is in truth, if he will but believe it, a kind of moral artist. He has a plastic work to do—the work of moulding the rude untutored nature of peasant and city boyhood into a shapely form. Nor will any one regard this as an exaggeration of the teacher's office, who has had opportunities of contrasting the uncombed, untamed barbarian of civilisation, distinguished for his loose and insolent carriage, his lawless manner, licentious speech, and vagrant eye, with the same child, sitting on the school-bench, well habited and clean, his manner subdued into fitness with the moral order around him, his tongue under a sense of law, his countenance suffused with awakening thought—his very body seeming to be invested with reason. That such transformations are effected by the best Schoolmaster, all know who have come into direct personal contact with educational agencies. And surely the man who can point to such results as the product of his labour, rightly claims to have in some sense a creative function. Is not his work, in point of fact, creative in a high and peculiar sense? This at least is certain, that, except in so far as it is felt by him, consciously or unconsciously, to have this character, it may be safely said to be a drudgery the most dreary and soul tiring in the whole round of human labour—an occupation for slaves.

I speak exclusively of the elementary teacher; for the departmental instructor in this or that science or language stands on a lower moral eminence than that which is occupied by the parochial Schoolmaster. The former makes only a partial contribution to the final result of character, and he does so at an age when the pupils' unconscious moral tendencies are already declared, and the bent of his intelligence is already given. The latter, on the other hand, has to rear successive generations of children, during the years in which they are most open to impressions. These children he has, in the widest sense, to train as well as to instruct. His duty is to operate on their faculties and capacities, to stimulate these into life, and to give them their first direction. The intellect of the child is thus dependent on its earliest instructor more than on any other—on his wise understanding of the manner of its natural operations, the limits of its legitimate exercise, and the objects most readily seized and assimilated at the different stages of its growth. Still more is the moral destiny of the child in his hands; for the extent to which the sentiments and imaginations are to enter into the future character, and give it balance and harmony, depends more on the way in which they are respected and judiciously fostered in the child's earliest years, than on any future influences whatsoever.

If this be the work of the national Schoolmaster—if his function be to elaborate out of rude but not unpliant material, some approximation to a good intellectual and moral habit, how indispensable is it that he should be guided as well as sustained by the conscious possession of this the ideal aim of his profession! It is only when he has a clear comprehension of the real nature and the large bearings of his work, that the little things of the schoolroom—and it is precisely these that require his attention—assume their rightful importance. All the details of his arrangements are then felt to promote or retard the realization of the educative purpose of the school, and, in so far as they contribute to the final result, to have a moral value. Small things are no longer petty. Things which would be otherwise considered trivial—such as cleanliness, order, light, ventilation—acquire a new significance. Those daily incidents, so apt to be regarded as merely harassing and vexatious, and as traversing the steady onward progress of his work, are now beheld by him in a new light, and what were formerly only obstructions, become transmuted into auxiliaries of his general method, or into felicitous opportunities for applying it. The teacher, on the other hand, who is ignorant of the true nature of his function, and is unfurnished with a practical ideal, can at best take only a partial and technical view of his duties. His various classes and subjects

of instruction do not present themselves to his mind as parts of one whole. The organization is probably loose and disjointed, the subjects taught and the classes operated on seeming to have no intimate connexion with each other; for where no ultimate unity of general result is conceived, none can exist in the particular details. The multifarious operations of the schoolroom hang in clumsy juxtaposition, instead of being woven together by the power of a common purpose. Such a teacher looks at his work piecemeal, and does it in fragments. A portion of this, that, or the other subject, has to be taught to a certain number of pupils, and the day's work is over. Each lesson seems to terminate in itself, without reference either to the past or the future; to-day seems to have no necessary issue in to-morrow. Every passing event, every collateral circumstance attending his intercourse with his pupils, is to such a man obstructive and irrelevant, if it do not forward the sole object of the day—"Getting through the lessons." That done, the day's duty is also done: and we may be sure that where the teaching is not animated and controlled by any higher purpose than this, by something which can neither be questioned out of the pupils nor communicated to them in didactic shape, even the mere lesson-saying will be perfunctory and barren.

But not only are the possession of an ideal, and of the desire to attain it, indispensable qualifications of a primary teacher; they also point out the easiest and shortest road to his end. They may almost be said to supersede every other qualification; for where there exist the imagination and the precision of apprehension necessary to give definite shape to the final aim of his work, and along with these the will to realize in his school what he entertains in his thought, the teacher may almost be said to be fully equipped for his task. So equipped, he cannot wander very far from the right track, and, should he deviate, his errors will quickly turn to use. Even the principles of organization and of discipline, and all scholastic method, are of little value compared with a distinct conception of the ultimate aim of the school sustained by an earnest purpose. These things, if they are not quickened by the independent thought of the teacher, deal with the scholastic art from the outside, while the teacher we have in view has already a firm grasp of a central idea which not only gives validity and force to the methods which he may adopt, but is itself the fertile source of new expedients.

Again, the possession of a practical ideal enables the teacher to give fair proportions to the various parts of his work. The subjects to be taught, their relative importance, the limits within which they are to be kept, and the direction which is to be given to them, can be determined only by the help of the foregone purpose.....

Further, the possession of the school-ideal sustains and animates the teacher. Without unduly magnifying his office, he feels a just pride in the reflexion that he is one of the moral agencies of society. The knowledge that it is his special duty to aid in forming the character of others, is a never-failing source of strength. It is well that it should be so; for in no profession or occupation is there more need of the consolation which a high purpose gives. The teacher is denied the fresh source of courage and hope which a completed work so often yields to other labourers. He is constantly toiling towards an intellectual and moral unity of result which he never reaches. He is always producing, but there is never a completed product. His fondest hopes are being constantly frustrated; weakness, folly, wickedness cropping out where and when least expected, breaking down his most cherished beliefs in his success, and undermining his best laid schemes. Even his successes it is seldom given him to know, because the pupils pass out of his hands before the fruit of his training is visible. Harassed by petty exactions, and unrefreshed by the reward of generous recognition, he is often depressed, if not despairing. In such circumstances it is manifest that he can find renovation of zeal in the magnitude and moral aim of his professional task, and in the trust that he is humbly co-operating with a higher Power in whose hands are the issues. — *Laurie's Report.—Papers for the Schoolmaster.*

A Few Thoughts on the "Educational Problem."

The principles which I have thus tried to elucidate, have a practical exemplification in this day's exercises. The roots of all that we have heard and been delighted with, run back under the soil of years of disciplinary culture and training. The graduating essay is but the resultant of preceding lessons and native talent. What these pupils are in thought, feeling, impulse and purpose, is the fruit of every preceding hour's wrestling with truth, of every past self-denial, of every self-conquest, of every cherished aspiration and endeavor. Here is every hour's patient instruction of these faithful teachers, every word of good counsel, every reproof, every admonition. Nothing has been lost. It is all here, if not in actual fruit, in blossom, or bud, or in life-bearing power. And the influence and success of these pupils as they shall go out from this school into the school of life, will be modified, if not actually determined, by the long succession of duties and privileges which this day terminates. The tree does not bend beneath its burden of luscious fruit as the result of a single day's sun-shine, but rather as the rich product of the continued and costly nurture of years of sun, and dew, and shower. Not a ray of sun-light has played over it, not a rain-drop or dew-drop has jeweled its leaves, not a breeze has swayed its branches, without contributing to the burden of glory which now crowns it. So in life. The successful performance of the simplest of to-day's duties may place under tribute a whole life time of preparation; and to-morrow's failure may date back to childish stumbles over the alphabet or to the early stiflings of conscience respecting what may have seemed to be trivial departures from the line of duty. Men do not gather grapes from thorns nor figs from thistles; nor is success in the emergencies of life the fruit of intellectual and moral emptiness. "If we expect our drafts to be honored in a crisis," says one, "there must have been the deposits of a punctual life."

The doctrine which I have presented, also teaches that the true value of school training is not measured by the amount of actual and available knowledge treasured up by the graduate—and this is true in business as well as professional life. A knowledge of the facts and principles related to each specific duty of life is very important, but higher than this is that developed strength and ability, that power of discernment and application, which can change the dead facts of knowledge into the living realities of human action and endeavor. Knowledge may guide and enlighten, but discipline gives strength of soul, self-poise, grasp, inspiration—and these, be it remembered, are the lucky winners of success in all the conflicts of life.

"You must ever bear in mind" says Carlyle in his recent address to the students of Edinburgh University, "that there lies behind that (particular and technical knowledge) the acquisition of what may be called wisdom—namely, sound appreciation and just decision as to all the objects that come round about you, and the habit of behaving with justice and wisdom."

Unquestionably the right application of the facts of knowledge in the conduct of life is the highest fruit of educational training. "The problem which comprehends every other problem," says Spencer, "is the right ruling of conduct in all directions under all circumstances." The ability, the soul-power, thus to rule one's conduct, which Carlyle calls wisdom,—a result it may be of knowledge, or rather of its acquisition—is as superior to the facts of knowledge as the workman is above his tools. "Wisdom," says Solomon, "is the principal thing: therefore get wisdom; and with all thy getting, get understanding."

Now wisdom is the enduring result of study and instruction. The facts of knowledge acquired at school may be forgotten, that is, they may fade from memory's conscious tablet, but they are absorbed, if I may so speak, by the mind, becoming in a sense a part of it. In ceasing to be conscious knowledge they may become wisdom. The apprehension of truth not only sheds a new light upon all truth, and especially all cognate truth, but it begets an increased power of discernment and multiplies the means of discerning. In other words a search after truth not only imparts to the mind increased strength and vigor, but the truth when

required creates a power of search in this direction, a quickness of apprehension, which may not inappropriately be called understanding.

The man who has devoted years to the study of law, has, as a result of such study, a new power of legal discernment, an acumen, a legal sense, if you please, which gives him increased wisdom in weighing legal questions,—and this may be true though he is not able to recall the verbal statement of a single fact or principle of law that he has ever read.

The facts of chemistry, geology, and natural philosophy, which the majority of these graduates will ever directly and consciously use, may be printed upon the fly-leaf of their textbooks in each of the sciences named, but it by no means follows that the time spent in the study of these sciences has been lost. The habit of scientific thought and investigation, the intellectual vision, the soul power secured through their mastery,—these remain as the practical fruit and power, the accumulated treasure of school life. Thus we see the wisdom of the remarkable saying of Malebranche, "If I held truth captive in my hand, I should open it and let it fly in order that I might again pursue and capture it." The true measure of study is soul-power.

But it is in the direction of moral influence that these principles have their fullest application. There can be no greater mistake than to suppose that influence and character can long be divorced. We might as well attempt to divide the stream from the fountain. The one is the complement or rather the necessary consequence of the other. When genuine character is wanting there will also be missed the irresistible charm and power of indwelling goodness and manliness.

Addison, in one of his allegories, describes a conflict for dominion between Truth and Falsehood. As Truth with her shining attendants entered the mythical regions of Falsehood, the dazzling light which emanated from her presence shone upon Falsehood, and the goddess faded insensibly until she seemed more like a huge phantom than substance, and as Truth approached still nearer, Falsehood with her retinue vanished and disappeared as the stars melt away in the brightness of the rising sun.

We have in this allegory a beautiful illustration of the source of that marvelous charm, that almost resistless influence, which flows, albeit unconsciously, from an exalted, noble character. Men do not become influential by the passage of a resolution. Back of the outward semblance there must be the indwelling substance. Our words must bear the stamp of the spirit. It has been truly said that "not the most eloquent exhortations to the erring and disobedient, though they be in the tongues of men and angels, can move mightily upon the resolutions of men, till the nameless, unconscious, but infallible presence of a consecrated heart lifts its holy light into our eyes, hallows our temper and breathes its pleading benedictions into our tones, and authenticates our entire bearing with its open seal." Let us remember that the source of our real influence in life is our genuine personal substance.—*Ohio Educational Monthly.*

A Recipe for Happiness.

The following is a good recipe for happiness. It is simple. When you rise in the morning form a resolution to make the day a happy one to a fellow-creature. It is easily done—a left-off garment to the man who needs it; a kind word to the sorrowful; an encouraging expression to the striving—trifles in themselves light as air—will do it, at least for the twenty-four hours; and if you are young, depend upon it, it will tell when you are old; and if you are old, rest assured it will send you gently and happily down the stream of time to eternity. Look at the result: You send one person—only one, happily, through the day; that is three hundred and sixty-five in the course of the year—and supposing you live forty years only, after you commence this course, you have made fourteen thousand six hundred human beings happy, at all events for a time. Now, worthy reader, is this not simple? and is it not

worth accomplishing? It is most excellent for digestion, and a producer of pleasant slumber. We hope that none will fail to try it.—*Herald of Health.*

How to Win a Child's Heart.

The heart of a child is easily won. It needs no besting, no formidable preparation for a grand assault, no advancing by regular approaches. You have only to go in the name of love, and demand a surrender, and without parleying, the prize is yours.

"Love begets love." Anger and hate beget anger and hate. Smiles are like musical voices amid the hills, which come back to those who utter them with their original sweetness. Did you ever smile on a child without receiving an answering smile? On the contrary, when you looked down coldly, perhaps with a frown, into the eyes of a child, have you not seen the reflection of your manner and expression in the mirror-like face of the little one?

Love children, and they will love you. Let children feel that you care for them—that you are interested in all that interests them, that you sympathize with them in all their little sorrows, and rejoice with them in all their little joys, and that you are their true and unselfish friend, and in those feelings you have the key to their hearts.

One word for you, dear teachers. You want to be loved by your scholars: then love your scholars. If you do love them it will not be necessary for you to say so, in order that they may be conscious of the fact. Children read hearts intuitively. They read your affection for them in every line of your face, in your moistened eye, in your unforced smile. They hear the declaration of it in every tone of your voice. They have the assurance of it in your manner—in your actions, which "speak louder than words."

Happy are we who have the love of the little ones under our care. It is a fountain of no common joy to our own heart, and it gives you an influence over them which can be obtained in no other way. Thus may you win those dear young hearts to Jesus. God help you to do it.—*S. S. Treasury.*

VACATION.

Welcome is vacation to all! And three welcome to the teacher! In the long weeks of the early summer he has been looking longingly forward to his release from the badly ventilated school-room and the peculiar anxieties of his calling. Now, divested of pedagogical restraint and dignity, he is free to enjoy the broad fields and the free pure air of the country. He is free to renew his youth in the careless ease and jolly good-humor of his home and early associations.

Vacation is a blessed compensation for work and worry, toil and care. In spite of years, it tends to make children of us. We may not turn somersaults on the green; or swing our hats in air, with merry shouts and loud huzzas; or roll, like young colts, in the soft meadow-grass; or leap the garden fence at a bound; or turn our jackets inside out; or jump out of our boots to paddle, barefoot, down the stream. Yet, nevertheless, we are sometimes children again. Vacation calls up this childhood within us, and transforms us, for the time, into lads and lasses.

We gladly rise from our time-worn seats, shake the professional dust from our garments, and seek the velvet meadow and the rugged mountain. We pluck the wild daisy, recline under the wide-spreading tree, listening to the rippling stream and the music of the birds. We watch the flocks upon the hill-side, and delight our vision in the brood that sails upon the stream. We pat Rower on the head, and extend a handful of fragrant clover to meek-eyed Brindle. To all these vacation lures us, "pilgrims weary with the march of life."

Verily, vacation is the teacher's honeymoon of life. It mollifies the temper that has been ruffled by the friction of school machinery. Friction is inevitable. For school boys and girls are no

exceptions to the general degeneracy of the race. Children are not born angels, and we often find perversity and deformity in place of wings. It is well for us to contemplate the freshness and beauty, the innocence and purity of childhood. It is pleasant to teach the "young idea how to shoot;" but when the twig has a constitutional tendency to twist in its growth and run into knots, it is not so easy to rear it to comely proportions. It is inspiring to teach where there is a desire to learn; but attempts to force knowledge through thickened skulls into empty craniums is hard and dogged work. To command the lively attention of those hungry for the crumbs of knowledge is pleasant employment; but when pupils prefer peanuts to geography and doughnuts to mathematics, teaching is not so very delectable after all. It is satisfactory to mark progress in wisdom, and to watch the unfolding of mind; but it is not particularly inspiring to discover that your pupil is more eager for a surreptitious bite at an apple, or a "dig" at the ribs of his companion, than for an honorable position at the head of his class. However, whatever may be the pros and cons of "school-keeping," vacation is a blessed "institution" for the teacher.

Nor is vacation less appreciated by the student. What boarding-school miss, or what collegian—be he verdant freshman, wise sophomore, conservative junior, or reverend senior—but has impatiently counted over and over again the days which preceded vacation. His vacation brings with it the gentle embraces of his mother, more esteemed by him than medals of gold or wreaths of laurel, with all his "college honors." May this vacation indeed be a happy one for us all; and may we all take in a good stock of new life and strength, to conduct successfully our next campaign against ignorance. May none have occasion to say that the realization of the pleasures of vacation is less than the anticipation.—*Abridged from the Educational Monthly.*

Denominate Numbers.

The following, or some similar analysis of denominate numbers may be produced, under the guidance of the teacher, by any class of intelligent pupils.

After the classifications, denominations, and tables, the pupil should be made familiar with descending and ascending reduction, so as to describe and analyse the processes readily. He should also observe, that the reductions of denominate, vulgar, and decimal fractions, are merely the applications of reduction to fractions.

In changing denominate numbers to vulgar fractions, besides reducing the quantities, the pupil must be taught to compare them. To teach the process of comparing quantities, such exercises as the following will be found useful. Compare 12 with 20, in which the pupils must observe that 12 is $\frac{3}{5}$ of 20, or 20 is $\frac{5}{3}$ of 12. In changing denominate numbers to decimals of a higher denomination, the pupil should see that there is involved, first, the expression of each denomination as the fraction of the next higher, second, the changing of this vulgar fraction to a decimal.

Changing fractions to denominate whole numbers, involves descending reduction, with the additional process of changing improper fractions to whole or mixed numbers.

In the combinations, the elements of addition are simple addition and reduction ascending. Subtraction involves simple subtraction where the scales differ. Multiplication is simple multiplication, ascending reduction, and simple addition. Division is simple division, descending reduction and simple addition. All the combinations require more or less of the reduction of fractions.

It should be kept in mind, that the more operations we can refer to one principle, the less the memory is burdened and the more comprehensive is the knowledge. The aim of the teacher should be: first, to let the pupil observe all the facts and operations; second, to let him arrange, classify and refer these facts and operations to principles already known. Knowledge newly acquired should be interwoven with what is already known—

should be seen to grow out of principles and facts with which the pupil is already familiar.

DENOMINATE NUMBERS	1	Classification	According to	1. Form		
				1. Simple	2. Compound	
				2. Use		
				1. Currencies	<ul style="list-style-type: none"> 1. Federal Money 2. Sterling Money, etc 	
				2. Weights.	<ul style="list-style-type: none"> 1. Troy 2. Avoirdupois 3. Apothecary 	
				3. Measures	<ul style="list-style-type: none"> 1. Of length—Long—Cloth 2. Of Surface—Square 3. Of Volume—Solid 4. Of Capacity <ul style="list-style-type: none"> 1. Wine 2. Beer 3. Dry 5. Time Measure 6. Angular Measure 	
	2.	Operations	1	Reductions		
				1. Descending	<ul style="list-style-type: none"> 1. Of Entire Quantities 2. Of Fractions 	<ul style="list-style-type: none"> 1. Vulgar 2. Decimal
				2. Ascending	<ul style="list-style-type: none"> 1. Of Entire Quantities 2. Of Fractions 	<ul style="list-style-type: none"> 1. Vulgar 2. Decimal
				3. To change Denominate Numbers to Fractions	<ul style="list-style-type: none"> 1. Vulgar 2. Decimal 	<ul style="list-style-type: none"> 1. Vulgar 2. Decimal
				4. To change	<ul style="list-style-type: none"> 1. Vulgar 2. Decimal 	Fractions to Denominate Numbers
				5. To change Quantities from one Current Weight or Measure to another		
	2.	Combinations	1. Addition		<ul style="list-style-type: none"> 1. Of Entire Quantities 2. Of Fractions 	
			2. Subtraction	<ul style="list-style-type: none"> 1. Of Entire Quantities 2. Of Fractions 		
			3. Multiplication	<ul style="list-style-type: none"> 1. Of Entire Quantities 2. Of Fractions 		
			7. Division.			

New York Teacher.

SCIENCE.

Description of an Ancient Sepulchral Mound near Newark, Ohio.

By O. C. MARSH, F.G.S.

In the first volume of the Smithsonian Contributions Messrs. Squier and Davis have ably described the most important of those ancient monuments of the Mississippi Valley, which render that region so interesting to the student of American archæology. By discarding vague speculation, which had been the prominent fault of most previous investigators, and adopting that rigid method of research inaugurated so successfully by Scandinavian antiquaries, these authors were enabled to embody in their work all that was valuable in previous accounts, and to add much new and important information concerning that ancient population of this country, who have left behind them so many imposing structures. The subsequent researches of Squier, Latham, and others, have thrown additional light upon this interesting subject, so that at the present time the "Mound-builders" can no longer be regarded as an unknown people, although both tradition and history are silent in regard to them.

Few of these ancient monuments of the West have attracted more attention than the group of 'Enclosures,' or 'Forts,' near Newark, Ohio, which have long been celebrated on account of their great extent, and remarkable regularity. They consist mainly of elaborate earthworks, in the form of a circle, octagon, and square, and enclose an area of about four square miles, on the upper terrace between two branches of the Licking River. They were well described by Atwater, in 1820, who regarded them as works of defense; and subsequently by Squier and Davis, who, however, considered them sacred enclosures. Scattered over the same plain, and crowning the neighboring hills, are numerous tumuli, or mounds, evidently erected by the same people that built the larger works.

While on a geological excursion through the West, during the last autumn, the writer spent several days at Newark, examining these various monuments in company with George P. Russell, Esq., of

Salem, Mass., who is well versed in everything relating to American antiquities. In the course of our investigations a sepulchral mound was opened, which proved to be in many respects the most interesting one of the kind yet examined. Mounds of this class received from Squier and Davis much less attention than the smaller "Alter Mounds," as the latter usually contain more relics of ancient art. These authors, moreover, examined none of those belonging to the Newark group of works, although the mounds in that vicinity appear to present some points of difference from those of other localities. For these reasons a more detailed account of our explorations will be given than would otherwise be necessary. The mound selected for examination was about two and a half miles south of Newark, on the farm of Mr. Thomas Taylor, and was known in the neighborhood as the "Traylor Mound." It was conical in form, about ten feet in height, and eighty in diameter at the base, these being about the average dimensions of the burial mounds in that vicinity. It was situated on the summit of a ridge, in the midst of a stately forest. On the mound itself several oak trees, two and a half to three feet in diameter, were growing, and near them were stumps of others, evidently of greater age. The mound stood quite alone, nearly half a mile from its nearest neighbor, and about three miles from the large earthworks already mentioned. In our explorations we were greatly assisted by Dr. J. N. Wilson, and Messrs. Dennis and Shrock, of Newark, and Charles W. Chandler, Esq., of Zanesville, who are all much interested in the local antiquities of that region.

An excavation about eight feet in diameter was first made from the apex of the mound, and after the surface soil was removed the earth was found to be remarkably compact, probably owing to its having been firmly trodden down when deposited. This earth was a light loam, quite different from the soil of the ridge itself, and its peculiar mottled appearance indicated that it had been brought to the spot in small quantities. In excavating the first five feet, which was a slow and very laborious undertaking, nothing worthy of notice was observed except some traces of ashes, and pieces of charcoal and flint, scattered about at various depths. At five and a half feet below the surface, where the earth became less difficult to remove, a broken stone pipe was found, which had evidently been long in use. It was made of a very soft limestone containing fragments of small fossil shells, apparently Cretaceous species. No rock of precisely this kind is known to exist in Ohio. Pieces of a tube of the same material, and about an inch in diameter, were found near the pipe. The cavity was about two-thirds of an inch in diameter, and had been bored out with great regularity. Similar tubes have occasionally been found in mounds, but their use is not definitely known.

About seven feet from the top of the mound a thin white layer was observed, which extended over a horizontal surface of several square yards. Near the center of this space, and directly under the apex of the mound, a string of more than one hundred beads of native copper was found, and with it a few small bones of a child, about three years of age. The beads were strung on a twisted cord of coarse vegetable fibre, apparently the inner bark of a tree, and this had been preserved by salting of the copper, the antiseptic properties of which are well known. The position of the beads showed clearly that they had been wound two or three times around the neck of the child; and the bones themselves, (the neural arches of the cervical vertebrae, a clavicle, and a first rib), were precisely those which the beads would naturally come in contact with, when decomposition of the body ensued. The remains evidently owe their preservation to this fact, as they are all colored with carbonate of copper, and the other parts of the skeleton had entirely decayed. The position the body had occupied, however, was still clearly indicated by the darker color of the earth. The beads were about one-fourth of an inch long, and one-third in diameter, and no little skill had been displayed in their construction. They were evidently made, without the aid of fire, by hammering the metal in its original state; but the joints were so neatly fitted that in most cases it was very difficult to detect them. On the same cord, and arranged at regular intervals, were five shell beads, of the same diameter, but about twice as long as those of copper. All had apparently been well polished, and the necklace, when worn, must have formed a tasteful and striking ornament. (1)

About a foot below the remains just described, and a little east of the center of the mound, were two adult human skeletons, lying one

above the other, and remarkably well preserved. The interment had evidently been performed with great care. The heads were toward the east, slightly higher than the feet, and the arms were carefully composed at the sides. A white stratum, similar in every respect to the one already mentioned, was here very distinct, and extended horizontally over a space of five or six yards, in the center of which the remains had been laid. The earth separated readily through this stratum, and an examination of the exposed surfaces showed that they were formed from two decayed layers of bark, on one of which the bodies had been placed, and the other covered over them. The smooth sides of the bark had thus come together, and the decomposition of the inner layers had produced the peculiar white substance, as a subsequent microscopic examination clearly indicated. (2) Directly above these skeletons was a layer of reddish earth, apparently a mixture of ashes and burned clay, which covered a surface of about a square yard. Near the middle of this space was a small pile of charred human bones, the remains of a skeleton which had been burned immediately over those just described. The fire had evidently been continued for some time, and then allowed to go out; when the fragments of bone and cinders that remained were scraped together, and covered with earth. All the bones were in small pieces, and most of them distorted by heat; but among them were found the lower extremity of a humerus, and some fragments of a fibula, which showed them to be human, and indicated an adult rather below the medium size. The two skeletons found beneath these remains were well formed, and of opposite sex. The ossification of the bones indicated that the female was about thirty years of age, and the male somewhat older. It is not impossible that these were husband and wife—the latter put to death and buried above the remains of her consort; and the charred bones may have been those of a human sacrifice, slain at the funeral ceremonies. (3) Near these skeletons was a small quantity of reddish brown powder, which proved on examination to be hematite. It was probably used as a paint. (4)

On continuing our excavations about a foot lower, and somewhat more to the eastward, a second pile of charred human bones was found resting on a layer of ashes, charcoal and burned clay. But one or two fragments of these remains could be identified as human, and these also indicated a small-sized adult. The incineration had apparently been performed in the same manner as in the previous instance. Immediately beneath the clay deposit a third white layer was observed, quite similar to that just described. In this layer was a male skeleton, not in so good a state of preservation as those already mentioned, although evidently belonging to an individual considerably older. In this case also the head was toward the east, and the burial had been carefully performed. Near this skeleton about a pint of white chaff was found, which appeared to belong to some of the native grasses. The form was still quite distinct, although nearly all the organic substance had disappeared. A few inches deeper, near the surface of the natural earth, several skeletons of various ages were met with, which had evidently been buried in a hurried manner. All were nearly or quite horizontal, but no layer of bark had been spread for their reception, and no care taken in regard to arrangement of limbs. These skeletons were in a tolerable state of preservation, some parts being quite perfect. A tibia and fibula, with most of the corresponding bones of a foot, were found quite by themselves, and well preserved.

Our excavations had now reached the original surface of the ridge, on which the mound was erected, and we were about to discontinue further researches, when the dark color of the earth at one point attracted attention, and an examination soon showed that a cist, or grave, had first been excavated in the soil, before the mound itself was commenced. This grave was under the eastern part of the elevation, about four feet from the center. It consisted of a simple excavation, in an east and west direction, about six feet long, three wide, and nearly two deep. In this grave were found parts of at least eight

(2) This white layer, which was thought by Squier and Davis to be the remains of matting, is a characteristic feature in burial mounds. It has only been found where the interments were unquestionably those of mound builders.

(3) Among the ancient Mexicans and Peruvians, when a ruler or other person of high rank died, his wives and domestics were often put to death at the tomb, and in some instances the remains were burned.

(4) A larger quantity of the same substance was found in another mound near Newark. May not the "iron rust" discovered in the mound at Marietta, and regarded by some as proof that the mound-builders were acquainted with that metal, have been merely this substance? Implements of hematite were, indeed, found in the same mound.—*Transactions American Antiquarian Soc.*, vol. i, p. 168.

(1) Native copper seems to have been the favorite material for ornaments among the mound-builders. The metal was, without doubt, derived originally from the Lake Superior deposits, although it may have been found in the drift. It was more probably taken directly from the deposits themselves, as they exhibit abundant evidence of ancient mining operations, which no one familiar with such matters would attribute to the more recent Indians.

skeletons, which had evidently been thrown in carelessly,—most of them soon after death, but one or two not until the bones had become detached and weathered. Some of the bones were very well preserved, and indicated individuals of various ages. Two infants, about a year and eighteen months old respectively, were each represented by a single os ilium, and bones of several other small children were found. One skull, apparently that of a boy about twelve years of age, was recovered in fragments, and this was the best preserved of any obtained in the mound. The skeleton of an aged woman of small stature was found resting on its side. It was bent together, and lay across the grave with its head towards the north. Some of the loose, human bones, exhumed from the bottom of the grave, were evidently imperfect when thrown in. Among these was part of a large femur, which had been gnawed by some carnivorous animal. The marks of the teeth were sharply defined, and corresponded to those made by a dog or a wolf.

Quite a number of implements of various kinds were found with the human remains in this grave. Near its eastern end, where the detached bones had been buried, were nine lance and arrow-heads, nearly all of the same form, and somewhat rudely made of flint and chert. The material was probably obtained from "Flint ridge," a siliceous deposit of Carboniferous age, which crops out a few miles distant. These weapons are of peculiar interest, as it appears they are the first that have been discovered in a sepulchral mound, although many such have been carefully examined. They show that the custom—so common among the Indians of this country—of burying with the dead their implements of war or the chase, obtained occasionally, at least, among the mound-builders. Not far from these weapons six small hand-axes were found, one of which was made of hematite, and the rest of compact greenstone, or diorite, the material often used by the Indians for similar articles. Two of these corresponded closely in form with the stone hand-axe figured by Squier and Davis as the only one then known from the mounds. With these axes were found a small hatchet of hematite, a flint chisel, and a peculiar flint instrument, apparently used for scraping wood.

In the central part of the grave, near the aged female skeleton already alluded to, were a large number of bone implements, all exceedingly well preserved. Among these were five needles, or bodkins, from three to six inches in length, neatly made from the metatarsal bones of the common deer; and also a spatula, cut from an ulna, and probably used for moulding pottery. With these were found about a dozen peculiar implements formed from the antlers of the deer and elk. They are cylindrical in form, from three to eight inches in length, and an inch to an inch and a half in diameter. Most of these had both ends somewhat rounded, and perfectly smooth, as if they had either been long in use, or carefully polished. It is possible these implements were used for smoothing down the seams of skins or leather: they would, at least, be well adapted to such a purpose. A "whistle," made from a tooth of a young black bear, and several spoons, cut out of the shells of river mussels, were also obtained, near the same spot.

A vessel of coarse pottery was found near the western end of the grave, but, unfortunately, was broken in removing it. It was about five inches in its greatest diameter, six in height, and one-third of an inch in thickness. It was without ornament and rudely made of clay containing some sand and powdered quartz. It was filled with soft, black earth, the color being probably due to some animal or vegetable substance, which it contained when deposited in the grave. Fragments of a vase of similar material, but having the top ornamented, were found in another part of the mound. Neither of these vessels were superior, in any respect, to the pottery manufactured by the Indians.

Near the bottom of the mound, and especially in the grave, were various animal bones, most of them in an excellent state of preservation. Many of these belonged to the common deer, and nearly all the hollow bones had been skilfully split open lengthwise,—probably for the purpose of extracting the marrow,—a common custom among rude nations. Some of these remains of the deer indicated individuals of a size seldom attained by the species at the present time. Beside one of the skeletons in the grave, and evidently deposited with it, were several bones of the gray rabbit. This renders it not unlikely that the mound-builders used this animal for food,—a point of some interest, as the inhabitants of Europe in the stone age are supposed to have been prevented from eating the hare, by the same superstition that prevailed among the ancient Britons, and is still observed among the Laplanders.

Some of the animal remains in the mound, although well preserved, were in too small fragments to admit of accurate determination. Characteristic specimens, however, were obtained of those in the following list:

Cervus Canadensis, Erlx., (elk).

Cervus Virginianus, Bodd., (common deer).

Ursus Americanus, Pallas, (black bear).

Canis Latrans? Say, (prairie wolf).

Lepus sylvaticus, Bach., (gray rabbit).

Arctomys monax, Gm., (woodchuck).

Unio ulatus, Say, (river mussel).

It will be observed that these are all existing species, and, with one or two exceptions, are still living in Ohio—a fact of some importance in its relation to the antiquity of the mounds. The discovery of these remains under such circumstances shows, moreover, that the mound-builders depended, to some extent, at least, on the chase for subsistence. If, however, they were a stationary and agricultural people, as is generally supposed, we should expect to find in the mounds, the remains of domestic, rather than of wild, animals, but none of these have yet been discovered. This may be owing to the fact that comparatively little attention has hitherto been paid to the animal remains, and other objects of natural history found in the mounds, although a careful study of these would undoubtedly throw much light upon the mode of life of the mound-builders. (1)

The excellent state of preservation of the various skeletons in this mound is remarkable, and has probably never been equalled in the hundreds that have hitherto been examined. The remains of undoubted mound-builders have almost invariably been found so much decayed that it was impossible to recover a single bone entire. (2) The preservation in this case was doubtless due in part to the excessive compactness of the earth above the remains, but mainly to the fact that the mound stood on an elevation, where moisture could not accumulate. The skeletons in the lower part of the mound were not so well preserved as those higher up, probably because the original soil of the ridge naturally retained more moisture than the earth above it. There may have been, moreover, a considerable interval between the irregular burials, and those that followed, and thus some of the skeletons commenced to decay before the mound was completed. The interval, however, could not have been of very long duration, as no perceptible deposit of vegetable matter was formed over the small mound then existing. The same may be said of the intervals between the regular interments, and also of the subsequent period preceding the final completion of the mound. It should, perhaps, be remarked before proceeding further, that this mound had evidently never been disturbed by the Indians, and that all the human remains and other objects found in it were undoubtedly deposited there by its builders. This will readily be admitted by every one familiar with the subject, as the last interment was at least seven feet below the surface, directly under the apex of the mound, and the white layers—infallible indications of regular burials of the mound-builders—all extended over the grave, and remained undisturbed. (3)

The skeletons found in this mound were of medium size, somewhat smaller than the average of those of the Indians still living in this country. The bones were certainly not stouter than those of Indians of the same size, although this has been regarded as a characteristic of the remains of the mound-builders. All the skulls in the mound were broken—in one instance apparently before burial—and most of them so much decayed that no attempt was made to preserve them. Two, however, were recovered with the more important parts but little injured. Both were of small size, and showed the vertical occiput, prominent vertex, and large interparietal diameter, so characteristic of crania belonging to the American race. In other respects there was nothing of special interest in their conformation. With a single exception, all the human teeth observed were perfectly sound. The teeth of all the adult skeletons were much worn, those of aged individuals usually to a remarkable degree. The manner in which these were worn away is peculiarly interesting, as it indicates that the mound-builders, like the ancient Egyptians, and the Danes of the stone age, did not, in eating, use the incisive teeth for cutting, as modern nations do. This is evident from the fact that the worn

(1) The animal remains found near the Swiss lake habitations, show conclusively that the earliest inhabitants of those settlements were hunters, who subsisted chiefly on wild animals: at a later period, however, during the change to a pastoral state, domestic animals were gradually substituted as an article of food.—*Huimeyer, Fauna acr Pfahlbauten der Schweiz*. Basel, 1861.

(2) Squier and Davis regard this fact as evidence of the great antiquity of the mounds, as in England, where the moist climate is much less favorable for preserving such remains, perfect skeletons of the ancient Britons have been found, although known to have been buried at least 1500 years.—*Smithsonian Contributions*, vol. i, p. 168.

(3) It is well known that the modern Indians occasionally buried their dead in the mounds, but invariably near the surface; the position of such remains, and especially the manner of their interment clearly distinguish them from the original deposits of the mound-builders.

incisors are all truncated in the same plane with the coronal surfaces of the molars, showing that the upper front teeth impinge directly on the summits of those below, instead of lapping over them. This peculiarity may be seen in the teeth of Egyptian mummies, as was first pointed out by Cuvier.

All the bones in this mound, animal as well as human, were very light, and many of them exceedingly brittle. They adhere strongly to the tongue, but application of hydrochloric acid shows that they still retain a considerable portion of the cartilage. Some of the more fragile bones, which showed a tendency to crumble on exposure to the air, were readily preserved by immersing them in spermaceti melted in boiling water, a new method, used by Prof. Lartet and other French paleontologists, and admirably adapted to such a purpose.

There are several points connected with this mound which deserve especial notice, as they appear to throw some additional light upon the customs of the mound-builders, particularly their modes of burial, and funeral ceremonies. One of the most remarkable features in the mound was the large number of skeletons it contained. With one or two exceptions, none of the burial mounds hitherto examined have contained more than a single skeleton which unquestionably belonged to the mound-builders, while in this instance parts of at least seventeen were exhumed. The number of small children represented among these remains is also worthy of notice, as it indicates for this particular case a rate of infant mortality (about thirty-three per cent) which is much higher than some have supposed ever existed among rude nations. Another point of special interest in this mound is the evidence it affords that the regular method of burial among the mound-builders was sometimes omitted, and the remains interred in a hurried and careless manner. This was the case with eleven skeletons exhumed in the course of our explorations, a remarkable fact, which appears to be without a precedent in the experience of previous investigators. It should be mentioned in this connection that nearly all of these remains were those of women and children. Their hurried and careless burial might seem to indicate a want of respect on the part of their surviving friends, were there not ample evidence to prove that reverence for the dead was a prominent characteristic of the mound-builders. It is not unlikely that in this instance some unusual cause, such as pestilence or war, may have made a hasty interment necessary. The various implements and remains of animals found with these skeletons also deserve notice, as they far exceed in number and variety any hitherto discovered in a single mound. They prove, moreover, that, if in this instance the rites of regular burial were denied the departed, their supposed future wants were amply provided for. The contents of one part of the cist (which is itself a very unusual accompaniment of a mound) appears to indicate that the remains of those who died at a distance from home were collected for burial, sometimes long after death. The interesting discovery of weapons, which were found with these detached bones, would seem to imply that in this case the remains and weapons of a hunter or warrior of distinction, recovered after long exposure, had been buried together. (4)

The last three interments in this mound were performed with great care, as already stated, and in strict accordance with the usual custom of the mound-builders. The only point of particular interest in regard to them is the connection which appears to exist between some of the skeletons and the charred human bones found above them. Similar deposits of partially burned bones, supposed to be human, have in one or two instances been observed at the altars of sacrificial mounds, and occasionally in mounds devoted to sepulture, but their connection with the human remains buried in the latter, indeed any existed, appears to have been overlooked. Our explorations, which were very carefully and systematically conducted, clearly demonstrated that in these instances the incineration had taken place directly over the tomb, and evidently before the regular interment was completed: taking these facts in connection with what the researches of other investigators have made known concerning the superstitious rites of this mysterious people, it seems natural to conclude that in each of these cases a human victim was sacrificed as part of the funeral ceremonies, doubtless as a special tribute of respect to a person of distinction.

All the skeletons in this mound, except one, appeared to have been buried in a horizontal position with the face upwards. The exception was the skeleton of the aged female found in the grave, which lay on its side; but this may have been owing to the fact that the body had been bent together, perhaps in consequence of age. The skeletons which had received a regular interment all had their heads toward the east, but no such definite position has been noticed in the remains

found in other mounds. As the grave had the same direction, this can hardly have been unintentional, although it may have been determined by the position of the ridge upon which the mound stood. The layer of charcoal, not unfrequently found in sepulchral mounds, was wanting in this instance, as was also the evidence, usually afforded by the same substance, that the fire, which consumed the human remains, had been suddenly extinguished by a covering of earth. Possibly the former, as well as other objects of interest, were contained in the outer portion of the mound, which was not examined, although usually everything deposited by the mound-builders was placed near the center; and hence our explorations were chiefly confined to that part.

Such is a brief and incomplete description of one of the ancient mounds of the West, of which at least ten thousand are known to exist in the single state of Ohio, and countless numbers elsewhere in the valleys of the Mississippi and its tributaries. These structures are the only remaining memorials of a race whose history has been buried with them, and from these alone can we hope to learn who this people were, and whence they came. The Indians of this country, although retaining no tradition of this more ancient population, regarded their works with great veneration; but the present possessors of the soil have, in general, little of this feeling, and hence hundreds of these monuments of the past are annually swept away by the plow, and their contents irretrievably lost. A few pioneers in American archaeology have, indeed, rescued much that is valuable, but the work is hardly commenced; and a careful and systematic investigation of these various monuments would not only add greatly to our knowledge of this interesting people, but doubtless also help to solve the question of the antiquity of man on this continent, and, perhaps, that more important one of the unity of the human race.

New Haven, Ct., Feb. 1866.

American Journal of Science.

On the Velocity of Nervous Impressions.

BY W. F. BARRETT.

Amidst all the marvels of this wonderful body of ours, there is nothing more interesting, and yet nothing of which we know so little, as those slender white strings and the clustering grey cells associated with them, which together we call the nerves. There was a time when it was considered blasphemous to investigate any vital phenomena; and, although science has done so much to clear away the thralldom of superstition, still in the present day there are not a few who regard an attempt to search out the higher phenomena of life with feelings similar to those who, in former days, feared to know how we move our limbs or digest our food. But surely no thoughtful man can think it an impious endeavour to understand the obscurer parts of the Creator's highest work. Concerning our mind, can any one think it wrong to change ignorance, "the region of disorderly mystery," into science, the "realm of orderly mystery"?—for science does not remove the mysteries which surround us; all she can do is to classify them, and thus lead us to see that true mysteriousness of nature which she is impotent to explain.

The enigma of the nerve cells has as yet been unsolved by science. But it is not so with the nerve fibres, for their function has been ascertained beyond a doubt. They are discovered to be the transmitters merely of that unknown and still greater mystery we name the nerve force, or nervous agent—a power which, acting upon the nerve cells stored up in the brain, there awakens, or is translated into consciousness. How, it is probable we can never know, for this would be a comprehension of an organ by itself; a thing as difficult to conceive of as it would be to suppose the heart alone capable of knowing how it contracts, or the stomach understanding how its functions are discharged. The superior alone can comprehend the inferior.

It is, however, a great step to know something about the nerve fibres, for they are our only means of communication with the outer world, and through them we can by gross means stir a power into action which in its turn can arouse sensation, the highest achievement of the action of force upon matter. The structure of these nerve fibres has long been known, and corresponds with the function assigned to them. They are like submarine telegraph wires, as has often but not the less truly been said, and as such have a central core, what appears an insulating coating, and then a protecting sheath.

But if this nervous power, which we can excite with the prick of a pin, really passes from the excited part to the brain, it must take time in its transit. The velocity of electricity and of light has been measured; can the rate of propagation of this nerve force be determined? It can, and Helmholtz, the illustrious professor of physiology in Heidelberg, has made this determination with great accuracy.

(4) A similar custom still prevails among some tribes of western Indians.

Though it is some time since this was accomplished, yet an admirable exposition of the whole subject has recently been given at a Friday evening meeting of the Royal Institution, by Dr. Emil du Bois Reymond, the eminent professor of physiology in the University of Berlin. A brief notice of this lecture will, we think, be acceptable to many of the readers of the *Intellectual Observer*.

First of all, we must be convinced that there really is something travelling along the nerve. It is not necessary to suppose the passage of an entity, or "imponderable," as our fathers used to say, but as modern science would teach us, we have to conceive merely of a pulse, a transmission of motion through the nerve.

By a most ingenious arrangement, Professor du Bois Reymond illustrated by experiment the way in which he considers such a pulse to be transmitted through the nerves. A number of double magnetic needles were suspended in a long row within a glass case, so that the ends of each needle were in a line with, and close to, but not touching the needle in front. Pushing the pole of the terminal needle obliquely aside, the attraction which it exercised in its new position displaced the next adjacent needle in a contrary direction. This displaced the next, and that in its turn the next, and thus a zigzag motion ran along the row of needles to the far end, where the movement of the terminal one rang an electric bell. The propagation of nerve force is analogous to this, for, as will be seen directly, it is a slow motion, not almost instantaneously transmitted like light or electricity. To show the actual transmission of the nervous agent, the professor took a frog—and frogs are most indispensable creatures in these experiments, we believe Dr. du Bois Reymond brought over as many as 200 to illustrate his lectures at the Royal Institution—and from the hind legs of this frog dissected a muscle with its attached nerve. Stimulating the free end of the nerve by a feeble electric current, the muscle announces the reception of this stimulus by a violent contraction, rendered visible to the audience by the lifting of a coloured disc. The nerve was now tied in the middle and again stimulated; this time no contraction of the muscle occurred, the ligature had prevented the passage of the nervous agent. Thus a material change does really pass along a nerve when it is stimulated. This change, whatever its real nature we know not, is certainly quite distinct from electricity, for that force would not have been hindered in its transit by the mere tying of the conducting nerve.

The next problem to be solved is how to determine the rate at which this change proceeds along the nerves. Only fifteen years ago, the solution of this was thought by eminent men to be impossible on account of experimental difficulties, but, as already stated, this has been done in the first instance by Helmholtz, who used a method suggested by M. Pouillet for measuring the velocity of projectiles.

When a current of very short duration is passed through a galvanometer, the deflection is proportionate to this duration, and hence the time taken by any transient phenomenon may be ascertained, provided its beginning and its end can be made to coincide exactly with the beginning and end of an electric current. This coincidence in time M. Pouillet accomplished by a most ingenious device which is in actual use in gunnery experiments. The way in which this method has been applied to the problem now under consideration, was shown by Professor du Bois Reymond, and illustrated by an experiment. Thus it was seen, by the comparative amplitude of the deflection of a galvanometer needle, the comparative duration of the passage of the nervous agent in two cases.

There is, however, besides this, another method by which the same object can be obtained much more easily. This may be termed the graphical method; and it consists in causing the muscle to be the penman, by making it write the moment of its contraction on a revolving cylinder. The contraction follows at a short but definite interval after it has received the stimulus transmitted through the nerve, and in contracting it draws a curve indicative of the beginning of the contraction, as well as of its subsequent stages. Now, if after having drawn one such curve the cylinder be turned, so as to bring it back to its starting-point and the nerve be stimulated a second time at precisely the same place, a second curve will be drawn coinciding exactly with the first. If, however, one curve be drawn by stimulating the nerve at a point A distant from the muscle, and another by stimulating a portion B nearer the muscle, the resulting curves will not now overlap, but a displacement will be observed corresponding to the time required by the nerve force to travel from A to B. This important result was first arrived at by Helmholtz, by means of a beautiful but complicated apparatus termed the *Myographion*. In his lecture, Professor du Bois Reymond succeeded in drawing the actual curves, but instead of the rotating cylinder using a glass-plate sliding along guides and propelled by a spring. The two curves thus drawn were rendered visible to the audience by projecting their image on the screen by means of the electric light. The difference in the commencement of the contraction in the two cases was very clearly seen; in

fact, although obtained in the lecture—when, as a rule, experiments are less successful than beforehand—the curves were as distinct and almost as perfect as if they had been selected from careful laboratory experiments.

What, then, is the result of the investigations of Helmholtz on the velocity of the nerve force? It is one which, at first sight, is most astonishing; for the rate of propagation, compared with other forces, is extremely slow. The velocity of light is about 190,000 miles a second, and of electricity even more; but the velocity of the nerve force is only ninety feet a second, one twentieth of the velocity of a cannon-ball, about one-thirteenth of the velocity of sound in air, and not exceeding, but about equal to, the speed of an express train. The rate at which impressions are transmitted through the nerves is more fully compared with the velocity of other forces in the following table, the measurements throughout being in metres (3.28 feet equal 1 metre) as the most convenient standard:—

	Metres in one second.
Electricity	161,000,000
Light	300,000,000
Sound through iron.....	3,485
“ “ water.....	1,435
“ “ air.....	332
Cannon ball.....	552
Eagle's flight.....	35
Nerve force.....	28
Greyhound or racehorse.....	25
The arm in throwing a stone.....	22
Gale of wind.....	20
Arterial wave.....	9
Muscular contraction.....	1

The velocity of nervous transmission in our bodies has also been examined, by inserting fine wires in the finger and toe of a living man; through these wires the nerves could be stimulated by an electric current, and the rate of propagation measured by very delicate means. No sensible difference was found between the velocity in the nerves of a man, and in these of a frog. Therefore, as the Professor remarked, when the driver of an express train points to the tender, and wills to move his fingers, whilst performing the act the nerve force in the nerves of his arm remains stationary in space, or nearly so, because the velocity of the train in one direction destroys that of the nervous agent in the other. In a creature so long as the whale, the rate of nervous transmission becomes very perceptible when the extremities have to be moved. The fact of a harpoon having been thrown in the tail of a good-sized whale would not be announced in the brain of this creature till a second after it had entered; and as it would take a little more than another second before the command to move its tail would reach the appropriate muscles, a boat's crew might be far away before the animal they had pierced began to lash the sea. Similar considerations would lead us to see that we could not move our fingers and legs, for example, beyond a certain rate; for were this rate to equal the time occupied by the transmission of nerve force from the part moved to the nerve centre, the successive stimuli sent along the motor nerves would link themselves into one, and the muscle would remain permanently contracted.

A very interesting fact connected with nervous transmission was mentioned by Dr. du Bois Reymond. This was the effect of temperature on the velocity of the nerve force. When the nerve was warm, the curves drawn on glass as we have described, were close together. Ice-cold water was then caused to flow over the nerve; when two new curves were drawn, they were widely separated from each other, showing that in the latter case the nervous force had travelled at a slower rate than in the former.

One other point remains to be noticed. Besides the time required for the transmission of a stimulus through the nerves, the mind takes a certain period to form a conception, and then to prompt the limbs to act accordingly. This time, measured by a similar method, has been found to be about one tenth of a second. Some strange results have been deduced from this fact. The passage of a rifle-bullet through the brain would not occupy more than the thousandth of a second; a stroke of lightning would pass through the body in inconceivably less time; and thus a person killed by either of these means would die without consciousness having time to be produced. The placid aspect of those who have thus died, and the testimony of those who have recovered from a lightning stroke, go to prove that no pain was felt prior to the insensibility which followed the act.

The delicate and complex nature of the experiments by which all these results have been obtained has probably never been surpassed. The most refined and sensitive instruments are needed to carry them into execution, and all who looked on Professor du Bois Reymond's

apparatus must have been at once bewildered and charmed. The thanks of the English public, and especially of the medical schools, are due to the patient toil of the professor, who succeeded in transferring his fragile instruments from Berlin to London, and, after hours of laborious preparation, has given, not only the demonstration of the Friday evening we have noticed, but three other experimental lectures at the Royal Institution, and one at the College of Physicians.—*Intellectual Observer.*

Are there Other Inhabited Worlds ?

(Concluded from our last.)

Besides all these obstacles others must be specified. A telescope of very large size is necessary in order that photographs may be procured with rapidity, and such an instrument is difficult to obtain. It must be either bought or made by the observer. In the latter case the time consumed in perfecting the lenses or mirrors is very great. I spent six years on my instrument, but had then the satisfaction of knowing that it was thoroughly adapted to its purpose. It has a mirror 15½ inches in diameter, and a tube 12½ feet long, and is mounted at Hastings on Hudson, 20 miles north of this city. The reason that so large an instrument is demanded—for this is the largest reflector in use in America—is, that a great amount of light must be collected to get a photograph of such a size that it will bear magnifying, and yet can be taken quickly. The problem is just the same as in portrait photography—the larger the lens the more quickly can a picture of a given size be taken. It was ignorance of this fact that led Daguerre, who invented the daguerrotype process, to declare that human portraits could not be taken photographically. According to his ideas, and with his apparatus, it was necessary to sit more than two hours, and that requires more patience or stolidity than most of us have. My father, however, overturned this idea, and in 1839 succeeded in the University of this city in getting the first portrait from life. One of the earliest is still in existence in the possession of Sir John Herschel, who states that it is as good as when first made.

In the enlarged photographic view which you are going to see upon the screen there are many points to which your attention might be directed. Of these we shall select only a few, as a full explanation of all would demand too much time. (2)

You will perceive, in the first place, that the whole circular face of the Moon is not presented to you; only one semicircle is visible. The photograph is taken from the Moon in her third quarter, when she was 21 days old, because at that time it better exhibits the more striking peculiarities than when full. You will remark that the semicircle is diversified with light and shadow: some parts are dark and others light. The interpretation that is put on this variation is, that the Moon, like the Earth, is composed of rocks of many different tints; that the large spaces I now indicate, and which used to be called seas, are made up of a darker rock than the volcanic southern regions. At the tip of the rod, the volcano Copernicus has ejected a lava whiter than the plains over which it has flowed. Observe how far the stream running north has gone; let me give you a scale of miles: this picture is 12 feet in diameter; it shows the Moon as she would appear to us if we were 166 miles from her, instead of 240,000, as we now are. Every foot length in the picture is about 180 miles. You will see that the lava stream running north has gone not less than 600 or 800 miles.

I have said that this lava is running across a plain. Why do we not call it by the old name, a sea—the Sea of Showers? If you will look closely and reason a little, the cause will be apparent enough. If this dark spot were a sheet of water it would present a uniform grayish or greenish tint. But we see it diversified with mottlings of light and shade, bright points and streaks of white lava. It must be land.

In the next place, we will examine the straight or rugged side of the picture. On casting the eye along this part it will at once be noticed that it is irregular and seems to be thickly dotted with depressions of a saucer shape. It is sometimes said that the Moon looks as if she had suffered from an attack of small-pox. What is the nature of these marks?

Let me observe that there are not on the Moon a large number of mountains, truly speaking—that is, ranges of projecting peaks. The best example of them is this range, the "Lunar Apennines;" they are perhaps 400 miles long at this part, and 15,000 feet high.

You may ask how we know that one spot is a mountain, another a crater. It is by observing the direction in which the shadows are cast. The Moon does not shine by her own light, but is seen by light

falling on her from the Sun and reflected to us. The Earth is just as bright to her as she is to us. When the Moon is at half, as she is represented in this photograph, the light falls obliquely on the part we have called the rugged edge, just as at sunrise on the Earth. Every object that projects is bright on the side toward the light, and in shadow on the opposite side, while every excavation or pit is in just the reverse condition—bright on the side from the Sun, and dark on the side toward him. Bearing this in mind, let us investigate some of these spots in the Moon. The Sun is away toward the left hand; in the Apennines the bright side is toward the left, and the dark toward the right. They are therefore, according to our rule, projections. But in this crater the dark side is toward the left, and the bright toward the right. It must be a pit.

In this crater, named after Aristillus, you will observe a peculiarity common to many of the craters. It has in the centre a small bright dot, resulting from light falling on a conical mountain. This same central cone is seen in certain volcanic mountains on the Earth, as in Vesuvius for example. Any one who has ascended it will remember that the cone which now emits lava occasionally is surrounded at a distance by an old crater, just as if in the centre of a saucer a small pile of sand should be placed; the latter would represent the cone, while the rim of the saucer would be the wall of the crater. Here I point out another named after Eratosthenes; here another, etc.

The various craters in the Moon have been named after distinguished men; this one, for instance, is Copernicus, who revived the doctrine that the Sun is the centre of the Solar System; this after Kepler, the discoverer of three great astronomical laws; this after Tycho Brahe, the Dane; this after Plato, etc. The dark parts are named from imaginary qualities they were supposed to possess; this is the Sea of Showers, or Mare Imbrium; this the Oceanus Procellarum, or Ocean of Storms; this the Sea of Vapors.

Along the extreme edge of the Moon many points are seen apparently altogether disconnected from her. These are the tips of mountains, or the rims of craters, on which the sun-light is falling while it does not reach their bases. On the Earth the Sun in rising illuminates first the peaks of mountains, and then the light gradually creeps down their sides until they are all lightened up. So it is in the Moon. If the photograph had been taken a little while later than it was many of these bright points on the edge would have disappeared, because this is a photograph of the waning Moon; they were depicted just as the Sun was setting on them.

Why is it that the parts on the left hand of the picture are of so uniform a brightness, and do not show craters and peaks too? It is because the light is there falling perpendicularly on the surface and illuminating all parts uniformly. If a person were suspended in a balloon over the Earth, and the Sun were overhead, he would find difficulty in distinguishing a mountain from the valleys around if similarly composed. But in the morning, when the Sun's rays strike the surface obliquely and the mountains cast a shadow, there would be no difficulty. The part of the Moon on the extreme left is here seen at mid-day, so to speak, that at the rugged edge at evening.

And now what is to be said on the subject of Plurality of Worlds is about finished. We have taken a glance at the celestial bodies, and shown that on one of them, a near neighbor, Mars the conditions exist necessary to animated beings. From it we may extend the observation to some of the rest. I could not offer you positive proofs, but have indicated how strong the probabilities are of inhabitation. In all such investigations it is necessary to be very careful in drawing conclusions from what we may see. The senses alone often deceive us, and results derived from them must be corroborated by our reason. Many instances could be adduced in proof of this assertion, and none more striking than those in connection with the body whose description has occupied so much of this evening.

It is generally supposed that the rays proceeding from the Moon are so cold as to produce refrigeration in bodies exposed to them. This property has been a favorite subject of comparison with poets, as a thousand quotations concerning her cold, pale light would prove. In the old Mythology the lack of warmth of Diana was typified by this body. But what are the facts in the case? The Moon reflects to us a certain proportion of heat from the Sun, and by thermometers sufficiently delicate the amount may be measured. An ordinary mercurial thermometer fails entirely to show any rise, though the moonbeams be concentrated by ever so large a lens. But if two wires, one of bismuth and the other of antimony, be soldered together at the ends, an exceedingly slight warming at the junction will cause an electrical current to be developed. By appropriate contrivances we are able to measure the strength of the current, and as it bears a relation to the amount of heat employed, thus measure that heat. A number of pairs of such metals soldered together is called a thermo-electric pile. By the thermo-electric pile $\frac{1}{74.56}$ of a degree may be indicated. The moonbeams warm us to about this extent. To be sure the amount is

(2) Here was exhibited an enlarged view of a photograph of the Moon. The picture was about 12 feet in diameter: the light and shade, craters, mountains, etc., were shown beautifully defined.

not great, but it is sufficient to overturn the idea of her cooling agency.

In another instance a deception of the eye is shown. When the moon is rising it is generally conceded that she is much larger than when near the zenith. She seems as large as a cart-wheel, while overhead the diameter is not greater than a plate. Any one who doubts this doubts the evidence of the senses. And yet measured with the telescope the size is seen to be the same on each occasion. Does not such a fact shake our confidence in the eye?

A still more common deception which astronomers have to combat is that connected with the apparent size of the Moon. When it was stated a moment ago that overhead she seems as large as a plate, no dissent was expressed, because almost every one feels convinced that such is the fact from repeated observation. But yet by two simple experiments our faith in that can be altogether broken. Many times the inquiry is made in my observatory, "How large do you take your photographs of the Moon in the telescope?" On returning the answer that they are magnified 15 times by the instrument, and then showing a specimen about an inch and a half in diameter, persons either say, "This is smaller than the Moon," or else express their disbelief in a yet more marked manner by a silent dissent. The size of the Moon as seen by the naked eye is about that of a pepper-corn. Now that I know this to be the case she has lost her former magnitude to my eyes. In order to convince persons it is only needful to cause them to hold up such a photograph (about as large as a half dollar) at the distance of distinct vision, 10 inches, and then look at the Moon through it. At once her size dwindles away; we have established at standard of comparison, and see how great the deception was.

In another way any one who has a spy-glass mounted on a stand can convince himself of the same thing. If the instrument magnify only 6 or 8 times, on looking through it at the Moon, she seems to be smaller than to the naked eye, possibly not larger than a penny. But if while one eye is still kept at the eye-piece of the telescope the other be opened, two moons are seen, a small one not as large as a pea, and another 6 or 8 times as great. By shutting first one eye and then the other, it can be shown that the small one is that seen by the naked eye. After repeating such an experiment several times the effect is permanent, the Moon looks always small, but if only once performed on going away from the telescope we again delude ourselves.

In producing this photograph on the table, 21 inches in diameter, a magnifying power of about 200 has been used, and yet it seems no larger than half the rising Moon. But why is it then, if the size is the same in both cases, that we do not see with the naked eye the craters and cones and other parts as we see them here. No one is apt to amuse himself with imagining the face of a man in the Moon depicted on this paper; his attention is too much occupied with a multiplicity of details far more interesting. Not much reasoning is required to satisfy the mind that the greater distinctness of parts must arise from the fact that the photograph is a magnified representation.

The Moon varies in her distance from the Earth considerably at different times. She should seem, therefore, on some occasions, much greater in size to us than on others. And yet who remarks the change in apparent diameter. A series of photographs taken on various occasions vary in size very materially, and bring this fact before us in a forcible manner. Yet the eye commits in this case a sin of omission.

In yet another instance the unreliability of the senses is shown when not corrected by reason. We see the Moon and Stars before they have risen and after they have set. We never see them in their true positions, except in the rare case when they are directly overhead. The refractive action of the air lifts them out of their places, and astronomers in measuring the position of celestial bodies have to make a correction for this disturbance. It is generally supposed that we see in a straight line, but in looking at these bodies the light has reached the eye through a curved path.

In reasoning then on such a subject as that which has occupied us this evening, we are admonished not to let our senses and imagination carry us away. Do not speculate on the nature of beings on other spheres as some have done, and attribute to them a variety of qualities corresponding to their supposed surroundings. Do not, with Fontenelle, give to the inhabitants of the hot planets, Mercury and Venus, characteristics in an exaggerated degree like those possessed by the inhabitants of our warm climates, doubting not that Venus is the seat of an empire where ardent affection rules, while in Mercury the vivacity of the inhabitants is so great that it is the Insane Asylum of the Universe; from the coldness of Jupiter and Saturn imagining that they are peopled with phlegmatic and slow-moving inhabitants. Do not propose for comets the function of penal settlements for the planets, their wretched inhabitants being whirled, for sins committed, through fierce extremes of heat, now approximating the sun

and made two thousand times as hot as molten iron, now traversing space 100° below zero.

A calm consideration of the facts collected on this subject, after due weight has been given to the able arguments advanced on either side, would seem to lead to the following conclusions: First, we have reason to know that the various bodies of the solar system have a composition resembling one another; on the Sun, the most unlikely of all, many of the elements of the Earth are found, iron, sodium, etc. This remark may be extended to the fixed Stars.

Second, we feel satisfied that the same laws which rule the solar system rule the Universe; in the case of the law of gravity a demonstration can be easily offered, the binary Stars revolving around their common centre of gravity according to it.

Third, we may be sure that Nature, operating upon like substances by similar laws, will ever produce the same results. There is a unity of scheme pervading the Universe, there are immortal types or exemplars, the Divine Ideas, according to which things are framed with an infinite variety of modifications, depending on the surrounding physical conditions. I can not believe that on our little globe alone, among the infinity of worlds, life has been possible, because only on it surrounding circumstances have been favorable. It seems more in accordance with reason to believe that there may be on many other globes intelligent beings, formed on the same plan as we are, but differing, on some perhaps for the better, on others for the worse. On our own globe we see what an influence such conditions as heat, moisture, etc., have on the inhabitants of the various zones. At the poles, where man struggles with difficulty to procure a precarious livelihood, intellect is at a low ebb, and exhausts itself in efforts to obtain food; at the equator, amidst the bounteous provision on every hand, mind and body are oppressed by a languor that seems only broken by the passions. In the temperate zone, our own happy latitude, the seasons conduce to activity; but thoughts of subsistence need not occupy all the time, enough can be spared to originate the most sublime ideas in science and the arts. It must be thus in the universe; though the general plan is the same throughout, there may be worlds that have never passed the state ... which the earth was in early geological times, while on others conspiring circumstances may have allowed life to develop even beyond our standard, and to reach a point that we may hope in the future to attain.

OFFICIAL NOTICES.



APPOINTMENTS.

SCHOOL COMMISSIONERS.

His Excellency the Governor General in Council was pleased, on the 25th May last, to appoint Rev. François-Xavier L. Yézina to be a School Commissioner for the Municipality of Ste. Justine de Newton, in the County of Vaudreuil.

DIPLOMAS GRANTED IN THE NORMAL SCHOOLS.

M'GILL NORMAL SCHOOL.

Academy diploma.—Edward H. Krans, B. A., of Frelighsburg; John Morrison, B. A., of Waddington; Ezra Ball, of Boiton, hon. mention in Trigonometry.

Model School diploma.—Duncan McCormick of St. Louis de Gonzague Prince of Wales Medal; hon. mention in English Grammar, English Literature, Writing, Geometry, Natural Philosophy, Natural History, Agricultural Chemistry, Drawing and Latin; James Alexander Hume, of Leeds, hon. mention in Geometry, Natural Philosophy and Agriculture. Chemistry; Eliza Curry, of Oshawa, hon. mention in Mensuration and Arithmetic; Leuitia Barlow, of Montreal, hon. mention in Reading and Latin; Lucy Maria Gillies, of Eaton, hon. mention in Agricultural Chemistry; Henrietta Fuller of Newcastle; Mary Grahame, of Montreal, hon. mention in Reading; Louisa Teresa Coates, of Montreal.

Elementary School diploma.—Agnes Cairns, of Montreal, hon. mention in History, English Grammar, French and Drawing; Margaret Ritchie, of Montreal, hon. mention in English Grammar, Arithmetic and French; Louise Chappuis, of Shipton, hon. mention in French, Chemistry and Natural History; Lucy Ann Lawless, of Beech Ridge, hon. mention in French, Chemistry and Natural History; Harriet Newell Jiggins, of Leeds

hon. mention in History, Geography, Arithmetic and Geometry; Elizabeth Strickland, of Buckingham, hon. mention in History, Arithmetic and Natural History; Mary J. Graham, of Ormstown, hon. mention in Arithmetic, Algebra, Geometry and English Grammar; Isabella Mathieson, of Chateauguay; Valeria Mansur Taylor, of South Bolton; Margaret Fleck, of Montreal; Elizabeth Dingwall, of Glengary, hon. mention in Geography; Eliza Luttrell, of Montreal; Helen Henry, of Montreal, hon. mention in Algebra; Agnes Ogilvie, of North Georgetown; Margaret L. Blow, of Lachute; Cordelia Young, of Montreal; Esther Maver, of Montreal; Marion R. C. Holmes, of Montreal; Mary Ross, of Martintown; Jane Fraser, of Montreal; Adelia Elsie Fessenden, of Mansonville; Alison E. Taylor, of Montreal; Agnes Stewart, of North Georgetown; Jane Powell, of Tanneries; Elizabeth Hamilton, of Georgeville; Esther Millen of Montreal; Henrietta Rollit, of Rawdon; Sarah C. Lapard, of Montreal; Mary St. James, of St. Constant; Alice L. Warren, of Montreal.

June, 1866.

DIPLOMAS GRANTED BY BOARDS OF EXAMINERS.

MONTREAL BOARD OF PROTESTANT EXAMINERS.

1st Class Elementary (F)—Jean Roy; Marie Séguin; (E)—Walter Sutherland; Ida Louisa Smith.

2nd Class Elementary (E)—Isabell Adams, Janet Blackwood; (E. & F.)—Rosanna Alice Busby; (E)—Annie Jane Caldwell, Amelia Cousins, Ann Jane Craik, Katie Elizabeth Greene, Elizabeth Beda Keet, Eliza McKay, Adelina Malissa Richardson, Sarah Anne Sawyer, Sarah Melissa Terry and Marion Wallace.

May 17, 1866.

T. A. GINSON,
Secretary.

MONTREAL BOARD OF CATHOLIC EXAMINERS.

1st Class Model School (F)—Hubert Doré and François-Xavier Hétu.

1st Class Elementary (F)—Elmire Adam, Azzélie Pulchérie Angers, Marie Elias Bedard, Rose-de-Lima Bizaillon, Victoria Boivin; Aristide Boulay; Marie Cadotte, Hermine Caron, Céline Gastonguay, Vitaline Champigny, Mélina Chaput, Arsélie Charbonneau, Monique Chartrand, Angelina Charet, Azilda Daigneault, Delvina Desmarais, Antoinette Pulchérie Drapeau, Marie Louise Dudemaine, Célanire Dufresne, Virginie Dumouchel, Philomène Duprat, Eulalie Philomène Durocher, Rosanna Durocher; (E)—Margaret Fleming; (F)—Marguerite Gauvin, Joséphine Giroux, Georgina Grandpré, Joséphine Guibord, Azéline Lacasse, Marie Clara Lalanne, Nancy Lanorgan; (F. & E.)—Jane Lavau du Lavue; (F.)—Philomène MacSewell, Hedwidge Martel, Marcelline Mongeau; (E)—Mary Ann Atterson; (F.)—Secondine Pepin, Marie Louise St. Aubin; Louis Beaudry.

2nd Class Elementary (F)—Olive Bourque, Aglaé Christin St. Amour, Carmélie Fournier, Elodie Gaudet, Céline Graton, Julie Laferrière, Marie Mayer, Eléonore Trahan, Léopoldine Tremblay.

May 1, 1866.

F. X. VALADE,
Secretary.

BOARD OF PROTESTANT EXAMINERS OF QUEBEC.

2nd Class Elementary (E)—James Daly; Annie McIntyre.

May 1, 1866.

D. WILKIE,
Secretary.

BOARD OF EXAMINERS OF BEAUCE.

1st Class Elementary (E)—Mary Brennan.

May 1, 1866.

J. T. P. PROULX,
Secretary.

BOARD OF EXAMINERS OF RIMOUSKI.

1st Class Elementary (F)—Philomène Lavoie, Marie Emélie Martin, Marie Rose-de-Lima Maot dit Labrie.

1st Class Elementary (E)—Margarat Christina Macalister and Julia Ritcher Macalister.

2nd Class Elementary (F)—Marie Louise Lepage.

May 1, 1866.

T. G. DUMAS,
Secretary.

BOARD OF EXAMINERS OF CHARLEVOIX AND BAGUENAY.

1st Class Elementary (F)—Philomène Lagacé, Geneviève Lapointe and Victoria Tremblay.

CHS. BOIVIN,
Secretary.

JOURNAL OF EDUCATION.

MONTREAL (LOWER CANADA), JUNE AND JULY, 1896.

Fête of the Pupils of the College of Nicolet.

A very interesting fête took place on the 24th of June at the College of Nicolet, where its former students had met for the purpose of giving public expression to the sentiments of gratitude and respect entertained by them for this Seminary.

Early on the morning of that day, the little steamboats *Mouche-à-Feu* and *Castor*, gaily decorated with flags, left Three Rivers for the village of Nicolet, having on board the invited guests, who had come from all parts of the country to join in the celebration. On their arrival at Nicolet they were met by a number of the pupils and the inhabitants of the neighboring parishes, the college band being also in attendance. They then formed a procession, and as they entered the fine avenue which opens in front of the college, a salute of several guns was fired, and a company of the students presented arms. On reaching the principal entrance to the college, they were received by the Rev. Superior and his staff of professors; here an address was presented by the Hon. Justice Mondelet. Immediately after which, they attended mass in the chapel of the Seminary, *Monseigneur* Baillargeon officiating; their Lordships Bishop Cooke, from Three Rivers and Bishop Bourget, from Montreal, formerly students or professors of this college, were also present, together with many members of the clergy and laity.

During the intermission which followed this ceremony, every one took advantage of the opportunity to visit the halls, gardens and adjoining woods, where many of those present had often spent their time in study and amusement, and which brought back to their minds many pleasant recollections of the past.

After the banquet, which on account of the uncertain state of the weather was held in two of the principal halls of the college instead of under canvas in the play-ground as originally intended, the guests numbering upwards of seven hundred, assembled in an other apartment, which had been handsomely decorated for the occasion. Among the many appropriate devices and inscriptions that adorned the walls, the following was not the least conspicuous: *Circumdabo illos quasi coronam mihi*. The proceeding opened by an address, presented to the venerable *Monseigneur* Cooke, one of the last survivors of those who attended the first course of studies pursued in this college; the bishop's reply being read by his former secretary, Mr. Désilets. Discourses were then delivered by *Monseigneur* Baillargeon, and by *Monseigneur* Bourget who, after a very touching address, quoted the following appropriate text from the Scriptures, which was received with loud applause: *Surge illuminare, Jerusalem, leva in circuitu oculos tuos ecce filii congregaverunt afferentes munera.*

The presents given by the pupils of the Seminary of Nicolet to their *Alma Mater* deserve to be enumerated; they consisted of an organ, which is at present, we believe, in the chapel of the college; a magnificent album, containing all their portraits and inlaid with silver plates on which were engraved appropriate designs and mottoes, and a fine edition of the *Oeuvres complètes de St. Thomas d'Aquin*, in twenty-eight volumes, folio, now being issued at Parma and which is considered as one of the finest specimens of modern typography.

Addresses were made by the Hon. Messrs. Chauveau, Mondelet and Loranger, E. Carter, Esq., Q.C., Montreal; Rev. Mr. Lafèche, G. V., and the Rev. Mr. Desaulniers of the Seminary of St. Hyacinthe. Mr. Carter, in the course of his remarks, spoke of the admirable system followed in the Catholic institutions of the country with reference to education, which system, he said, he had on more than one occasion defended when among his Protestant friends. He also bore testimony to the liberality and religious toleration shown by those presiding over the studies, adding that during his long stay at the College of Nicolet on no occasion did the least circumstance occur which could possibly have hurt his feelings as a British Canadian and a Protestant.

All the speakers whom we have named are old pupils of the College of Nicolet, with the exception of the Superintendent of Education, who however claimed the honor of being to a certain extent connected with Nicolet, as his father had received part of his education in this college.

In the addresses delivered honorable mention was made of the former students, either now dead or absent, who had distinguished themselves in their respective careers, and also of the venerable founders and benefactors of this educational establishment, whose names and portraits could be seen in the hall where this meeting was held. Among the latter appeared the names of Messrs. Brassard, Raimbault and Leprohon, Mgr. Plessis and Mgr. Sinay; among the former students were Mgr. Provancher and the well-known French Canadian writer the late Rev. Mr. Ferland, and the Hon. Messrs Drummond and Trecotte.

Among the old pupils present besides those we have named, were Rev. Mr. Cazeau, G. V., Rev. Mr. Caron, G. V. of Three Rivers, Rev. Mr. Hébert, *curé* of Kamouraska, Rev. Mr. Harper, *curé* of St. Grégoire, Rev. Mr. Harkin, *curé* of St. Columban, Rev. Mr. Ricard, late *curé*, Rev. Mr. Quertier, late *curé* of St. Denis, Hon. A. A. Dorion, Rev. Mr. Dorion, *curé* of Yamachiche and two other gentlemen of the same name, Hon. Messrs. Bureau, Proulx and Olivier, P. R. Lafrenaye Esq., advocate, Montreal, Mr. Hubert, Inspector of Schools, Three Rivers, Mr. Guillet, one of the veterans of French Canadian literature, Rev. Mr. Doucet, *curé* of Malbaie, Rev. Mr. Baillargeon, *curé* of St. Nicholas and brother to the Bishop of Tloa, Dr. Beaubien, of Montreal, and many other priests and laymen.

After this interesting meeting, which was enlivened by music, vocal and instrumental, a *Te Deum* was sung in the chapel.

In 1803, Rev. Mr. Desrochers, following in the footsteps of his predecessor, Rev. Mr. Brassard, opened the first Latin classes. The old college which still exists, was built some years later, and the fine building in which the above *fête* took place was commenced on the 31st May, 1827.

Public Instruction in Nova Scotia.

The following details, reproduced in a condensed form from the report of the Superintendent of Education for Nova Scotia, which we have just received, will be found to contain valuable information, especially as regards the public schools and progress of education in that Province.

According to the above report the number of the inhabitants of Nova Scotia is about 400,000, of whom the majority are of British origin, and the number of the different religious denominations not less than twenty-two, the R. Catholics numbering 87,000, the Presbyterians 70,000, and the Episcopalians 48,000. There are about 850 churches, making an average of one for every 400 inhabitants. The principal educational institutions are, the colleges of St. Francis Xavier, Antigonish; St. Mary's, Halifax, under the direction of Roman Catholic priests and receiving each an annual grant of \$1200 from the government; the Presbyterian Theological Hall; Dalhousie, at Halifax; King's College, Windsor; Acadia, Wolfstown; Mount Allison, Sackville; ten town and four county academies, one normal school, and a provincial institution called Model School, with a farm attached for practical instruction in agriculture. The country is divided into thirty-four districts, which are subdivided into 1421 sections, for school purposes. The number of schools in operation last year, was 763 during winter, and 989 during summer.

Number of male teachers employed:

	1st term,	2nd term.
1st class.....	126.....	157
2nd "	145.....	167
3rd "	194.....	160
Belonging to no class in particular.....	62.....	28

Number of female teachers employed:

	1st term,	2nd term.
1st class.....	70.....	119
2nd "	85.....	169
3rd "	86.....	179
Not classified.....	33.....	54

The number of pupils who attended school during the last term of 1865, was 43,771.

The school organization and the duties performed by the several school functionaries are the same as in Canada, with this difference however, that the district commissioners have the right to grant teachers' diplomas as our Boards of Examiners.

The annual grant accorded by the government is \$90,000, and the contributions, voluntary or otherwise, amount to three times that sum; this grant is divided among the thirty-four districts according to the population of each, and the school commissioners distribute it among the teachers on the same principle.

Mr. Rand, the Superintendent, considers the system of distributing the funds in proportion to the population as very defective, and has applied to the Executive to have it changed, and to substitute an equal division among all the teachers according to the class to which they belong, giving first class male teachers \$120, second class \$90, third class \$60; female teachers, first class \$90, second class \$60, third class \$45. The assistant teachers, whether male or female, to receive a part of the grant according to their capacity and length of service.

Taking the number of sections into consideration it is rather

surprising that there are only 989 schools in operation, but Mr. Rand attributes this disproportion to the recent changes in the educational system which have overturned the old routine countenanced by a part of the population, and established a new system, thus causing hesitation and delay in the execution of the law. Besides this, many of the sections not having any schools in operation, were employed in erecting and repairing their school-houses. The last Act passed by the legislature to regulate the system of education has caused a great step to be made towards the advancement of the country. The Superintendent takes an active part in this work, suggesting new ideas and striving to surmount difficulties; the energy displayed by him in resisting prejudices seems highly commendable.

The Superintendent's report purports to contain a correct statement of the condition of education in the colony, and gives an interesting view of his system of school organization, which may be considered as a protest against the abuses and prejudices favored by a certain class of people, and the vague aspirations after ideal perfection indulged in by others.

While a portion of the people oppose the introduction of compulsory taxation altogether, others would have the schools supported entirely from the public revenue, and demand that a general system of taxation be adopted for this purpose. Mr. Rand rejects the views entertained by these parties and ably maintains that they are either inconsistent with the educational requirements of the country or wholly impracticable.

A glance at the history of the colony shows that education had at a comparatively recent period, made as yet but slow progress. Eighty years ago not a single school existed in the populous county of Pictou, whereas the number reported for the year 1865, is 120. In 1787, only thirty schools could be found in the whole province and Cape Breton. The annual grant accorded by the government about thirty years since, was \$16,000, and at that period children in most cases were taught at home by their parents, there being but few persons found willing to enter upon the duties of a schoolmaster, and these not unfrequently incompetent. This is in striking contrast with the present condition of the schools. The grant now is \$90,000. The two provincial establishments known as the Normal School and Model School, founded in 1855 and 1857, have provided the most distant districts with teachers of first class merit and capacity. Nowhere are the educator's services more properly appreciated. Some teachers receive \$600 a year, and none less than \$180, a liberality which must contribute materially to their encouragement and success.

The educational institutions of Nova Scotia have sent out but few literary men as yet, and the books published in England and the United States supersede in a measure native productions; nevertheless, the writings and works of Sam Slick (Judge Haliburton), John Young, Professor Dawson, the able Principal of McGill University and McGill Normal School, Professor Syall, Rev. George Paterson, and of several others, would not be unworthy of a place in an English or American library.

Twenty-ninth Meeting of the Teachers' Association in connection with Jacques-Cartier Normal School, held 25th May, 1866.

Present,—Abbé Verreau; Mr A. Duval, Professor in the Normal School; Messrs Caron and Grondin, School Inspectors; Mr J. E. Paradis, President; Mr Emard, Vice-President; Mr D. Boudrias, Treasurer; Messrs H. Bellerose, H. E. Martineau, H. T. Chagnon, J. B. Priou, members of the Council of the Association; Mr J. O. Casségrain, Secretary; Messrs U. E. Archambault, D. Bourbonnière, J. E. Roy, S. Boutin, S. A. Longtin, L. T. René, L. N. Desjardins, A. Guibord, A. Lanctôt, G. Martin, E. Boutin, P. Campbell, S. A. Aubuchon, J. E. Girard, G. T. Dorais, N. Paquin, A. Malette, L. Verner, J. B. Delège, C. Ferland, E. Lusignan, J. Gariépy, and the pupils of the Normal School.

The minutes of the meeting held in January were read and adopted.

The following members were appointed office-bearers for the ensuing year: Mr J. E. Paradis, President; Mr Emard, Vice-President; Mr J. O. Casségrain, Secretary; Mr D. Boudrias, Treasurer; Mr G. T. Dostaler, Librarian.

On a motion by Mr Emard, seconded by Mr Casségrain, Messrs U. E. Archambault, H. E. Martineau, H. T. Chagnon, D. Bourbonnière, J. B. Priou, and H. Bellerose were appointed members of the Council of the Association.

Mr J. E. Roy read a paper entitled *Ireland*.

The following subject was then discussed: "Of all the French grammars used in this country, particularly those of Bonneau, des Frères, Julien, and Poitevin, which is best adapted to the use of our schools?"

Mr Emard having opened the discussion with some remarks on the above grammars, expressed himself in favor of the *Frères'*, which, he said, was used in almost every school, and from its style was well adapted to the intelligence of children, an advantage which in his opinion was seldom met with in the other grammars, more especially in that of Poitevin, whose language was too technical for beginners.

Mr Inspector Caron, Messrs Martineau, Bourbonnière, and Priou expressed themselves equally in favor of the *Frères'* grammar.

Mr Archambault made a concise analysis of the above mentioned grammars, and was of opinion that each had its advantages; but did not hesitate to say that he regarded Poitevin's grammar as the code of the French language, and hoped to see it adopted by the Council of Public Instruction.

Mr Boudrias was of the same opinion.

Abbé Verreau also took part in the discussion. He said that all these grammars were the fruits of laborious study, that he however preferred Poitevin's, as it was the result of many years' experience in teaching and approved by the Council of Public Instruction in France. It had been published in three different forms, entitled respectively *La Grammaire du Premier Age*, which though rudimentary, was complete in itself; *La Grammaire Élémentaire*, containing the same rules, but much more developed; and *La Grammaire Complète*, which might be regarded as the philosophy of grammar; this course being perfectly in accordance with his idea of logic and of teaching, which was to proceed from the simple to the compound; for it was by being continually repeated that lessons became more deeply impressed on the memory. He further observed that it would be necessary to continue the discussion of this subject, and indicated the means of deriving the greatest benefit possible from it; he then alluded to the modifications to be introduced into the system of education established in this country, and reviewed successively those followed in France, England, Italy, and the United States, pointing out what he considered to be defective in these systems with regard to religion and morals, the basis of all sound education, and added that instruction should never be separated from education. The Rev. Principal then closed his address with appropriate remarks touching the part borne by the educator in the progress of civilization.

Mr Longtin gave a lecture on *Blood*. He spoke of the constituent elements of this fluid, and of its two essential parts, the serum and the globules, of the number and form of these globules, and the different colors which they assume in different animals; ending with some observations on the coagulative properties of the blood and the causes which accelerate or retard its coagulation.

It was then moved by Mr Archambault, seconded by Mr Bellerose, and unanimously

Resolved,—That a vote of thanks be tendered to Abbé Verreau and Messrs Caron and Grondin for assisting at the present convention and for the good advice they were pleased to give.

It was also resolved that the discussion on the French grammars should be resumed at the next meeting.

Mr Boudrias promised a paper on this subject.

Messrs A. Dalpé, M. Guérin, C. Gélinas, J. E. Labonté and H. R.

Martineau were requested to prepare essays for the next convention.

Moved by Mr Boudrins, seconded by Mr Cassegrain, and
Resolved,—That the meeting be adjourned to the last Friday in August next, at 9 A. M.

McGill Normal School.

The distribution of diplomas and prizes to the teachers in training at this Institution took place in the Hall of the school yesterday afternoon at 3 p. m. The Hon. P. J. O. Chauveau, the Superintendent of Education, presided, and there was a very respectable attendance of the friends of Education. On the platform were: Princ. Dawson, Prof. Hicks, Prof. Davey, Prof. Robins, Prof. Andrews, Prof. Baynes, and the following members of the Protestant Board of Examiners: Rev. Dr. Jenkins, W. Lunn, T. A. Gibson, M. A., and A. N. Rennie. After prayer by the Rev. Dr. Wilkes

The Hon. the Superintendent delivered a very appropriate address, before the prizes were presented. He dwelt upon the advantage of good school teachers, which like a good mill would bring people to patronize it. The Council of Public Instruction had done what it could to extend the work of Education, but the matter was left to a great degree in the hands of the teachers themselves. He deprecated over zeal on the part of those charged with the education of the young. There was a good deal of diplomacy required in a school. The teacher must make himself beloved and popular,—liked by the parents as well as the children. He gave the teachers about to receive their diplomas some very sound and practical advice. And in conclusion, he congratulated the Principal and Teachers upon the work that had been done, and the success attending it for the last ten years. He referred to the penuriousness of the School Commissioners generally, who expected the Government was to pay the Teachers everything, and the people gave nothing. He had, in districts where he knew the people were able to pay, to exert his authority and teach the Commissioners a lesson. He had stopped the supplies, not a very pleasant way of doing business, or very agreeable to any of the parties concerned, but still the only way to bring them to their senses. It was his anxious desire to raise the character, the status and position of the Teacher, to the utmost of his power. Nothing would give him greater pleasure than to assist them in their good work—in their noble mission. He hoped they were up to the importance of it—that their hearts were disposed to fulfil it, and he prayed that they would have all success and all prosperity in the work they had taken in hand. (Applause.)

Principal Dawson read the list of Diplomas as follows, and he made the following statement as to the progress of the School: One diploma had been given early in the Session to a graduate of McGill University, under the regulation of the Council of Public Instruction, and forty would be given to day, making forty-one in all. Of these, three are for Academies, eight for Model Schools, and twenty-nine for Elementary Schools. The total number of diplomas granted by the School since its commencement in 1857 is 396, and the total number of persons who have received diplomas is 302. Of these more than 200 are known to be, or recently to have been, engaged in teaching, and it may be estimated that not less than five thousand children throughout Lower Canada are directly through their agency, at this moment, receiving benefit from this School; while the whole number that have received such benefits during the nine years of the existence of the School must be vastly greater. In this, the tenth year of the School, it may be allowable shortly to sum up the good it has done in various ways. It has greatly improved the qualifications of teachers; it has sent out as useful educators, fully equipped for their work, a large number of young persons who might otherwise have been of comparatively little value to Society. It has contributed largely to the establishment of good schools in localities which might otherwise have been destitute of such influences. It has offered an honourable profession for the daughters of widows and of persons reduced in circumstances, and for young women of more than average talent, and under the necessity of providing for their own support. It has contributed to raise the remuneration of the teacher, and the estimation of his services. In short, it has furnished a centre of educational light which has extended its influence throughout the whole extent of this Province; for we have had pupils from all parts of Lower Canada, and have sent teachers to its extreme limits East and West, North and South. It is the grand distinguishing characteristic of a school of this kind, that it trains minds, not for the pursuit of ordinary professions or for the prosecution of selfish ends, but for the advancement of the great work of education itself; and I feel the utmost confidence that our pupils go out from us with an enthusiastic desire to advance this great cause. It is well known to the Superintendent of Education, who has steadily fostered these schools,

that all that I have said of this school may be equally affirmed of the other Normal Schools of Lower Canada. To the influence of such schools, either directly or indirectly, the British Provinces owe the greater part of the good elementary education now being communicated, and on them to a great extent depend all rational hopes of its future progress. My first experience of Normal Schools was in visiting those of Massachusetts and New York in 1851, with the view of collecting information for the establishment of such a school in Nova Scotia. One of my last educational offices in that Province was in acting as a Commissioner for the foundation of its Normal School, which has been so successful under my friend Dr. Forrester. I had not been many weeks in office as Principal of McGill University, before it was intimated to me by a person high in authority in this country, that one of the things expected of me was to take an active part in instituting such a school here. I felt then that such a work would be most important,—scarcely second to that of the University; and from year to year I have become more and more fully convinced of the paramount importance of this work, and that well-appointed Normal Schools must be the vital centres of good education for any country; and that no expenditure, whether of the public money or of the higher kind of educational talent, is more profitable. I would further add, in regard to this school in particular, that its success is mainly attributable to the zeal and ability of its professors and teachers, who have throughout its whole existence worked with the most earnest and self-sacrificing energy for the benefit of our teachers in training; and have in this furnished one of the most important elements of the efficiency of such a school,—setting an example of disinterestedness and zeal to the young people under their care.

The Prizes were distributed by Hon. Mr. Chauveau as follows:

LIST OF DIPLOMAS GRANTED IN THE MCGILL NORMAL SCHOOL. JUNE 1866.

ACADEMY DIPLOMA.

Edward H. Kranz, B.A., of Fielighsburg.
 John Morrim, B.A., of Waddington.
 Ezra Bull, of Bolton—hon. mention in Trigonometry.

MODEL SCHOOL DIPLOMA.

Duncan McCormick of St. Louis de Gonzague—Prince of Wales Medal; hon. mention in English Grammar, English Literature, Writing, Geometry, Natural Philosophy, Natural History, Agricultural Chemistry, Drawing and Latin.

James Alexander Hume of Leeds—hon. mention in Geometry, Natural Philosophy and Agricultural Chemistry.

Elora Curry of Oshawa—hon. mention in Mensuration and Arithmetic.

Letitia Barlow of Montreal—hon. mention in Reading and Latin.

Lucy Maria Gillies of Eaton—hon. mention in Agricultural Chemistry.

Henrietta Fuller of Newcastle.

Mary Grahame of Montreal—hon. mention in Reading.

Louisa Teresa Coates of Montreal.

McGill Model School.

Yesterday afternoon the distribution of prizes took place at the Model School, Belmont Street, the examinations having previously taken place in the morning. Before the proceeding commenced the boys of the Model School Drill Association, together with the other boys of the school, were put through a course of drill, by their drill instructor. The Drill Association, with their carbines and grey uniforms, look very neat, and the whole of the boys went through a series of company and battalion movements in a very creditable manner, a large number of the friends of the boys being present. At 3 o'clock an adjournment was made to the upper hall of the building, where the pupils, of both the girls and boys departments, were assembled, together with a large number of their friends. The Chair was taken by Principal Dawson, and upon the platform were Professor Robins, Mr. McGregor, Mr. Fowler, and other teachers of the school.

The proceedings commenced by a song, sung very well by the younger children, Mr. Fowler presiding at the piano. The subjoined prize lists were then read, the proceedings being varied by several songs by the pupils, whose discipline and appearance we may add reflected every credit on their teachers.

PRIMARY DEPARTMENT.

JUNIOR SECTION.

Good Conduct—Harry Woodcock, Samuel Grant, Barbara Slate, Annie McLaren, Ellen McLaren, Murian O'Grady, Martha Craig,

Margaret McBride, Margaret Maxwell, Frederick Larmouth, Isabella Craig, Augusta Gibb, Jeannie Elliott.

General Improvem.—Florence Elliott, Agnes Burnet.

SENIOR SECTION.

5th Class—Agnes Maxwell, prize for good conduct and arithmetic; Fanny Gould, prize in geography; Jessie Gibson, reading; George Stevenson, spelling; James Everett, writing.

4th Class—Helen Kinlock, prize for good conduct, arithmetic, and geography; Alice Bruen, spelling; Mary Kemp, writing; Louisa Moore, good conduct; Ida Gibb, good conduct.

3rd Class—Mary Ann Cowan, prize for good conduct, arithmetic, and spelling; Arthur Dixon, geography; Mary Ann Cockburn, writing; Annie Elliott, good conduct; Edward Charters, regularity and punctuality.

2nd Class—James Lea, prize in arithmetic and geography; Anna Himes, reading; John Hunter, spelling; Jessie Turbayne, writing.

1st Class—Edwin Woodcock, prize in geography and spelling; Nathaniel McLeary, spelling.

JUNIOR DIVISION.

2nd Class—Elizabeth Hall, prize in reading; Annie Fowler, grammar; Matilda Bowie, arithmetic, geography, and history.

3rd Class—Sarah Tees, prize in reading, spelling, and history; Annie Muckle, drawing and arithmetic; Elizabeth Horne, writing; Sarah Kirkpatrick, geography and grammar.

4th Class—H. Heavysege, prize in drawing and history; Alicia Bryson, writing and grammar; Mary Knox, spelling and writing; Mary Kerr, reading; Ellen Anderson, arithmetic.

INTERMEDIATE DIVISION.

5th Class—Susan Wylie, prize in grammar; Charlotte Prentice, reading and spelling; Helen McDonald, writing.

6th Class—Elizabeth Cockburn, prize in reading, spelling, drawing, composition, arithmetic, and natural history; Fanny Martin, writing, geography, grammar, Canadian history, and general standing.

7th Class—Mary Logan, prize in composition, geography, grammar, and general standing; Agnes Cowan, spelling, writing, natural history, and Canadian history; Agnes Hunter, reading; Eliza Stevenson, arithmetic.

SENIOR DIVISION.

8th Class—Drawing and English Literature—Dora Gould.

9th Class—Writing, Drawing, Bookkeeping, and History—Harriet R. Varey.

Arithmetic, Geography, and general standing—Sophia Johnson. Reading, Derivatives, Composition, and general deportment—Joanna Craig Donald.

Grammar and general standing—Mary A. McLeod.

10th Class—Reading, Spelling, Geography, Composition, and English Literature—Ellen Cribb.

Arithmetic, Grammar, and English Literature—Lucy McLaughlin. Spelling, Writing, and general improvement—Margaret Thompson. Bookkeeping and general improvement—Mary J. Millen.

ADVANCED CLASS.

Prize in Synonyms, Latin, Geography, English Literature, Bookkeeping, and English History—Margaret Wilson.

Prize in Spelling, Algebra, Arithmetic, General History—Laura Sloane.

Prize in Writing, English Literature, and general standing—Annie Shepstone.

Prize in Reading, Drawing, French, Geometry, Grammar, Composition—Mary Jane Frazer.

Prize in Physiology, and general standing—Marion Brownlee.

BOYS' DEPARTMENT.

PRIZE LIST.—JUNIOR DIVISION.

Gandlack—Arithmetic, Geography, Grammar, Spelling.

Douglass—Grammar, Geography, Arithmetic, Good Conduct.

Robins—Arithmetic, Mental Arithmetic.

Thayer—Geography.

Simson—Reading, Writing, Drawing.

Ross—Geography, Mental Arithmetic, Credit Marks.

McBratney—Arithmetic, Dictation.

Dixon—Arithmetic, Geography.

INTERMEDIATE DIVISION.

Hibbard—Good Conduct, Arithmetic, Grammar.

Wilson—Reading, Spelling, Geography, Credit Marks.

Dezonche, G—Reading, History, and Credit Marks.

Fowler—Geography, History, Good Conduct.

McAdam, Ch—Drawing, Dictation, Writing.

Barlow—Grammar, Spelling.

SENIOR DIVISION.

Hull—Drawing, French, Grammar.

McAdam, Jas—French, Dictation, Good Conduct.

Tees—Grammar, Mental Arithmetic.

Neville, G—Writing, Arithmetic, Philosophy.

Carson—Writing, Drawing, Grammar, Philosophy.

McNab—Reading, French, Arithmetic, History.

ADVANCED CLASS.

McBride—French, Algebra, Geometry, Latin.

Fraser—Etymology, Composing, French.

Mattinson—Book-keeping, Drawing, Geometry.

Flanagan—Latin.

The following songs were sung by the pupils between the distribution of prizes:—"Happy meet we here." "Welcome, fine Morning." Verdi. "Star of the Twilight." Weber. "The Nightingale was singing." A. Lee. "When there's Love at Home."

Principal Dawson said: The prizes that had just been delivered, were given by way of encouraging those who had shown the greatest effort and exertion during the past year in the school. But it might happen after all that the recipients were not the most worthy. It might be that many a one in the school had studied harder, and worked more closely, and was better deserving than he or she who had really secured the prize. The school teacher could only judge by what he saw inside—out of school he was powerless to tell the many drawbacks which might stand in the way of the willing child. He (Principal Dawson,) therefore entreated his young friends to whom prizes had not been awarded, not to be unhappy or discouraged. And to those who had got prizes, he would say try and get something good as well, so that their learning and their talents might prove useful, and be a blessing to them. To the very little ones now present, he was glad to be able to congratulate them on their steadier and quieter conduct during the past year. He would give them a text which he hoped they would remember: "Evil communications corrupt good manners." He would make each of his little friends a present of a book himself, when they came back after vacation, if they remembered this text, and were able to tell him how they had profited by it. (Applause.) As to the girls, he would remind them that in addition to what they had got by learning things in school, they must strive to secure the education of the heart, of the feelings and the affections. (Applause.) They might look well, and dress well, and be considered as smart and very clever, and carry off ever so many prizes, but it would be a far better thing for them to have the heart's best affections trained within—feeling and practically believing that the best ornament they could put on was that of a meek and quiet spirit, which the Bible told us, in the sight of God was of great price. (Applause.) To the boys, young and old, he would say, manliness is not always bravery. Many a brave boy would meet a foe in the field, when he would shrink from the trouble of doing a hard day's lesson. He wished them to be strong in their determination to do right, strong in their earnestness—brave and bold as good boys growing up to be good men ought to be. (Applause.) To look at them just now—such a compact little phalanx—one would think the country had little to dread, even if the Fenians were to set upon them (laughter), but they had for all that to be taught, drilled and disciplined—learn to stand fast, and having done all to stand. This was the text he meant to give the boys to think upon. He would rather have them die where they were than to run away, if they were in the right. (Cheers.) To stand in the evil day was the conduct of a brave boy. Be brave then in school and out of it—in your classes and on the playground; stand out against evil influences and evil advice; consider yourselves not only gentlemen, but boys and Christians, and then you will never do a naughty deed, or think a naughty thought. In conclusion, Principal Dawson said he wished them all a happy vacation, and every enjoyment at home. (Applause.)

With the singing of the National Anthem, the proceedings were brought to a close.—*Montreal Transcript.*

Convocation of Bishop's College.

The annual meeting of the Corporation of Bishop's College took place in the College yesterday (27th June), at which were present the Metropolitan, the Bishop of Quebec; Hon. Edward Hale, D. C. L., Vice-Chancellor; Rev. J. H. Nicolls, D. D., the Principal; Henry H. Miles, D. D., Vice Principal; Rev. Mr. Irwing, M. A., the Rector; Rev. Mr. Dodwell; Mr. Rue; Major Campbell; B. T. Morris, Esq.; Rev. G. Slack, Rev. A. Lindsay, Rev. C. P. Reid, Hon. Mr. Sheppard, L. E. Morris, Geo. Moffatt, and Geo. Baker, Esqs.

The Hon. Edward Hale was appointed Chancellor, in the room of the late Mr. Justice McCord.

At the convocation of the members of the University, held in the evening, Strachan Bethune, Q. C., was elected Vice-Chancellor of the University. The Hon. Charles Dawey Day, Chancellor of McGill University, received the degree of D. C. L., and George Moffatt, Esq., M. A., *honoris causa*.

To-day a very large party assembled at the College to witness the conferring of degrees. The Chancellor, accompanied by the Bishops, the staff of the College, and about forty graduates, entered the large hall, and there conferred the following degrees:—On the Rev. Dr. Balch, of New York University, D. D.; Henry H. Mill, D. C. L.; Mr. Hubbard, M. A.; Rev. Henry Petry, M. A.; Mr. Mulvany, M. A.; Rev. Cannon Loosmore, M. A.; Rev. A. A. Allen, M. A.; Mr. E. Hale, jr., B. A.; Mr. Boyle, B. A.; Mr. Mayo, B. A.; Mr. King, B. A.; Mr. Smith, B. A.

Mr. Fraser and four other pupils of the school matriculated. Messrs. C. Rawson and Smith received scholarships.

Very eloquent addresses were made by the Chancellor, the Lord Bishop of Quebec, and Dr. Balch.

Mr. Mayo delivered the validictory address.

Immediately after convocation there were boat races on the Mississippi River, and in the evening a *conversazione*.—*Montreal Gazette*.

Educational Convention.—Teachers' Association of the District of St. Francis.

The semi-annual session of the Teachers' Association of the St. Francis District, E. T., was held in the Town Hall, Sherbrooke, on the 30th and 31st ult.

Among others present were the Hon. E. Hale, Hon. J. S. Sanborn, M. L. C.; John McConnell, Esq., ex-M. P. P.; Mayor Robertson, Sherbrooke; Rev. J. H. Nicolls, D. D., Bishop's College; the Rev. Messrs. Reid, Duff, Mallory, Evans, and Robinson; J. S. Walton, Esq., Sherbrooke *Gazette*; R. Freeman, Esq., Sherbrooke *Freeman*, and W. E. Jones, Esq., Richmond *Guardian*; Messrs. Jordan, Locke and Ewing, Teachers of Academies; H. Hubbard, Esq., Inspector of Common Schools; S. Hurd, Esq., Sec. Board of Examiners, quite a number of School Commissioners, and about fifty or so of male and female teachers of common schools.

A number of letters had been received from both lay and clerical gentlemen, expressing their sympathy with the objects of the meeting. The President of the Association, Principal Graham of Richmond College occupied the chair, and Prof. A. Duff acted as Secretary.

After the transaction of much important routine business, it was on motion of Mayor Robertson, seconded by Rev. C. P. Mallory, unanimously resolved, that a Committee consisting of the Hon. J. S. Sanborn, Messrs. Graham, Walton, Hurd, McConnell, Hale, Robertson, Jordan, Jones, and the Rev. Messrs. Reid, Mallory and Duff, be appointed to consider what amendments to the present School Law may be necessary, and make report to the Convention.

EVENING SESSION.

Notwithstanding the rain, the commodious Town Hall was nearly filled on the evening of Wednesday, to listen to an address by Principal Graham on the educational condition and claims of Lower Canada, and especially of the Townships. The lecture was taken down by two reporters, and will probably be given to the press.

At the morning session on Thursday Mayor Robertson on behalf of the Committee, reported the following resolutions, which were ably discussed in committee of the whole, and afterwards adopted by the Convention with almost entire unanimity:

Resolved I. That it is desirable that Education should be sustained by the common funds of the country, and be under one general system for the whole people, and that the system should be so framed that the rights of all parties should be guarded and protected.

II. In addition to the facilities afforded by the law to dissentients, it shall be provided that absentee proprietors of land in any municipality may, at their option, express their dissent from the majority in the same way as residents, and join any dissentient school, and the

local taxes on their property shall in such case be applied to the support of such dissentient schools.

III. Corporations may designate to which class of schools, dissentient or otherwise, their local taxes shall be applied.

IV. That in view of our mixed population, and difference of views between Protestants and Catholics upon the subject of school books, particularly such books as necessarily contain, directly or indirectly, moral and religious sentiments, it is inexpedient to confer power on the General Council of Public Instruction to decide what books shall be used in the Common Schools, leaving it to school commissioners, inspectors, and teachers to secure as much uniformity in the school books used as may be practicable.

V. That no priest, curé, or officiating clergyman shall have the right to prescribe what books shall be used in schools, and that part of the law conferring such powers be repealed.

VI. That the Council of Public Instruction should be composed of Roman Catholics and Protestants in equal proportions.

VII. That a committee consisting of the Hon. J. S. Sanborn, J. H. Pope, M. P. P., J. G. Robertson, Principal Graham, Principal Nicolls and C. C. Colby, Esq., do frame a scheme for the future support and conduct of the institutions for Superior Education in Lower Canada, with a view to some permanent arrangement to be embodied in a statute previous to the adoption of the contemplated political changes, and to report to a general meeting of the friends of education in the Eastern Townships, to be held at Sherbrooke, at as early a period as possible, to be called by said committee.

VIII. That Principal Graham, Hon. J. S. Sanborn, Mayor Robertson, and the Rev. Dr. Nicolls, be appointed a committee to wait upon the Hon. A. T. Galt, and lay before him the resolutions of the Association.

It is stated that these gentlemen had a lengthy and very satisfactory interview with the Hon. Minister of Finance, who was then in Sherbrooke.

The Convention adjourned to the call of the President at the time of the general educational meeting soon to be held. At this adjourned session much unfinished business is to be taken up besides acting upon the report of the committee on Superior Education.—*Id.*

Report of the Annual Meeting of the District of Bedford Teachers' Association.

"The Association met at the Academy in Waterloo, at 10½ A. M., on Friday, June 1st. President in the chair. The minutes of the last meeting were read and approved. The election of officers being next in order, the following gentlemen were nominated and elected for the ensuing year: President, J. W. Marsh; Vice-President, J. A. McLaughlin; Secretary-Treasurer, G. E. McIndoe; Executive Committee, H. Rose and J. P. Noyes.

"After the reading of some memoranda forwarded by a member of the St. Francis Association, and the appointment of a committee to examine specimens of Penmanship, the meeting was adjourned till 1½ P. M.

"The Association met as by adjournment. The President R. W. Laing, read an address which we give *verbatim* in another place, after which the following resolutions were discussed and passed:

"I. That this Association reiterates its conviction that the interests of Education would be greatly benefited if, in the constitution of Boards of Examiners and of the Council of Public Instruction, the just claims of professed teachers were acknowledged, and a just proportion of teachers were included in them.

"II. That in the opinion of this meeting the teacher may justly claim to be provided with certain conveniences for school work which are now often deficient, among which we would include a blackboard of suitable dimensions, a clock, a desk with lock and key, slates for those children whose parents are too poor to furnish them, and a terrestrial globe; and that it is the duty of the Commissioners to see that such articles are provided.

"Miss Merry, Teacher of the Ladies' Department of Waterloo Academy, then presented a very well arranged and thoughtful essay on "The Teacher's Work," urging upon teachers the importance of lofty aims and a high standard both of intellectual attainment and of moral character. A few remarks upon the subject of the essay were made by Dr. Parmelee, School Inspector.

"The Association then listened to an account of the meeting of the St. Francis District Association from Principal Graham, of St. Francis College, Secretary of that Association."

The committee appointed to examine specimens of Penmanship having reported:

"The Association then adjourned to meet at P. M.

"The Association met in the evening, but, as the attendance was small, little business was done. The following resolutions were however presented and passed:

"III. That it is desirable that the duties now belonging to School Commissioners be transferred to Municipal Councils.

"IV. That the law ought more explicitly to provide that Absentees and Corporations may designate to the support of which faith their school taxes shall be paid.

"V. That the School Inspector's duty should consist chiefly in awakening and informing the public mind on the subject of Education.

"The Association then adjourned to await the call of the President."

J. W. MARSH,
Secretary.

Waterloo Advertiser.

St. Francis College and Grammar School, Richmond, C. E.

Another very prosperous year of the above institution was closed by public exercises, in the College Lecture Room, on the evening of the 3rd inst.

On the dais were the Rt. Hon. Lord Aylmer, President of the College Corporation; Principal Graham, M. A.; Rev. Prof. Hubbert, Ph. D.; Prof. A. Duff, A. B.; C. A. Tanner, Prof. of French; the Rev. T. G. Smith, Rev. John M. Kay, Rev. D. C. Frink, A. M.; James Armstrong, Esq., Donald McLeay, Esq., and others.

The Declamations and other Exercises were spoken of at the close, by the Rt. Hon. President and others, as having been even beyond those of former years in excellence.

From the reports of the Principal and the several Professors, the following synopsis is taken:

There have been one hundred and twenty-three students and pupils in the College and Grammar School during the past year; forty-one of whom have boarded with the Principal, who resides in the College building. Twenty-nine of these students have been twenty years of age and upwards, and forty-eight have been eighteen years of age. Sixteen years have been the average age of the pupils in the Grammar School. Only a very few pupils are received below twelve.

Of the five students in the second year's studies in Arts, Hutchison, who last year secured the Hon. A. T. Galt Scholarship, was ranked first. Of the four in the first year, Robinson was first, and Cook third.

There were seven matriculants ranked as follows in Classics:—Morrison, Miller, and S. A. Abbott, first; Thompson, second; A. J. Abbott, W. Watters, and H. Hethrington, third; and in Mathematics, Miller, Watters, Morrison, and A. J. Abbott, first; and S. A. Abbott, second.

In Surveying, H. C. Cleveland, P. L. S. (Quebec Board of Examiners.) F. A. Cleveland, 3rd year, and F. C. Lawrence, 1st year.

Of students who had completed their general studies in this College, and who had during the past year finished their University professional course, were the three following:—J. H. Brownlow, M. D., Julius Leavitt, M. D., and E. R. Johnson, B. C. L.

Ten students had been engaged in teaching during the past year.

There are ample arrangements for the professional instruction of Students for Notaries Public or Provincial Land Surveyors, and also for the first year's reading in Medicine.

The students in the classes in Logic and Metaphysics presented the Rev. John McKay, their instructor, with a copy of the Library Edition of Worcester's Unabridged Dictionary, with an address of thanks for the able lectures given, without compensation, during the past session. Rev. Prof. Hubbert, A. M., Ph. D., Prof. of Natural Science, announced his offer of two prizes for the coming year, of ten dollars each, for the Best Botanical and Entomological collections, to be presented to the College; and also spoke of arrangements to give special practical attention to Mineralogy during the next session.

Prof. Duff, A. B., in making his report of the classes of Mathematics, addressed the students, commending much of their work, and giving some practical advice of the future.

The Alma Mater Society Lecturers during the past session were: Lord Aylmer, C. Dunkin, and W. H. Webb, M. P. P.'s.; the Rev. Messrs. Jeffrey, Gay, Duff, Frink and McKay; Profs. Hubert and Duff; Dr. Mackie, and Messrs. Dougall, Mackie, Wallace and Dickson, Esquires.

In the general report the following announcements were made:—The students, as is usual in this College, have enjoyed almost uninterrupted good health, and testimony of their good behaviour is borne by all acquainted with them. But one student had been dismissed for ill-conduct. The institution is non-denominational, and is now patron-

ized by all the Churches, Protestant and Catholic, the largest proportion being from the Church of England. Very great pains are taken with the religious training of the pupils,—regular attendance on Divine worship at their several Churches on the Sabbath, reading of Scriptures, praise and prayer twice a day in the family for all the residents, and Chapel Exercises daily for all the pupils. The Professors' and students' prayer meeting, one a week, is regularly maintained: most of the students are engaged in Sabbath Schools as teachers or pupils, and there is a Bible lesson of one hour every Monday, for all the students.

The Rev. Mr. Smith, (Church of Scot.) will take charge of the class in Moral Philosophy during the next session. There is a College Total Abstinence Society, of which many of the students are members. Very considerable pecuniary assistance had been received during the year from several benevolent gentlemen of means, in Montreal, by deserving students in straitened circumstances. Much good has been done in this way. The Galt perpetual Scholarship, (\$32,00) was obtained for the coming year by Mr. D. W. Morrison. Subscriptions and donations to aid in liquidating the College debt had been received as follows:—John Hethrington, Esq., \$100; Donald McLeay, Esq., \$100; T. S. Stuyver, Esq., \$50; Joseph Bedard, Esq., \$50; Thomas Mackie, Esq., \$50; and Messrs. Levine and Hirsh, \$50.

Donations to the Library and Cabinet had been received from several gentlemen.

Students were specially advised to finish, if at all practicable, their course in Arts before entering upon their Professional studies in Law, Medicine and Theology, and the hope was expressed that ere long the necessary requirements for entrance into those faculties would be considerably increased. The unfortunately large number of Medical and Law students graduated annually, calls for this. This College has now such a staff of Instructors as that its students can take a special course in English, French, Classics, Mathematics and Science, or a complete course in Arts. Should the increased number of students demand it, an additional Professor will be appointed.

The pupils in the Grammar School receive special instruction also from the several Professors. Commercial, and other branches preparatory for the different departments of business, have particular attention.

While this Institution of Learning receives the greater part of its patronage from the Eastern Townships, there are many students in attendance from all parts of Lower Canada, and some from the Upper Province. It now presents its claim for government recognition and support, equal to the Church of England College in the Townships.

At the close of the exercises short addresses were made by the Rt. Hon. President, and by the Rev. Messrs. McKay and Smith; a vote of thanks to the Principal and Professors was passed; the National Anthem was sung; and after the announcement that the summer vacation extended to the first Thursday in September, the Doxology was sung, and the Rev. T. G. Smith pronounced the Benediction. *Montreal Gazette—abridged.*

MONTHLY SUMMARY.

EDUCATIONAL INTELLIGENCE.

—The General Medical Council of Education and Registration, now sitting at the College of Physicians, have resolved that a certain minimum standard of preliminary education shall be required of youths desiring to enter the medical profession. The subjects of examination which they propose are as follows:—English language, including grammar and composition; Arithmetic, including vulgar and decimal fractions; Algebra, including simple equations; Geometry, first two books of Euclid, Latin, including translation and grammar; and one of the following optional subjects: Greek, French, German, and Natural Philosophy. After 1869, Greek is to be a compulsory subject. The three years of grace are allowed in order that schoolmasters throughout the United Kingdom, having thus much notice, may take measures to prepare youths intended for the medical profession with some knowledge of Greek. This last addition to the compulsory subjects of preliminary examination was proposed by Sir D. J. Corrigan, and was much discussed, but adopted by a decisive majority. Sir Dominic Corrigan mentioned the case of a student who, being asked the meaning of the word physiology, said that it was "a sort of fungus." A list of educational bodies whose certificates will be received, has been prepared. The Council are now engaged in considering the draft Bill for amending the Medical Act, 1858, as approved by the Home Secretary. It is anticipated that the effect of the regulations now approved, requiring a more stringent test of preliminary education, will be to improve the standard of students entering the profession, though at the

cost of diminishing their numbers. But it is possible that both results may be advantageous.—*Educational Times*.

—Though two weeks is not sufficient time to gain any adequate idea of the educational system of a kingdom like this, observation in a few places has impressed us with the fact that both the government and individuals are doing much for the education and enlightenment of the middle and lower classes. We gave some time, while in Liverpool, to a study of the educational institutions of that great commercial town, and were surprised to find that so much had been done in certain directions, to furnish the means for intellectual and moral culture.

There are in Liverpool about two hundred churches, some of them capable of holding two thousand persons each, and we saw two of them well filled on the Sabbath. There are numerous Sabbath schools and mission schools, especially in those parts of the town most needing these institutions. The Liverpool Institute, the building for which was erected by subscription at a cost of \$60,000, is one of the most flourishing institutions of the kind to be found anywhere. It comprises a boy's high school, a commercial school and a girl's school. There are also evening classes for those youth who are engaged in business during the day. In these schools, there are skillful and efficient teachers who are zealously engaged in their work.

Queen's College, which was inaugurated by Lord Brougham in 1857, is also connected with the institute, and this provides for a full collegiate course both in day and evening classes, and the members regularly receive their degrees. There is also a Government School of Design and Practical Art belonging to the Institute. This department has day and evening classes and a class for ladies. There are also corporation, national and infant schools, and a number of parish schools belonging to the different religious denominations. A part of these are regularly inspected by government and receive an annual stipend from the national treasury.

The public museums, libraries and galleries of art are also designed to be places for study and intellectual improvement, rather than amusement. The Derby Museum, containing the collection presented by the earl of Derby, has twenty rooms, some of them quite large, devoted to the exhibition of subjects relating to natural history, the fine arts and scientific inventions. Here are four bird rooms, three for mammalia, one for British animals, and various others, in which all the subjects are classified, named and arranged to facilitate study. Here is a specimen of all the grasses, of different kinds of cotton, flax, wool, rice, etc., described and the country from which each came, named. We noticed twenty-two varieties of cotton from America, twenty-six from India, and as presented in these show cases, the superiority of the American could be easily seen. All the various imports of Liverpool are represented with the country from which they came. The galleries of painting and sculpture are arranged to represent different schools of art and different styles of ancient and modern masters. The gallery of inventions and science includes models of steam engines—of marine appliances, of machinery, specimens of mathematical, astronomical and optical instruments, and the various applications of India rubber and other substances in the arts.

There is a large public library in the same building, fitted up with seats and desks to accommodate several hundred readers. Between twelve and one o'clock, we counted more than two hundred reading from books at the same time, a large majority apparently from the working classes. There are also other museums, libraries and reading rooms opened like these, entirely free to all, so that the poor as well as the rich can enjoy their privileges.

It is certainly a noble thing for the rich in a large town like Liverpool, thus to offer the means and opportunities of literary, scientific, and esthetic culture to all the inhabitants, as free as the water which is constantly flowing from its public fountains, in almost every street.

In Birmingham, which we selected as a good example of a large manufacturing town, we found a different class of educational institutions. There is first, the "King Edward's School," one of the old English endowed schools, in which five hundred and fifty boys are taught in a large, gloomy, castle-like, stone building. There are some eight or ten branch schools of a lower grade preparatory to this, and in addition, several parish schools belonging to different denominations. Some of these receive government aid. There is also a large free library here in a fine building. The appropriations for this were voted by the town in a public meeting.

The circulating library has now over ten thousand volumes, and eleven thousand volumes have already been secured for the reference library; among them are many rare and expensive works. The influence of these free libraries and reading rooms must be very beneficial on a population like that of Liverpool and Birmingham—and they help in some measure to supplement the education given in the schools.—*A correspondent in the Connecticut Common School Journal*.

—During four years, 6,000 public libraries have been founded and annexed to the French common schools, and the demand for books is said to double annually.

SCIENTIFIC INTELLIGENCE.

—Dr. Scheil says: "Ozone is oxygen in a highly electro-negative

condition, and air or oxygen ozonized by means of electricity, phosphorus, light, or any other method, may be combined with non-ozonized air or oxygen to form a galvanic circuit."

In support of the above theory, A. T. Hay, in the *Scientific American*, says:—I will present a few facts that have come under my own observation.

In dry, sultry weather, when there is the least amount of ozone present in the atmosphere, telegraph lines are frequently interrupted by the current coming in contact with non ozonized oxygen which forms independent or contra-galvanic circuits on the wire, rendering the transmission of messages very difficult or impossible for the time being. A thunder storm at such times always has the effect of destroying such contra circuits. Telegraph lines always work more or less imperfectly in hot weather, and particularly so where the lines are built parallel with large rivers on the low ground, where the least amount of ozone is present.

Ozone is destructive to malaria, and highly beneficial to health in times of cholera or other malarial epidemics.

In telegraph offices there is always the maximum amount of ozone, or highly electro-negative oxygen combining with the non-ozonized oxygen, and thereby rendering the atmosphere pure. During the prevalence of cholera in this country from 1849 to 1854, inclusive, I was connected with the telegraph lines in the States west of the Ohio river, and during that whole time I never knew an instance of a telegraph operator dying of, or even being attacked with, cholera; and in those days telegraph offices in the river towns were generally located in low grounds where cholera prevailed to the most alarming extent.—*Journal of Board of Arts, &c., U. C.*

—Mr Huggins prefers "granules" to other designations of the bodies which have been compared to "willow leaves," "rice grains," etc, because it assumes nothing as to their exact form or precise character. In parts of the sun free from disturbing currents, Mr Huggins finds these bodies look like rice grains under powers of about 100; but with greater magnification the apparent regularity of their size and shape disappears to a great extent. Many were round, but others are irregular, and they are as a rule, bounded by broken outlines. Could they be seen more closely, Mr. Huggins believes they would be as "wildly ragged" as our clouds. In size they are about 1" in diameter when round, and about 1" 5 when oval. Many were found less than 1", and some as much as 2" or 3". Mr Huggins gives, in *Monthly Notices*, a very curious sketch of the patterns formed by groups of these bodies. In one case three ovals are arranged in a long oval, a little constricted in the middle, the centre being occupied by other granules more thinly scattered. He supposes the granules to be "recently condensed incandescent clouds; that they slowly sink, merge into each other, become less and less luminous, and gradually dissipate into comparatively non-luminous gas." The dark pores, according to this theory, are spots where complete evaporation has taken place.—*Intellectual Observer*.

—Two small but very interesting specimens of the African elephant may now be seen in the Zoological Gardens, Regent's Park. The formation of their enormous ears is very striking. Nearly meeting at the back of the neck, and hanging down close to the shoulders, they look like a close-fitting cape through which the head protrudes. The animals appear very good-tempered, and are very willing to make friends with the visitors.—*Ibid*.

—Dr. C. B. Radcliffe describes, in the *Proceedings of the Royal Society*, his success in obtaining indications of statical electricity from living blood, nerve tissue, and muscular fibre, by the employment of gold leaf electroscopes.—*Ibid*.

—The power of the *Erythroxylon coca*, of Peru, to suspend the ordinary demand for food, and enable considerable exertion to be undertaken in its absence, has been long known. M. Rossi writes to the *Correspondenza Scientifica in Roma* a letter which, *Cosmos* says, undertakes to show how men may live in robust health for several days without food. M. Rossi describes his own experience, and it appears that, after taking a decoction of the leaves of the plant, no hunger nor thirst is felt for forty-eight hours.

—In a memoir read before the National Academy of Sciences, Professor H. A. Newton shows that the number of shooting-stars visible at any one time over the whole earth is 10,460 times the number visible at any one place. The whole number of meteoroids visible to the telescope, which enter the earth's atmosphere daily, he estimates at 400,000,000. The mean distance of the meteor parts varies between 140 and 232 kilometers. Professor Newton calculates that in the space which the earth traverses, there are as many as 13,000 small bodies in every volume of space the size of the earth; each of these, such as would furnish a shooting-star visible to the naked eye. If telescopic meteors be counted, this number would be increased at least forty-fold. The Professor does not regard these as the fragments of former worlds, but rather as the materials out of which worlds are forming.—*Educational Monthly*.

—It has been estimated that the ocean contains 160,000 cubic miles of magnesium, a quantity which would cover the entire surface of the globe, both sea and land, to a thickness of more than eight feet. In obtaining salt from sea-water, the residuum is largely magnesium. It

constitutes 13 per cent. of magnesian limestone, a rock found in all parts of the world in enormous quantities. Four years ago, all the chemists who had obtained it probably did not possess an ounce among them. Two years ago, its price was 112 guineas per pound. Now, owing to improvements recently introduced, magnesium wire is sold at three pence per foot. It has been suggested that when it becomes cheaper, vessels of war should be built of it; for while it is but little heavier than "heart of oak," it is as strong and tenacious as steel.—*Id.*

—Rev. Frederic Gardiner, by inserting a line of stakes in the ice across the Kennebec River, in the early part of February, found, in the middle of March, that there had been an expansion of the ice of over 12 feet in a breadth of 500 feet. As during this time the temperature of the water was nearly equal, the expansion must have been due to the sun's rays, which was proved by the fact that there was the least expansion on the eastern side, where the ice was partially shielded from the sun by a high bank.—*Id.*

—Pharaoh's Serpents have been succeeded by a new scientific sensation, *Zauber Photographien*, or Magic Photographs. These are sold in two envelopes: the first contains pieces of white albumenized paper; the other, slips of white blotting-paper of a corresponding size. One of the former is moistened with water, and a piece of paper from the other envelope, likewise wet, is laid thereon, when a beautiful photograph is instantly developed on its albumenized surface. Photographs have, of course, been printed in the usual manner on the albumenized slips, and then decolorized with bromic or iodic acid; the other pieces of paper have been soaked in hyposulphite of soda, and the application of this reducing agent to the hidden photograph brings it to view.—*Id.*

—A sea monster has been caught in Bateman's Bay, New South Wales. It resembles a huge turtle, having four large flippers. It is covered with a bony shield extending from one extremity to the other. The head and neck resemble those of a tortoise. It weighs 15 cwt., and is 13 feet long.

—Mr. Spiegelthal has made a curious discovery with respect to the great Syro-Assyrian monument called the pseudo-Sesostris. He has found on the margin of the brook, at Nymphæum, a little lower down the stream, a repetition of the colossal rock-cut sculpture, with the bow, lance, &c.

—An extraordinary reptile has just arrived from Queensland, in the shape of a monstrous specimen of the Saurian tribe, which, in the opinion of Australian savans, is more closely allied to the extinct reptilia of the pre-Adamite era than any living animal yet discovered. It inhabited the unexplored interior of Queensland, near the source of the Fitzroy river. The accounts related of the destruction caused by the monster upon the native population seemed perfectly incredible, until the formidable jaws, armed with fangs of astonishing size, were beheld. Added to this, its claws of prodigious power, and its invulnerable skin, rendered it most formidable. In the contest which ended in its destruction, one claw was torn off; but with this exception, the body is in perfect preservation.—*Educational Times.*

—A writer in the *Times* has drawn attention to the appearance of a new star in the constellation Corona. The star, however, is not new: the real phenomenon being the bursting into brightness of a faint star already known and catalogued. It attained its greatest lustre about the middle of the second week in May, and rapidly grew fainter; and passed beyond the limit of naked eye sight on Sunday the 20th, so that, unless it rekindles (which is improbable), it is useless to look for it without optical aid.—*Id.*

—We have received from Mr. Collins a beautifully-prepared slide of this curious parasite, *Trichina Spiralis*, which has recently occasioned so many deaths in Germany. The slide in question contains a thin and very small slice of pork, in which are a multitude of cells, with the worm-like *Trichina* coiled up in them. The history of this parasite will be found in Dr. Cobbold's *Entozou*. The practice of eating raw and partially-cooked pork is very favourable to the introduction of these creatures in the human organism.—*Exchange Paper.*

LITERARY INTELLIGENCE.

—The following are the ages of prominent English writers: Wilkie Collins, 42; John Rankin, 47; Charles Kingsley, 47; Tom Taylor, 49; W. H. Russell, 50; Anthony Trollope, 51; Charles Reade, 52; Robert Browning, 54; Charles Dickens, 54; Alfred Tennyson, 57; Archibald Alison, 66; Mark Lemour, 57; W. E. Gladstone, 56; Charles Lever, 59; Bulwer, 61; B. D'Israeli, 61; Barry Cornwall, 78; T. Carlyle, 70; Lord Brougham, 86.—*Illust. Teacher.*

—It is said that Milton's *Paradise Lost* and *Paradise Regained*, with illustrations by Doré, will be issued next autumn by a London publishing firm.

—The subject for the Arnold prize essay at Oxford, for the ensuing year, is "The Mahometan Power in India."

—Mr Collier has reprinted in his illustrations of Old English Literature "The Worthie Hysstorie of the Most Noble and Valiant Knight Placidus," a rare poem by John Partridge, of the early date of 1566.

—A late number of *Frank Leslie's Illustrated* contains a portrait of the late Francois-Xavier Garneau, and a biographical sketch from the pen of Mr. J. M. LeMoine.

NECROLOGICAL INTELLIGENCE.

—The Rev Francis Mahoney, known to literature as Father Prout, has just died at Paris. Born in Ireland about 1805, and educated in Jesuit College in France and the University of Rome, Mahoney was a Roman Catholic Irishman of the old school. He early took to literature, accepting an appointment on the staff of *Fraser's Magazine*, upon the invitation of Dr Maginn. A colleague of some of the brightest spirits in London, he was fully their equal in wit and humour—probably their superior in classical scholarship. "Father Prout's" essays in *Fraser* were eminently popular, and were published in a collected form in 1836. In 1860 they were republished, with etchings by Maclise. Mr. Mahoney also contributed some of the earliest and best papers which appeared in *Bentley's Miscellany* in 1837, and subsequently travelled for some years in Hungary, Asia Minor, Greece and Egypt. In 1847 he accepted from Mr Dickens the post of correspondent of the *Daily News* in Rome, and in 1840 published his letters, which were full of ardent zeal for the Italian cause, under the title of "Facts and Figures from Italy." He was for many years—indeed, until a month ago—Paris correspondent of the *London Globe*. Mr Mahoney had long lived in Paris, but occasionally he came to London, and his wit and scholarship, as well as the higher qualities of the heart, made him universally popular in the society which he frequented. He was a great master of languages—wrote French and Italian as well as English, and had Greek and Latin enough to bamboozle scholars by his pretended citations of fragments from the lost works of ancient authors.

—The Quebec *Morning Chronicle* announces the death of William Smith Sewell, Sheriff of the District of Quebec. The family to which deceased belonged is one of the noblest in colonial history. Connected with the rise and progress of British power on this continent, from the remotest times, unwavering loyalty to the British Crown, in weal and woe, has ever been the motto of the family. When the United Colonies severed the connection with Great Britain they removed to Canada, rather than forswear their allegiance. In Lower Canada they have always held a prominent position. The late Hon Chief Justice Sewell, father of the deceased Sheriff, was undoubtedly one of the ablest among the leading men who figured in the history of the past generation. Deceased had occupied the shrievalty of the district for very many years; and during the term of his service had ever distinguished himself by the quiet, unassuming, conscientious and attentive manner in which he discharged his duties.

MISCELLANEOUS INTELLIGENCE.

—The hospital records show the enormous aggregate of 253,000 Union soldiers to have died on battle-fields and in hospitals during the war, to suppress the Rebellion. This does not include those who died at their homes of lingering disease contracted in the service.

—A loving heart is the beginning of all knowledge. This it is that opens the whole mind, quickens every faculty of the intellect to do its fit work, that of *knowing*; and therefore, by sure consequence, of wisely uttering forth.

The courage we desire and prize is not the courage to die decently, but to live manfully. This, when by God's grace it has been given, lies deep in the soul; like genial heat, fosters all other virtues and gifts; without it they could not live.—*Carlyle*

—The adulteration of wines being so general, a mode of detecting any of the sophistications employed is a matter of some importance. In no way is even tolerably good wine more tampered with than in regard to its colour. It has been ascertained, however, that its artificial colouration may be very easily detected. For this purpose, a small piece of bread, or of sponge which has been well washed, is to be dipped into the suspected wine, and then placed in water. If the dark colour of the wine has been produced unfairly, the water will be, at once, tinted a red violet; otherwise not until after about half an hour.—*New Application of Chloroform.*—Both flour or meal, and the mineral substances ordinarily used to adulterate them, are completely insoluble in chloroform. This fact has suggested a very satisfactory mechanical test of the purity of farinaceous matters. A portion of the meal or flour that is to be examined having been placed in a tube which is closed at one end, the tube is to be nearly filled up with chloroform, and the open end, having been well closed with a cork, is to be agitated for a short time. All the farinaceous matter will be found collected on the surface of the chloroform; and the mineral matter, if any is present, will have subsided to the bottom. Should there have been an adulteration with mineral matter, it will thus be rendered distinctly perceptible.—*Intellectual Observer.*

—Dr B C Wilder, late surgeon of the Fifty-fifth regiment Massachusetts volunteers (colored) gave the first of four lectures upon the *Silk Spider of South Carolina*, in Boston, Tuesday evening. The journal gives the following brief but interesting synopsis:

The first of this species of spider was discovered by the lecturer, on the north side of Polly Island, while in camp there in August, 1863. He wound from its body, in one hour and a quarter, one hundred and fifty yards of yellow silk. The next year another officer wound from thirty spiders three thousand four hundred and eighty four yards, or nearly two miles of the silk. A single thread of this was strong enough to sustain a weight of from forty-four to one hundred and seven grains. In 1865, Dr Wilder showed his specimen to Prof Aggasiz and others to whom the species was new. Returning to Charleston, he resumed his researches, and after a variety of adventures and disappointments, succeeded in getting a number of the spiders.

In the course of the season these all died from lack of knowledge as their habits, mode of living, &c. From the eggs deposited, however, many others were produced. It is the habit of the stronger to devour the weaker, so that out of several thousand only a few hundred were raised. The fact, however, was clearly demonstrated that they could be raised and live through a Northern winter. In the succeeding lectures the method of securing the silk, and other facts in regard to this interesting discovery will be given.

Specimens of the silk were exhibited, which were of a golden yellow and a silver white, and as brilliant as the metals in appearance. It is elastic, while the silver colored thread is non elastic, and is used for the main stays of the web. Dr Wilder has a lot of these spiders living in the Cambridge Conservatory, and many young broods in his room in Boston. The Doctor has made full communications to the American Academy, and to the Boston Society of Natural History.—*Hunt's Merchants Magazine*.

—A person may be saved from drowning by the proper use of a man's hat and a pocket handkerchief, which (being all the apparatus necessary) is to be used thus: Spread the handkerchief on the ground, and place a hat with brim downward, on the middle of the handkerchief, and then tie the handkerchief round the hat as you would tie up a bundle, keeping the knots as near the centre of the crown as may be. Now, by seizing the knots in one hand and keeping the opening of the hat upward, a person, without knowing how to swim, may fearlessly plunge into the water with what may be necessary to save the life of a fellow-creature. If a person should fall out of a boat, or the boat upset by going foul of a cable, or should he fall off the quays, or indeed fall into water from which he could not extricate himself, but must wait some little time for assistance, had he presence of mind to whip off his hat and hold it by the brim, placing his fingers within-side the crown, and hold it so (top downward), he would be able by this method to keep his mouth well above water till assistance should reach him. It often happens that danger is described long before we are in the peril, and time enough to prepare the above method; and a courageous person would, in seven instances out of ten, apply them with success.—*Land and Water*.

—A negro has formally petitioned the Probate court, of Tallahatchie country, Alabama, to be allowed to sell himself into slavery. He says there are too many responsibilities surrounding him, and that he is dissatisfied with his present condition.

—A letter has been received from M. de Baer, of St. Petersburg, announcing the most interesting fact that a mammoth has been found in Arctic Siberia, covered with his skin and hair. The animal must have been literally kept packed in Arctic ice from one epoch to another. The discovery had been made so early as 1864 by a Sanyede in the environs of Taz Bay, the eastern branch of the Gulf of Obi. The news reached St. Petersburg at the close of 1865. With culpable slowness the Academy of St. Petersburg has only just sent the distinguished paleontologist, M Schmidt, to investigate the matter, and especially to examine the contents of the stomach in order to discover what was the animal's natural food.—*N. Y. Teacher*.

—The principal members of the new Cabinet have already served in previous ministries. We take the following particulars respecting them from Dodd's Parliamentary Companion and other sources:

Earl Derby, the Premier and leader of the Government in the House of Lords, was born in 1799. He has been Chief Secretary for Ireland, Colonial Secretary, and twice (now three) Premier.

Mr. Disraeli, the Chancellor of the Exchequer, is now 67 years old, and first entered Parliament in 1837, in which he has always had a seat ever since. He was Chancellor of the Exchequer under Lord Derby from March till December 1852, and again from March 1858 to June 1859.

Lord Stanley, the new Foreign Secretary, is the eldest son of the Earl of Derby, and represents Lynn-Regis in the House; and notwithstanding his comparatively tender age (40), has already occupied places of considerable trust in the Cabinet. In 1852 he was made Secretary for Foreign Affairs and Colonial Secretary; in the short-lived Derby government of 1858, President of the Board of Control, and Secretary for India. He is one of the hardest working and most promising men in the House,

and when the crisis recently occurred was unanimously selected by public opinion for the responsible post now conferred upon him.

The Right Hon. Spencer Horatio Walpole, Sir Charles Grey's successor in the Home Office, is M. P. for Cambridge University, and exactly 60 years old. He is a Q. C., and was Home Secretary in the Derby Ministry of 1852 and 1858-59, resigning in the latter year in consequence of his dissatisfaction with the Reform Bill brought down by his leader.

Gen Peel, the new Secretary of War, was a member of the Cabinet, as War Minister, in 1858-59, and has been in Parliament for Norwich and Huntingdon since 1826. He entered the army in 1815, and was created a Lieut.-General in 1854.

Sir John Pakington, the new First Lord of the Admiralty, is as old as Lord Derby, having been born in the same year, and has sat for Droitwich ever since 1837. He was Colonial Secretary under his present leader in 1852, and First Lord of the Admiralty from 1857 till June, 1859.

Sir Stafford Henry Northcote, M. P., for Stamford, the new President of the Board of Trade, was at one time Private Secretary to Mr. Gladstone, when he too was President of the Board of Trade, and Financial Secretary to the Treasury—a minor post under Lord Derby's Government in 1858-9. He is a lawyer by profession.

The new President of the Council, the Duke of Buckingham and Chandos, is better known in America as the Marquis of Chandos. He was born in 1823, and has been a Lord of the Treasury, and Keeper of the Privy Seal to the Prince of Wales. He is one of the most popular noblemen in Great Britain, having several years ago relinquished all title to the family estates for the purpose of paying his late father's enormous debts, a sacrifice which he could easily have avoided under the law of entail, had he been so disposed. The despatches received do not state who is to be Colonial Secretary. It will probably be Lord Cranborne.

ADVERTISEMENTS.

McGILL UNIVERSITY, MONTREAL.

The Annual Calendar for the Session of 1866-7 is now published, and contains full information respecting

THE FACULTY of LAW.
THE FACULTY of MEDICINE.
THE FACULTY of ARTS.
THE MCGILL NORMAL SCHOOL.
THE HIGH SCHOOL of MCGILL COLLEGE.
THE SPECIAL COURSES.

Copies of the Calendar may be obtained gratis, on application, post-paid, to the undersigned.

W. C. BAYNES, B. A.
Secy. Royal Institution.

McGILL NORMAL SCHOOL, MONTREAL.

The tenth session of the School will commence on the third September, 1866, and extend to the first of July, 1867.

Candidates for admission into the Junior Class will be required to pass an examination in Reading, Writing, the Elements of Grammar, Arithmetic and Geography.

All Students must produce certificates of good moral character, and that they have attained the age of sixteen years. They will also be required to sign a pledge that they purpose to teach for three years in some public school in Lower Canada.

At the close of the first year of study, students may apply for examination for diplomas giving the right to teach in Elementary Schools; and after two years' study, or if found qualified at the close of the first year, they will, on examination, be entitled to diplomas as teachers of Model Schools.

Students having passed the examination in the Model School Class, or having advanced to the requisite knowledge, may go on to the Academy Class, and, on examination, may obtain the Academy Diploma.

On passing the examination, Students not resident in Montreal will be entitled to bursaries in aid of their Board; and if resident more than ninety miles from Montreal, to an allowance for travelling expenses.

Tuition and use of Text-Books free.

The printed announcement of the School, and all other information, may be obtained on application to the undersigned.

W. C. BAYNES, B. A.