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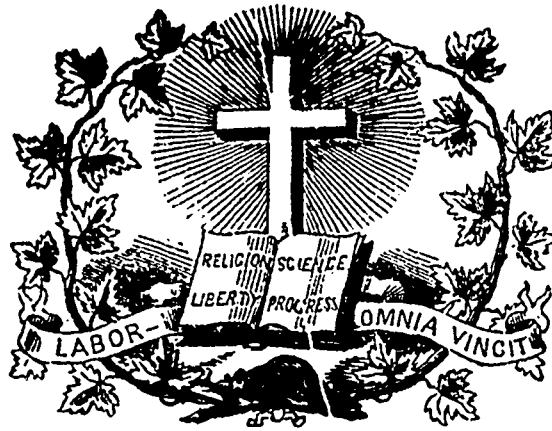
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# JOURNAL OF EDUCATION.

Volume VI.

Montreal (Lower Canada) November, 1862.

No. 11.

**SUMMARY.**—**EDUCATION:** Physical and military exercises in public schools. by Edward L. Molmeux, (continued.)—Graduation in teaching and training, by John Bruce, Esq., Inspector of Schools, (continued.)—Sympathy with children.—Penmanship.—**SCIENCE:** Cosmogony and Geology, an introductory lecture to a course of Natural History, by Mr. Denton.—**LITERATURE:** Poetry: The Cross.—Husband and wife, by Mrs. Leprohon.—**OFFICIAL NOTICES:** Appointments: Examiners.—School Commissioners.—School Trustees.—Erections, divisions, &c., of School Municipalities.—Diplomas granted by Boards of Examiners.—Situations wanted.—Donations to the Library of the Education Department.—**EDITORIAL:** Boards of Examiners.—Inauguration of Morrin College at Quebec.—Extracts from Reports of School Inspectors, (continued.)—**NOTICES OF BOOKS AND PUBLICATIONS:** North America, by Anthony Trollope.—The Magdalen Islands, by Revd. G. Sutherland.—Géographie Moderne, by Mr. Holmes.—Éléments de géographie.—Traité d'arithmétique, by Jean Bouthillier.—Transactions of the Literary and Historical Society of Quebec.—Les éléments de l'agriculture, by James Smith.—**MONTHLY SUMMARY:** Educational Intelligence.—Literary Intelligence.—Scientific Intelligence.

## EDUCATION.

### Physical and Military Exercises in Public Schools.

(Continued from our last.)

Nor has the training of a better class of seamen been neglected. This is of vital importance to the well-being of a commercial people, and it is well for us to see what steps England is taking in the matter.

“For the purpose of giving instruction in the naval drill, old masts and tackle have been obtained for some of the training schools in England, and Mr. Taffnell has received expressions of satisfaction from naval men of the way in which some of the boys have by these means been tutored as seamen in pauper schools. In order to form sailors, it is necessary to have masts and sails rigged in the playground, and a regular seaman must be engaged to drill the boys.

Mr. Baker has observed that the naval drill as given at Greenwich, is highly effective. “He states that he was on board the Ganges and the Conway at a time when many boys came on board who had been taught the naval drill at Greenwich naval schools; and that they proved to be as ready and well trained as man-of-war’s men; they were clear and orderly, and as a class were first-rate seamen, becoming petty and warrant officers in greater proportion than others.”

Of its consequence upon the national health and industry, “Professor Owen has stated that even in the best-warmed and ventilated schools, five or six hours’ enforced stillness of growing children is a violation of the primary laws of physiology; whilst Miss Nightingale and others agree that, under the present system, children are placed under conditions which impair good bodily health and generate epidemic disease. Mr. Rahmsen, a school commissioner at Amsterdam, states that the physical evils attendant upon the present

amount of sedentary confinement in schools, required from young children, is beginning to attract attention in Holland, and that they have under trial a system of exercises for schools advocated by Dr. Schrieber, of Leipsic. ‘The chief question,’ says the latter gentleman, ‘is, How are our children to be brought up? Is it according to the laws of nature? The answer is, No; or we should not see so many children who were rosy and healthy before going to school, become pale and bloodless after school has begun;’ and he prescribes the limitation of the hours of school confinement.

Mr. Robert Rawlinson, civil engineer, gives the following as his opinion of the advantages of school drill in connexion with manual labor:

“In my opinion, based on experience and observation, I think school drilling and training would prove of the utmost consequence to the boys in after life. I may give a few instances. In all engineering and building, tradesmen are frequently required to use their strength in concert, lifting, carrying and drawing; men, to use their joint strength not only effectively but safely, must have confidence in each other. Two trained men will lift and carry more easily and safely than four untrained men. I have frequently seen trained men weed out unskilled men where heavy lifting has been required, because they dare not risk the danger arising from unskilled strength, and few have performed with more safety work which would have been lighter and easier if all had been equally skilled. Men frequently reject the assistance of unskilled men, as there is absolutely danger in having them near. Frequent accidents arise from using men unskilled in lifting, in hoisting, and at capstan work. . . . Boys should not only learn to march, but to lift, carry and pull in concert. There are many necessary feats of strength in all trades, which are more matters of knack and tact than of brute strength. Brute strength frequently fails to do that which comparative weakness can accomplish easily with skill and confident concert. There is no regular system of training in concert to use human strength in the best manner in any trade, so far as I know; acting in concert is a matter of necessity, and practice gives facility and confidence. Drill and training would probably double the effective human power of any establishment, especially if numbers are instructed in joint feats of strength. That which is taught to youth is never forgotten in after life.”

“As regards its fitness as an appendage to the highest branches of education, we have the testimony of experienced examiners at the University of Oxford, England, who state that six hours mental work, instead of ten or twelve, for adults, was the time of the great majority of the prizemen; and it was always found that those who were the foremost in mental labor were commonly the foremost in boat-rowing and physical exercise. The Vice-Chancellor of Oxford testifies that the institution of the systematized exercise of the volunteer drill in that college had been attended by an improvement of the mental labors, and of the whole of the order and discipline, as well as of the health of the University; and that, encouraged by these results, he was considering of making provision for cavalry exercises.”

Mr. Chadwick has also furnished incontestable proofs of the absolute necessity of more active physical training for females and of its bearing upon the future welfare of the race. But this subject has been rendered so familiar to American readers by the able pen of Miss Catherine E. Beecher, that we need not touch upon the European view, except to say that the noble labors of Professors Ling and Branting, of Sweden, have been ably seconded by very many of the governments of Northern Europe, where a method of gymnastics for females, has been systematized and practically adopted. From this brief sketch of the practical working of physical military exercises in Europe, let us turn to what has been accomplished among our own countrymen, whose activity in behalf of public education called forth the compliment from Prof. LeRoy, which we wish was better deserved, especially by the class which he specifies, that "the improvement of schools is, so to speak, the fixed idea, the constant preoccupation of the statesmen of America."

We have indeed a noble and liberal system of education, but we would see its fostering care so extended as to invigorate the bodies as well as develop the mental faculties and intellectual powers of the pupils. The military exercises would best accomplish this, and at the same time form our public schools into a NURSERY FOR A BRAVE AND EFFECTIVE MILITIA.

Early in October last a communication was addressed by the writer to the different governors, and various other persons connected with the executive departments of the Northern States, in regard to the advantages to be derived from the introduction of infantry drills in the public schools, and by early preparation in school-days to strengthen the militia of the different States. At the same time it was placed before the New York and other City Boards of Education, and referred by them to special committees. The subject was also agitated through the columns of the daily press. The warm responses which have been accorded to these communications, prove the deep interest which is felt in this important matter, and it is to be hoped by the time this article appears in print, some legislative action will have been taken.

In New York, the energetic Judge Advocate General William H. Anthon, being engaged in a report upon the militia laws, and taking a warm interest in all matters relative to the efficacy of the militia, thus speaks of the importance of some alteration in the present system, in a letter addressed to Mr. Curtis, President of the Board of Education in the city of New York:

"The entire system, in my judgment, needs revision and reform, in order to make the militia what the Father of the Republic intended it should be.

It has been suggested by several persons, and among others Col. Richard Delafield, U. S. A., and Maj. E. L. Molineux, that an excellent foundation for an improved militia system would be the introduction of 'The Manual of Arms,' and 'The School of the Soldier and of the Company,' into our public schools.

I am disposed to consider these suggestions as valuable, and shall feel obliged to you if you will, as early as may be convenient, inform me how far you deem them practicable, and how they may be most conveniently introduced into the institutions under the charge of your Board."

Mr. Curtis, whose personal observations on the European school systems, and whose long experience at the head of the Educational Board of the largest city in the Union, renders his views of the greatest value, replied:

"It has been my opinion for years that military instruction should, under certain restrictions, and to a certain extent, be given to the older boys in all the schools and institutions that are supported or draw funds from the public treasury. It is but just to the State whose munificence sustains these schools, that the pupils should be instructed in those branches of knowledge that will make them useful and effective in defending and protecting the State. A well organized militia, receiving from year to year into its ranks the disciplined and instructed youth who have passed through the public schools, and to whom the duties of the soldier are familiar, will always be sustained by the public confidence and esteem."

Military discipline and exercises are by no means an untried experiment in the annals of American education; some of our best private schools and institutes having long since adopted it, and with a good degree of success as it will be our endeavor now to show.

To the admirable regulations of our National Military and Naval Academies, we need not refer; the systematic course pursued by them for the development of health, for discipline of mind and body, being well known to the majority of our readers.

One instance which came under the writer's personal observation, will sufficiently illustrate the dependence which can be placed upon well-drilled boys in case of emergency.

In April last, when Washington was defenceless, Baltimore in riot, and all Maryland in a state of revolt, communication being cut off at Annapolis, there was great fear of attack upon that important strategic point. The pupils were prepared for any exigency, and slept with their loaded rifles over their cots. At an alarm of a night attack, there was no hesitation among those gallant little fellows. They were up directly; fell in their ranks and off at a double-quick for the point of danger, in an almost incredible short space of time. The elder boys dragged their howitzer with them. Had an attack taken place, those pupils would have given a good account of themselves and have stood their ground with courage and steadiness. The secret of this is the discipline, for which they are indebted to the assiduity of their brave and experienced superintendent, Captain Blake of the Navy.

Let us read the opinion of this able officer in respect to the applying of this discipline to public schools:

"My experience at this institution long since impressed me with the importance of this subject, and I intended to have given my views publicly, but you have left nothing more to be said upon it, and I can only hope that those who have the control of our public schools will view the subject as we do. We have received about a hundred and forty acting midshipmen this year, some of them very young, and although they have not been here two months, they present a beautiful example of such results as the system would produce all over the country."

It must be acknowledged that the States now in rebellion have devoted much more attention to military instruction in special schools, than we have, many of them pursuing the European plan of State Academies devoted to military science. Thus while we have been obliged to create officers from the small nucleus afforded us from West Point, they have had the students from State Colleges to officer their regiments.

For a long time back Virginia has annually expended upon her Military Institute nearly \$50,000; South Carolina, \$30,000; Kentucky and other States have likewise institutions, founded in whole or part, upon a military basis.

Although several attempts have been made to obtain legislative action for similar institutes in the Northern States, they have not, up to the present time, been successful, owing, we think, to the groundless opinion that it would prove a heavy tax, without a corresponding advantage. We shall endeavor to prove in this article how economically an academy could be supported. It is, therefore, to private enterprise, we are indebted for any experiments which have been made in this respect.

Several of our best boys' boarding-schools in this portion of the country, have for a long time employed a military instructor for the pupils and been managed on a semi-military organization; they have been well sustained by the patronage of the public. We instance two or three schools of the present time.

Dr. Russell's Collegiate and Commercial Institute of New Haven, is one which has already been of national advantage to us, for according to Prof. Daniel C. Gilman, "the scholars were of great service in drilling the recruits of Connecticut at the outset of the war, and many of them now hold important posts in the army. The scholars were formerly trained as infantry and are now at artillery practice." Mr. Gilman very justly observes, that in a country like ours with no standing army, every able-bodied man should learn to bear arms, and there can be no cheaper or efficient way of doing this than by teaching boys in schools.

The Eagleswood Collegiate and Military School, near Perth Amboy, N. J., has been recently organized on the military plan. The scholars are formed into a battalion under a superintendent and colonel commanding, the rest of the officers being taken from the scholars. The State of New Jersey has supplied the institute with arms, and the military regulations apply to the conduct of the pupils in their general department. The reasons given for employing this discipline are the same that apply in every instance, that it is the most orderly and effective, increases the energy, vigor and manly attitude of the boys, and induces cheerful obedience.

To Major J. P. Prall, Military Instructor, we are under obligations for the following account of Mr. Tracy's Military Boarding School, at Turrytown, N. Y.:

"There is no question, in my mind, of the utility of military instruction in schools, and if I had any doubts, they would speedily be removed by the fact that the very exigency you propose to provide for is being developed, only in a less degree, in the volunteer army now fighting our country's battles. There are a number holding honorable positions in the army of the Potomac, and elsewhere, who have more particularly come under my own observation, that have passed through a course of similar instruction to what you propose, in private military boarding schools, who give

evidence of superior knowledge as soldiers, and with a little preparation were *ready* to assume the duties and responsibilities of the field and camp. They have more particularly distinguished themselves as drill masters and thorough disciplinarians, the very ground you proposed to cover in your articles in the N. Y. Tribune of Nov. 20. I have especially noticed, of late, the facility with which youth acquire military knowledge since the outbreak of the rebellion, when the occasion seems to impress them more strongly with its importance.

Independent of the military availability of youth thus instructed, the promptness and precision that the system induces is apparent. A simple sketch of the routine of duties in a school over the military department of which I have the supervision, may give an idea of its utility, as well as its usefulness. This department is conducted in such a way as to make the military feature an auxiliary to the classical and preparatory. Part of two days in each week is more especially devoted to military drill and instruction, when the flag is raised on the flag-staff on the parade ground with the roll of the drum, and the sunrise gun is fired. At sunset it is lowered with the same ceremony by a file of boys, in charge of an officer, or non-commissioned officer. On other days of the week a drill of about an hour is held, in command of the company officers,—always in presence of the Principal. The utmost strictness is required in all the military features. The "Assembly," when beaten for drill or parade, occupies one minute—*immediately* after, "*fall in*" is given by the orderly, when *entire* silence is required. Boys being naturally playful, much more care in these particulars is necessary than in grown persons. *Tattoo* begins at 9 o'clock precisely, when the minute of its duration expires every cadet is required to be in line for "roll call," and the three squads, each in charge of an officer, are marched by flank to their quarters, (the whole not occupying more than two minutes.) They halt opposite their beds, and salute their officer as he passes out;—in five minutes the lights are extinguished. Their clothing is uniformly arranged, and in such way that if called up at night they can dress without lights and without loss of time. The officer in command of each, being held responsible for the condition of his squad. The military instructor inspects at unexpected times, and directs the chiefs of squads to report the result to the officer of the day, through whom all reports to the Principal must be made at 9 o'clock A. M. each day. *Reveille* at day break, and they march by squads to wash room, where twenty minutes is allowed for necessary ablutions, blacking boots, &c., and then the march to the Assembly-room for "*roll call*." Inspection of boots twice a week, at unknown times.

The squads for the *mess-room* march in order, filing each side of the tables, face inward, and "*sit down*" by command; *rise*, march out and *break ranks*, observing the same military precision. These various duties are performed with pleasure and pride by the cadets, and the same promptness and regularity is apparent in every movement.

The *armory* and arms are in charge of a detail of four, and are inspected in turn on the roll, each week, and reports are made of disabled pieces, and the general condition of the arms and armory, to the officer of the day, and through him to the Principal. The various reports are embodied into one, by this officer, so that the Principal is not burdened with the details unless he calls for them.

Orders are issued from time to time, by the Military Instructor, and engrossed in a book, which is open for inspection of visitors, announcing promotions, results of inspection, and noting cases of military merit and demerit, &c. This has a tendency to stimulate to exertion, and to efforts to avoid unfavorable notice.

Military classes 1st, 2d and 3d, graduated according to military merit are established, and promotions to them made after strict examinations. All company officers are selected from the 1st class.

A class of Honor, consisting of members of the First class who have escaped being reported for disobedience and improper conduct, is also formed. A given number of military demerits reduces a cadet, and the badge which is worn on the left breast is taken from him. He may, however, be reinstated.

Military demerits are punished by military penalties.

Cadets are taught to observe the position of the soldier when on duty also; the benefit of this is very marked. When the machinery is properly set in motion, the labor generally attending the minutiae of school duties is greatly reduced, and much more pleasantly and thoroughly performed.

I have not entered into all the details, (and have given the military only) but enough to give a general idea of the plan adopted by the school. There are different modes in use in other schools. Some partaking more of the military, and some less. I think there is danger, often, of *too much* military being engrafted so as

to make it burdensome; great care should be taken in this particular, as the cadet wearies of it when the novelty is past."

Mr. N. W. Taylor Root, in his admirable book on School Amusements, furnishes practical testimony "that it fosters habits of promptness, exactness, and unanimity of action; teaches implicit obedience to commands, erectness of carriage, a neat and clean appearance, and a gentlemanly and respectful behavior."

It will thus be seen that a system of military drill has been tested morally and physically, in private schools, and found of decided advantage.

Why should these benefits be denied to the pupils of Public Day Schools?

Why should this vast defensive power be lost to the Government?

As a national military necessity; as a protection to the health and constitutional vigor of American youth; and as a powerful agent upon their moral behavior, their energy, self-reliance and spirit of enterprise, let Physical Training be engrafted on the course of studies for all the pupils educated at the expense of the State. Let us not hesitate at the magnitude of the undertaking, for it is a *necessity*, and under proper regulations and restrictions can be successfully and economically accomplished.

The greatest difficulty to be surmounted is the successful working of a system at once applicable to the requirements of a small district school, with a limited number of scholars, attending only at certain seasons of the year, and of those of the larger cities, with numerous schools, in which a great number are under instruction.

Let us commence at the foundation, in the Primary Schools.

The moment the child enters the school care should be taken that the mental exercises which are given should be relieved by frequent intermissions for running and playing, under the supervision of the teacher. Thus we are glad to say is the case in very many of our best primary schools; but it is when the child becomes more advanced, when there are lessons to commit to memory at home, that some simple physical exercises should be taught him every day; exercises calculated to develop the growth and expand the muscles. The calisthenics recommended in Miss Beecher's work are excellent, simple, and easily fitted to the limits of the school house. The report of Mr. W. H. Wells, Superintendent of Public Schools for Chicago, for 1860, gives some interesting particulars of simple exercises which have been attempted in that city.

There would be but little difficulty experienced in selecting movements and gymnastics suitable for the strength and ability of the classes of younger boys and girls under instruction, provided the method was established as an imperative duty which *must* be regularly put in practice, and that no lack of interest on the part of teachers, or laziness of the pupils would be accepted as an excuse for non-compliance with the regulation. We trust if Physical Training is carried out in our system of education, that a carefully prepared Manual of all kinds of exercises, embracing the military drill, will be compiled for the use of schools; in a word, a text-book to which our teachers can turn with confidence to find exercises suitable for all classes of pupils.

From the Girls and Primary, we pass to the Boys Grammar departments, for which we propose military exercises, as being the most economical and advantageous for public schools; for *tactics* manœuvre large bodies in a small space, in an orderly manner, whereas gymnasiums are too expensive, and can not be made large enough to accommodate many scholars at once. This opens to us our most difficult, but at the same time most useful, field for prompt and energetic action.

Suppose we take for an example one of our large cities. The lower and female departments having simple physical exercises in use, it is wished to introduce military exercises into the grammar schools. Let us see how simply it can be organized, and how far it is possible to extend these studies if desired.

The following interesting letter from the Mayor of Bangor, will show the movement in that city, an example well worthy of being imitated.

CITY OF BANGOR,  
Mayor's Office, Dec. 21st, 1861. }

DEAR SIR:—In reply to yours of the 19th inst., I would say that, upon my recommendation, through a communication I made to our City Council, on the first Monday of the present month, an Order was passed directing the military drill to be introduced into a portion of the Public Schools of this city.

I had given the subject some thought and investigation, and was prepared to recommend the adoption of the drill for the physical training, no less than for the military instruction it might impart. The prevalent idea that education consists in training the intellect only, is gradually becoming superseded by the more rational theo-

ry that true education consists in training the moral and physical, no less than the intellectual faculties.

*Barnard's American Journal of Education.*

(To be continued.)

### Graduation in Teaching and Training.

By J. BUTCS, Inspector of Schools

(Continued.)

Before proceeding to illustrate the rising and falling movements of the voice by rules and examples, I present the teacher with the following diagram, which is intended to represent the different degrees of slides;—requesting its careful study, and to exercise himself upon the different intervals of slides till he can readily make his voice rise or fall from the fundamental pitch of his voice, whatever that may be, to any degree he pleases. Till then he cannot be considered well qualified to instruct his pupils in voice modulations.

N. B.—I do not consider it necessary to go beyond the octave ranges of the voice; not that the voice in an upward and down-

tinued till he shall have acquired that command over them, which will enable him to give any quantity of sound required in their syllabic or word-combination. And the same exercise should extend to words in composition. It is composition that gives words their relative totality of meaning, and their relative degrees of tones, and tones their special characteristics.

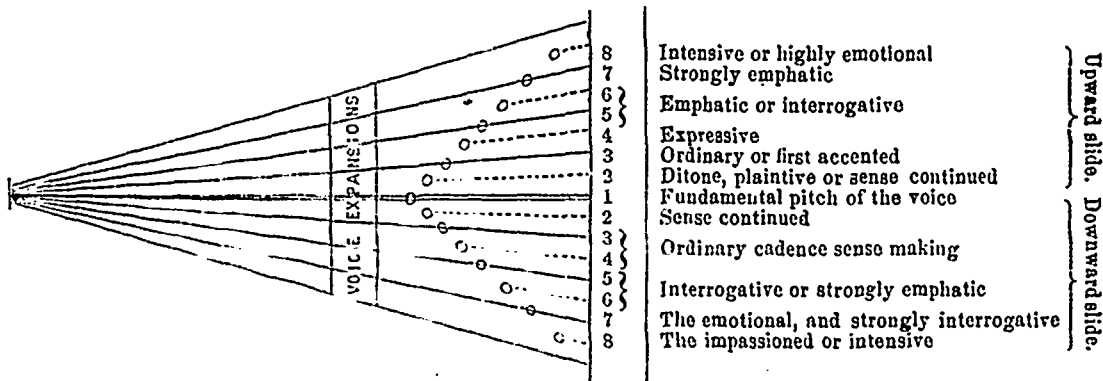
9. With this exercise, combine the practice of *force of voice* through its different gradations, till a full command, from a distinct whisper upwards to our highest tones, is acquired; and let the difference between ascending and descending intervals, and *properly sliding tones* be pointed out. By the former, the voice passes up or down by steps,—those *not linked* by continued vocalization; by the latter, it flows up or down by an unbroken sliding of the voice.

A little practice will clearly show these differences.

10. Observe, there are *three scales of pitch*, viz. the *continuous rise and fall of the voice*; the *step rising and falling*, whether the intervals be tones or semitones; and the *tremulous*, or those momentary impulses, separated from each other by very minute intervals, having an upward or downward tendency of vocality.

11. In the *ordinary use of the voice* the continuous rise or fall goes through the interval of a tone, a third, or a fifth.

Diagram, showing the various degrees of voice expansion.



ward course does not use them, but that those given, are, in my opinion, sufficiently precise for our purpose.

For reference and aiding the memory, I give the following table from Dr. Rush's celebrated work on the philosophy of the human voice. His work is one of the best I have seen upon the subject.

*Farther hints and examples on the analysis of the voice.*

5. The speaking or reading voice has its melodical ranges. The object of the educator is to make its succession of extending sounds, as agreeable and effective as possible.

6. To do this, he has to study how properly to begin, continue, merge into each successive tone, each letter, syllable, and word, and make the closing tone, suit the character of the idea or composition; and thus, by his own example, show how the tones of the voice run into each other from letter to letter, syllable to syllable, and from word to word, the pausing only making breaks.

7. The continuity of the sound, long or short, must have either an ascending or descending movement; or be continued on the same line of pitch. And the *great aim of the trainer* should be to give his pupil *that command over his own voice*, which will enable him to give it that *direction and character most suited to his reading or speaking*. And when once the pupil is able readily to distinguish these differences of voice-movement, very little difficulty will afterwards attend the training of his voice.

8. In going over the sounds which constitute words or sentences, there should be a *clear onward unity of tone*,—all the *sounds nicely sliding, or running into each other*.

The most effectual way to do this, is to exercise the pupil on the elemental sounds of letters, as embodied in words. When each elemental sound is pronounced singly and separately, it receives an individual energy of organic effort, and with a distinctness of sound and definite outline, which make an excellent preparatory for correct and forcible pronunciation in the compounds of speech. An exact pronunciation of the elements, as embodied in words, is of very great importance. Nor should this exercise be discon-

12. The rising third, fifth and octave are the well known signs of interrogations; and the downward, the movements of positive declaration and command. The plaintive intonation of the semitone, up or down, is easily recognized.

13. All the movements of the voice must be effected in an easy, agreeable manner; and suited to the character of the composition. The beauty of speech consists in both skilfully varying the order of phrases, as they move onwards, and in correctly managing the rise and fall of the voice through the whole compass of pitch.

14. "The good effects of such exercises are many. Their whole tendency is to give great command of voice; impart variety to its quality; create a strength of organ, give confidence to the speaker or reader; and an unhesitating facility, within the range of ordinary exertions of speech." The whole voice as thus trained, acquires so much command over his vocalization, and its various modifications and gradations that he knows how far, and with what force advantageously to extend his voice.

Three other principles of reading here require notice, viz. accent, emphasis and cadence.

15. Accent may be defined,—that marked, fixed feature of a word by which it is distinguished. Its seat has an *audible prominence* in words. Every word has its accentual distinction, even monosyllables. In have, *ha* is accentually distinguished from *ve*; in change, *cha* from *nge*, &c. This has been shown in preceding notations. Accent, therefore, has reference to those distinctive parts of words which give *unity* to their parts. Accent is the *tie* by which the parts of words are brought together, giving them an embodiment, as emphasis is the exponent of special thoughts or words, respecting their significancy or emotional character. The peculiar office of accent respects pronunciation; that of emphasis thoughts or ideas. Accent and emphasis both give great variety to speech,—the latter especially. Both, therefore, demand the special attention of the teacher: the first with reference to the most approved orthoëpy of words; the second with respect to

expression, including almost every function of the voice. The varieties of emphasis are, therefore, numerous. Time, pitch, stress, inflection, and the various special forces of voice in tone and emotion have all to do with the proper application of emphasis. Emphasis is absolute or relative,—absolute, when applied to a single thought or feeling of peculiar energy; and relative, when it occurs in the utterance of two or more words or ideas which correspond or contrast. As accent, either by stress or quantity, or peculiarity of tone, is the tie of words—as words; so emphasis is of thoughts, feelings, &c.,—bringing them conspicuously before the ear—and giving language unity, energy, expression, and variety. Emphasis has reference to every species of composition. Not a sentence can be read with grace, force, inflection or intonation without the application of emphasis. Every sentence has a *sense regulating* word or words, and should be so pronounced, whether by extra force, tone, or peculiarity of pronunciation, as to give such words their distinctive utterances.—But we make a distinction between the *relative force* words have in sentences, and *special emphatic force*. Take for illustration the following sentence: “The more a man knows the less conceited will he be.” In this sentence, **CONCEITED**, is the *special word*, and requires the most *expressive* pronunciation; the word, *knows*, comes next; then, *more* and *be*; *man* and *less*, come next; *will he* require still less force; and the *least stress* falls on *the, a, and the*. To read this short sentence so as to bring out its full meaning, its words require *six degrees* of force as indicated by the following notation:



The more a man knows, the less conceited will he be

The *special emphatic force* here falls on *ceit*, in *conceited*. All the other words have their relative forces with reference to it.

It does appear that emphasis is no more than a *generic term*, comprehending the varied applications of every mode of the voice, for enforcing thought and passion. The quality, quantity, and force of the voice, generally, show the ear emphatic distinctions. These are shown by any interval of the scale, ascending or descending. A monotone utterance sometimes marks the emphatic word, or words. The different kinds of emphasis are very various. We have the radical, the median, and the vanishing emphases; the emphasis of pitch, and the emphasis of the wave; the simple and the compound emphasis, &c.—A volume would scarcely be sufficient to do full justice to the subject of emphasis.

16. *Cadence* is another important part of the melody of speech.

Cadences may be distinguished into the slight, the middle and the full. The slight cadence is a small descent of voice, showing that more is to follow; generally made at periods; sometimes also at other points. The middle is confined to sentences not depending on each other in construction, but more marked at the end of sections, or divisions of any composition. A full cadence shows that we are come to a conclusion.—As cadences are generally the most sensible parts of composition to the ear, their reading demands great care. Un...s read so as to have proper effect the reading is deteriorated. As cadences are different their words should be so pronounced and joined in reading as to suit their kind, and likewise the sense of what is read and the character of the composition. A flat, unsuitably lifeless cadence should be carefully avoided. It vitiates delivery.

Sentences which have a full harmonious close admit of the best descent of voice. Those which consist of thirds, or three steps, with proper tones, have the best effect. To have a telling effect the voice should assume a preparatory movement and suitable character,—ascending, a second, a third, or a fifth, as the sense or close may require; to these reading principles special attention should be paid. The proper construction and reading of the cadence part of sentences, or any piece of composition, is essential to the just melody of speech; for having the peculiar character of a close, and occurring not so often as other phrases, its reading more emphatically affects the ear. This subjects it to more discriminating attention. Excellence in any cadence, however, is the work of an *educated ear*, an ear quick and correct in distinguishing the beauties of every kind of varied intonations.

*Illustrations of voice-movements, Emphases, and Cadences.*

| Monotone movement of the voice.

The continuation of any function of the voice on any pitch, is a *monotone movement*. This may be the first pitch of the voice;

or any other assumed pitch. But, generally, the pitch is low; and when not at the beginning of sentences, lower than the preceding pitch. And the change of the voice should be such as to show its monotone character—which is *deep and solemn—resembling the tolling of a heavy bell*. This succession of tone should not be long continued. When long continued it becomes offensive. Sometimes a change of voice, and deviation from the level tone, for an *instant*, adds to the effect of the reading. At the end the voice should so drop its monotone character, as to become at once manifest to the hearer.

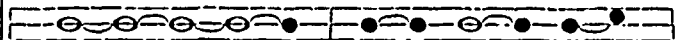
In reading any piece of composition monotonically, the words are often closely linked together though separated by commas.—The subjects which are most suitable to this kind of reading, are grand and sublime descriptions—such as strike the mind with profound veneration, awe, amazement, &c.

To know when to use it effectively requires much study and practice.

*Examples of monotone voice-movements.*

1st. Ex.

Oh thou vast o - cean! e - ver sound-ing sea!



Thou sym - bol of a drear im - men - si - ty!



What line can mea - sure thee | or reach thy depths!



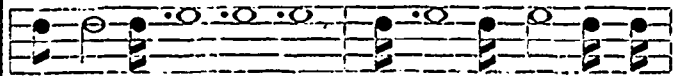
—To be read slowly; intonations to be full, impressive and relatively prolonged, as the notes direct. The tone of each word should be regulated with reference to its correct pronunciation and place in the sentence. The onward way movement of the voice is marked by *curved lines* which extend in succession from note to note. The voice neither rises nor falls more than a semitone, except at *sea*, the two last syllables in *immensity*, and at *depths*, which is intended for effect: and for the like reason the third line should be read at least one tone lower, ending with a slight cadence.

N. B.—Observe that monotone reading,—to make it effective,—requires the voice to pass sometimes from a level tone; and requires at the end often special attention paid to cadences.

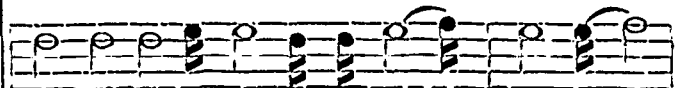
In the notation of the following sentence, which describes the highest sublimity of ideas, the phrases of melody are applied to show a slight departure from the pure monotone,—showing a few of the varied functions of the voice.

2nd. Ex.

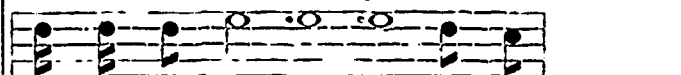
I saw a great white throne, and Him that sat on it;



from whose face the earth and the heavens | fled away,



and there was found no place for them.



In this notation the semibreves and minims indicate an impressive, prolonged fulness of tone,—the semibreve of course the *longest* prolongation. The prolongation of the other notes is according to their value. The more strongly emphatic notes are dotted. The voice should have an onward current of tone from pause to pause. The places of pausing are marked by bars.

3rd. Ex.

This example shows a more extended range of voice—with the same symbols and marks used.

Let us bless and hallow our dwellings | as the homes of  
 freedom. Let us make them too, the homes of a noble freedom—  
 of freedom — from every corrupting bondage | of the soul.

This sentence gives examples of the three cadences,—the slight, the middle and the full. The first is at *freedom*; the second at *noble freedom*; and the third at the end of the sentence.

4th. Ex.

This example illustrates an octave range of voice.

I tell you | though you, though all the world, though an an-gel from  
 hea-ven | should de-clare the truth of it, I would not be-lieve it.

5th. Ex.

Example showing more of the emphatic slides of the voice.

The growth of a mighty tree | from a small seed, may be  
 a mat-ter for won-der, for ad-mi-ra-tion; but the  
 de-ve-lop-ment of a being ca-pa-ble of such  
 tre-men-dous a-gen-cies, for good or for e-vil,  
 should be a mat-ter of the deep-est con-cern. Strange  
 —pas-sing strange—it is not so!

This example requires to be read with energy; and the dotted notes with special emphasis. The last sentence should be read

with considerable prolongation of voice—making a momentary halt between the words.

6th. Ex.

This example is given to show the immediate continuous rising slides.

Ah! Is it pos-si-ble it can be so? Is it re-al-ly so?

The interjection *Ah* requires a concrete upward slide of a minor third. Pronounce the dotted notes with firm discrete tones.

7th. Ex.

Example showing the emphatic falling slides.

Down | sooth-less in - sul - ter: vain will be your ef - forts.

8th. Ex.

Examples of question expansions of the voice.

Is he earn - est in in - struct - ing you, think you?

The voice generally has a rising tendency when questions are put by *verbs*. In this question the voice descends in only two places; viz., at *earnest* and *think*.

9th. Ex.

Je - sus | saith un - to them, But whom say ye that I am?

The question being put by *whom*, it ends with the downward slide.

10th. Ex.

Was it your wel - fare or his own he re - al - ly wished?

Here the voice has its highest ascent at *fare*, in *welfare*, and its lowest at *wished*. The movements of the voice are made to contrast, so as to agree with the contrast in the question.

11th. Ex.

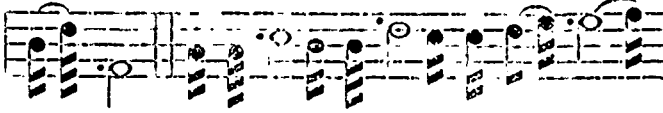
Question showing the intensive rise and fall of the voice.

Whom have I wronged?—What pro - vince have I oppressed?—

What ci - ty pillaged?—Have I un - just - ly taken estates?—

Whom have I robbed of his pro - per - ty?—On whose rights have I

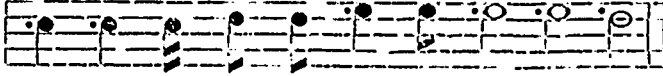
e-ver treched?—On the weak and the poor, have I e-ver tram-pled?



12th. Ex.

Questions followed with answers.

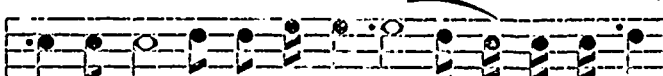
Q. What gave to La - fay - ette his spot - less fame?



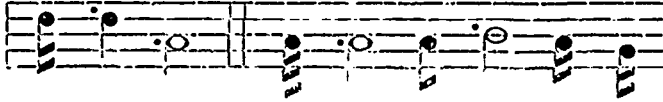
A. The love of Li - ber - ty.



Q. What has con - se - crat - ed his me - mo - ry in the hearts



of good men?—A. The love of Li - ber - ty.



13th. Ex.

Q. Are they He - brews?—A. So am I.



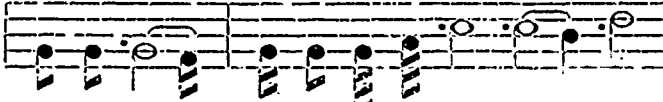
Q. Are they Is - ra - el - ites?—A. So am I.



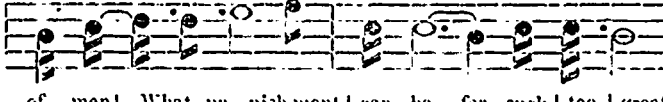
14th. Ex.

When all or many of the words of a sentence are emphatic, inflections should so alternate as to give a suitable and pungent force, as well as vivacity to the whole sentence,—as shown in the following notation.

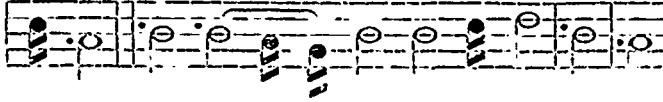
He is **guil - ty** | of one of the most **shame - ful** acts |



that e - ver **de - grad - ed** the **na - ture** | or the **name** |



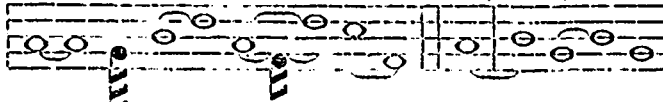
of men! What **pu - nish - ment** | can be for such | too **great**



Sometimes the *three* movements of the voice—the up, the down, and the level, may be made effectively on one word.

15th. Ex.

How like a **fawn - ing** pu - bli - can he looks! Mark | his **ser - pent** tongue



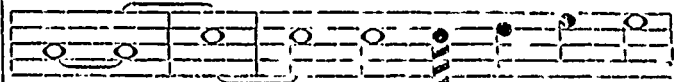
The *curves* show the sweep of the voice; and the heavy line the onward level tone of the voice.

These wavy movements of the voice should be well studied. It is not an unfrequent sign of expression—applied to expressions of a peculiar sense, and having a double meaning. It is generally used to indicate tones of irony, sarcasm or mockery. Its constituents may be any interval from a semitone to an octave ascending or descending—intermingled often with monotones.

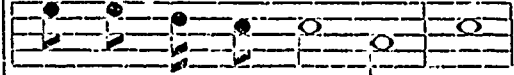
16th. Ex.

Showing the wave on special words.

In - deed! so | she took the reins of govern -

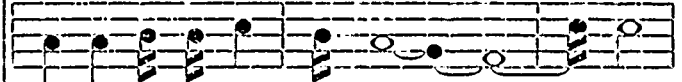


ment in - to her own hands, *ch!*

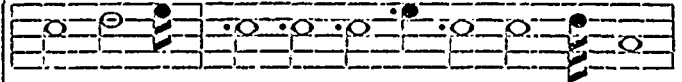


17th. Ex.

I say un - to you, that So - lo - mon | in all



his glo - ry | was not ar - ranged like one of *these*.



The words especially pronounced with wavy tones are *Solomon* and *these*. These words should be pronounced with energy; and the tone should be dignified.

Waves of some intervals have more effect than those of others.—The waves of the *second* and *third*—*minor* especially—when well executed, have an effective and dignified character, bring out the meaning of the words waved with *marked effect*; and contrasted ideas with more manifest distinction.—But in going over an *extended* multiplied wave, be sure to make the tone of the voice firm, manly, free of approach to musical modulation. The common vocal sing-song, whether in reading prose or verse, completely destroys, or rather prevents the intended effect of the wavy pronunciation of words. Therefore, study well what words should have a wavy pronunciation, and when pronounced, let it be in a *telling propriety of execution*.

(To be continued.)

### Sympathy with Children.

One of the *great* secrets of success in managing the young is sympathy with them as children. Nothing but this will lead to a proper understanding and appreciation of the motives by which they are governed, or enable us rightly to estimate the efforts they make for improvement. The following indicates that the writer had taken one valuable lesson as a teacher:

“At one period of my life, when instructing two or three young people to write, I found them, as I thought, unusually stupid. It happened about this time to look over the contents of an old copy-book, written by me when I was a boy. The thick up-strokes, the crooked down-strokes, the awkward joining of the letters, and the blots in the books, made me completely ashamed of myself, and I could at that moment have burned the book in the fire. The worse, however, I thought of myself, the better I thought of my backward scholars; I was cured of my unreasonable expectations, and became in future doubly patient and forbearing. In teaching youth, remember that you once were young; and in reproving their youthful errors, endeavor to call to mind your own.”

It was as true of us as of Paul that when we were children we *spoke, understood, and thought*, as children; it will be true of all other children. If, then, we would influence them, would control them entirely, we must remember that they are *children*.

The young act from *impulse* rather than *reflection*; many of their acts, troublesome though they may be, and apparently designed to annoy us, are merely the result of momentary impulse—entirely



harmless in itself, acted out not from deliberate intention, but merely from the absence of that consideration or reflection from which alone self-control results. A child whispers to a seat-mate or class-mate because he happens to think of something too good not to be told. The boy, full of life, with healthful blood coursing through his frame, does not sing or whistle, 'it whistles itself.' A child often laughs because it sees something really laughable. Who of us has not felt an irresistible inclination to do the same, even under circumstances in themselves the most solemn?

Happy is the teacher who can really enter into the feelings and motives of childhood; and fortunate is the teacher who can discriminate between the apparently wrong actions which are caused by such sudden impulses, and those which are the result of deliberate intention to do wrong. Such a teacher will be willing to receive with a good grace the frank statement by the scholar of the real cause which prompted the act; and while he receives the statement in a proper spirit, as did the one who was told by the boy who had laughed during the devotional exercises

"I saw a mouse in time of prayers  
Come down the rope for want of stairs,

he will rise, rather than sink, in the estimation of the scholar and the school.

True, the things here spoken of must not be allowed to pass without rebuke, but the measure of reprehension must be proportioned to their real character; and it is the clear perception of what is required, and the just discrimination shown, which marks the true teacher, which commands the confidence and respect as well as the esteem of scholars.—*Ohio Journal of Education.*

### Penmanship.

In the first place, then, the mere power to represent words to the eye in written—made with pen and ink—letters, is but a portion of this branch of education,—the whole of which is equally essential, though parts of it are not as frequently used as mere word-writing. The whole branch has been well termed 'GRAPHICS,' and embraces the ability to present to the eye, by means of the pen, pencil, or crayon, on paper or other surface, letters in combination so as to form words, the arithmetical figures, the mathematical and other signs and diagrams, and the forms of natural and artificial objects, so far as can be done by mere lines. To do all this rapidly, neatly and accurately, is to be a graphist; while to be a good writer of words, is to be but partly a graphist. And however, expert in penmanship, in this limited sense of the term, a person may be, and however numerous may be the occasions when this degree of skill in the art will be found sufficient for his needs, yet there will occasionally occur instances and cases in which the power rapidly and accurately to present figures, other than letters and the signs of number, to the eye, will be found of the utmost advantage.

Engineers, surveyors, mechanics of all kinds, the man of science, and even the female, in reference to embroidery, &c., are frequently required to give line drawings of objects; and, in most cases, they are just as frequently made to feel the imperfection of their education in this respect, by the difficulty they experience in the attempt.

Further, it has long been known,—or rather it is so obvious and true as never to have been questioned—that in the outline presentation of natural and artificial objects to the eye, there are certain lines or forms which may be called principles,—that are invariable and essential,—so essential, in fact, that the instant they are departed from, the principle involved is violated and the attempted representation ceases to be the natural representation. A right line,—or the shortest distance between any two given points,—can only have one representation.—If the line is in the least crooked, it is not a right line. The figure with any part of its periphery more or less distant from the centre than the rest, is not a circle, no matter how *roundish* it may be; and the equal-sided triangle cannot possibly have one of its sides longer than the others. So of any given house, or country, or other fixed object; the outline of the one or the boundary line of the other, is always the same; and the same is the fact with regard to the same mountain, planet or animal. Each has its own form, when viewed from the same point,—the correct outline of which is its own graphical representation.

Latterly it has been discovered, or more properly speaking the fact has been applied, in teaching,—that the Written Letters and other Signs used in handwriting, have also their elemental or

essential principles of form, the proper combination and execution of which constitute correct and beautiful writing. It is true that masters of the art differ from each other somewhat in regard to the manner of the combination of these elemental forms into letters; but the difference is, perhaps, rather in the fact that some are more and some less complicated and ornate than others, than in any essential differences in the forms themselves.

One thing, however, in reference to these radical forms in writing is as noticeable as it is suggestive of the true course in teaching the art:—and that is, that while the letters are more complicated in form and difficult to be produced, than any other figures,—as straight, horizontal, vertical, inclined and parallel lines, circles, angles,—yet that these simpler forms are also the elements of the letters. And it is also true, that the learner will more readily judge of the correctness of his attempts at presenting the simpler class of figures, than in the case of the more complicated letters;—thus indicating, that manual exercise and practice of the eye, both so necessary to good writing, will be more beneficial in the formation of the simpler forms than in that of the letters.

Here, then, would seem to be the starting point, viz: *Practice till perfect* in those fixed and simple forms, of the correctness of which the learner can judge from his own previous knowledge of things.

The next object would seem to be a sufficient practice in these, to give him *perfect command of the muscles*, in their formation.

And, finally of these rudimental exercises,—*practice of the eye and exercise of the judgment* as to comparative length, size, distance, direction, &c., in the production of these forms, seem to be indispensable.

Thus exercised and in possession of his own powers in reference to the simpler forms and their relations, it seems to us that the learner is prepared,—and not before—to cope with the complications of Letter-making; and thence to proceed to the final department of graphics,—the out-line representation of all the objects in nature and art, of which it may be necessary for him to give sketches in the ordinary avocations of life.

The following brief article from the *Connecticut Common School Journal*, is in point here:

"Several months ago, in visiting the school of Mr. Harsh, in New London, we witnessed a brief exercise which might very profitably be introduced into all our schools, and that without any interference with the regular lessons. It was a simple lesson, intended to train the eye and judgment in estimating distance or length. The plan was somewhat as follows:—A class of ten or twelve boys was called to the blackboard, when directions were given to draw a line six inches long; a line two feet long; a line three feet long; a figure one foot long and eight inches wide; a circle six inches in diameter; a line one yard long, divided into feet and inches, etc.—After each was done, the teacher passed along with a measuring tape or stick, and tested each. The pupils had some practice in such exercises, and they performed them with a surprising degree of promptness and accuracy. They had gained habits of observation and comparison. Not more than five minutes at a time need be taken at the board, but it will be found that the pupils will be induced to spend many minutes, that would otherwise be misimproved, in practising upon their slates."

But equally necessary with the training of the eye, is that of the hand;—the one to tell what to do, and the other to do it. And in training the hand properly to execute the suggestions of the eye,—the first thing to be regarded, is the posture of the whole person in the art of delineating. If the body be not properly placed in reference to the desk or table, the writer will work at a disadvantage. So, if the pen or pencil be not properly held, the hand will be unable to execute with facility, grace and precision.

And just here, we apprehend, is the origin and cause of much bad writing, and we state it in conclusion, that it may be the better borne in mind: "The use of a stub of a slate pencil an inch or two long, when the pupil first begins to produce forms and letters on the slate, gives that cramped and improper mode of holding the pen, which remains with him all through life, and is wholly incompatible with facility and beauty in hand-writing." Consequently, the teacher who introduces and insists on the use of a long pencil or a pencil-holder, from the first, and thus secures the proper holding of the pen, by this simple first precautionary act in teaching to write, does much to ensure to his pupils a good hand.—*Pennsylvania School Journal.*

## SCIENCE.

## GEOLOGY AND COSMOGONY.

AN INTRODUCTORY LECTURE TO A COURSE OF NATURAL HISTORY  
BY MR. DENTON.

(Reported for the *Montreal Herald*)

We look over the face of the world and see mountains towering in majesty above us, clad with snowy mantles that a thousand winters have woven; valleys lying in beauty at their feet; deep caverns where twilight reigns continually; lakes that sleep in the mountain's arms like babes on their mother's breast, and mighty oceans having their world of waters, and grinding to powder the rocks that gird them. (Applause.) What a multitude and variety of organic existence we behold; tall cedars rearing their giant heads and mosses carpeting the ground at their feet; humming-birds flitting from flower to flower; whales floating like islands; and considering all these, Man, upright standing, upward-looking, the fruit of the ages, and the brain of the world. (Applause.) A closer observation of the earth reveals to us, beneath its surface, beds of sand, clay and gravel; others in the more solid forms of sandstone, shale, conglomerate and limestone; and interspersed with them, remains of organic bodies innumerable, of shells and fishes, of birds and beasts. Who is so incurious as not to desire to know the history of all these? Who would not wish to know when these mountain chains were heaved, and what heaved them? When those caverns were carved, and what carved them? When the mountains lifted their heads above the waves and looked proudly up at the stars above them, and down on the world that lay sleeping at their feet, and when the rivers first coursed down their slopes, and commenced the work of carrying them back to the ocean? All must be interested in the answers to those questions. Where is the volume in which this history is recorded? There is no volume of man's making that could contain the one thousandth part; but it is written by nature in the rocks around you and beneath your feet. She has faithfully recorded every action, however trivial, and we may read her own statement of facts more wonderful than the fiction of Arabian fancy. (Applause.) All unconsciously the fiery volcano has written its turbulent history with a burning pen; the coral and the sea-weed have traced their life story in the plastic rock; the fishes, reptiles, birds and beasts of the olden time have inscribed their biography for us to read. By the study of Geology we can obtain the knowledge on these various subjects that every thinker should desire. The farmer ought to be interested in Geology. A knowledge of geological science has done much for agriculture. In New Jersey, where the soil was shifting sand, and fertile crops seemed an everlasting impossibility, Geology taught the farmer that there lay beneath the sand valuable marl, and when this was spread over it, luxuriant harvests was the result. Prof. Rogers stated in his geological report to the Legislature of New Jersey, that land which previous to the discovery of this marl sold for \$24 an acre, is now worth \$37 an acre? The science as every one knows, is of vast importance to the miner. By the aid of Geology the miner's lottery is frequently transformed into a bank, from which he draws exhaustless supplies. As every miner, knows no seam of coal that will pay for working has ever been found in rocks that were geologically below the coal measures, and yet, what sums of money had been expended in digging for coal in these lower rocks. The black shales of Canada had been explored in this manner, when it was impossible for coal to exist, because the plants from which coal was produced had no existence in the earth at the period when they were deposited. How important is the science to the Philosopher. If you wish to build a philosophy firm and enduring as the pillars of heaven, lay its foundation deep in the earth, by a knowledge of what geology alone can teach. If the history of two thousand years, written by the fallible pen of man, be important to philosophers, how much more important the history of countless ages, written by the historians who have infallibly recorded the facts of the wondrous past. (Applause.) Geology should be studied for the happiness that it affords. All knowledge increases our capacity for enjoyment. A laborer after having a volume of Geology in his hands, goes to work, and with every move of the crow-bar turns over a new leaf, and he finds himself a happy student in nature's college, furnished with an excellent library, and the aid of professors. The Lecturer proceeded to point out the advantages to be derived from studying astronomy. What Astronomy does for the

heavens, Geology does for the earth. We sometimes call the earth our mother, and in a very important sense of the word she is.

He then went on to say that he proposed to give her parentage, her condition as an infant, and relate some of the most remarkable events of her history up to the present time.

The facts of Astronomy led men to form a theory with regard to the formation of this globe, which accorded remarkably with what Geology reveals to us, and a knowledge of this seems necessary at the outset, for it sheds light on many facts in Geology. Mr. Denton then explained in a very able and lucid manner the nebular theory, according to which he proceeded to say, there was a time in the most infinite past, when all the matter now contained in the sun and the various bodies of the solar system, existed as a mighty globe, then occupying all the space now occupied by them, and probably much more. A globe about ten thousand millions of miles in diameter and in an exceedingly heated condition. This stupendous globe was in motion from west to east and radiating its heat into space. As its heat decreased, it of necessity became smaller and smaller, moved with greater velocity, when the tendency of the matter at the equator was to separate from the main body, in the shape of a zone or ring by virtue of the increased centrifugal force. The ring flows into a globe by the attraction of gravitation, and thus we may suppose Neptune was launched into space, it in turn becoming the parent of smaller globes. Lastly the earth was formed, with her solitary child the moon, the last fertile planet of the solar system. The planets are globular bodies because they were originally fluids and the law of gravitation rounded them in the same way as it spheres a teardrop on the cheek. The planets are moving bodies, move in the same direction, and nearly in the same plane and that plane nearly coincides with the sun's equator because the sun communicated its motion to the rings that were separated from it and being separated from the sun's equator, they still remain in about the same plane. The elder and younger Herschell, La Place, Mitchell, Mantell, Dr. Buckland, &c. Humbolt, have all given this theory the sanction of their names. Indeed there are but few that appear to militate against it. Behold the earth then,

"It goes its glorious course to run,  
A fire-globe struck from the burning sun."

Uproll the curtain that unnumbered ages have dropped, and view the wondrous scene. Before us spreads a fiery ocean; bounded only by a fiery sky, its lightning-capped billows heave heavily under the influence of the moon, and now as if mad they leap in fury to the ruddy clouds that loiter above them. Hissing, seething, boiling like a huge caldron, white dense vapors rising continually from its agitated surface, it presents to us a picture that none but a demon could truly paint. Its air, if air it may be called, is hotter than the Volcano's breath, and more deadly than the dead simoon. There is no night there with grateful shade and cooling dews; no winter whose piercing winds may assuage this terrific heat; there is but one unvarying fiery day—one interminable burning year. (Applause.) That the earth was once in a condition resembling this, there can be but little doubt, and the arguments are important to consider. First, the increase of temperature as we descend into the interior of the earth. As we descend the heat increases one degree for every sixty feet. The most accurate conclusions in reference to this increase of heat in proportion to depth, may be obtained from Artesian wells. If the heat continues to increase with increased depth, at a depth of a little more than two miles, we should have a temperature of 210 degrees, or the heat of boiling water. At a depth of seven miles, it would be hot enough to melt lead, and at forty miles it would be 2553 degrees, at which temperature it is difficult to conceive of any substance remaining solid. It may be considered as almost certain that we stand upon a rocky crust over a fiery ocean, this crust bearing about the same proportion to the ocean that the shell of an egg bears to the fluid contents of that egg. If a fly was asked what he thought of an egg, the answer would doubtless be "it is a mountain of marble." When its fluidity is hinted at, "it cannot be possible," says the fly, "have I not climbed its hills, wandered through its valleys and stamped upon it my mighty foot?" "Solid, solid," says the fly, "it cannot be otherwise;" and there are human flies who reason in the same way, because, like the fly, they know no better. (Applause.) Another reason why geologists believe in the original fluidity of the earth, is owing to its peculiar shape—that of a globe. Why this peculiarity? It is well known that when a body is revolving rapidly in a circle, it has a tendency to fly from the centre of that circle, by virtue of centrifugal force. There is the same tendency in the particles of matter comprising the globe to fly from the centre; but if the earth was absolutely solid, they could not obey this tendency; but the

shape of the earth proves that they were once free to move on in a fluid condition. This could not have been from the water comprising it, for at but a short distance from the surface, it is too hot for water to exist. Hence the earth was originally a molten globe, and its shape was produced by its motion, for a mathematician can take the mass of the earth, and the rate of its revolution, and calculate what shape its centrifugal force would give it; and the very shape that it should be according to his calculation, is the identical shape that it possesses. Hot Springs furnish us with another evidence of the internal heat of the globe, and give us reason to believe in its original fluidity. They are widely scattered over the face of the earth, and some of those mentioned by Strabo and Herodotus, are still flowing though more than 2000 years have elapsed. If a lady keeps a kettle boiling for a day, it requires considerable fuel; how then does nature keep her large kettles boiling for thousands of years? Evidently from this grand reservoir of heat in the interior of the earth. (Applause.) If we need any further evidence that the earth was once in this state Volcanoes supply it. Humbolt enumerates 225 active volcanoes, and it is probable that if they were all known, their number would be at least doubled. What are these volcanoes but so many chimneys communicating with this grand central fire, and from which escape smoke, ashes and devouring lava. The lecturer then proceeded to give a graphic description of the eruptions of Vesuvius and various other volcanoes, relating in an eloquent manner the particulars of the destruction of the beautiful cities of Herculaneum and Pompeii on the shores of the Mediterranean. Whence came all the material that was vomited forth from these volcanoes? The mountain evidently did not furnish it, neither could it come from its immediate vicinity, or a cavity would have been formed into which the mighty mountain would have sunk. It doubtless came from that grand ocean of melted matter, as truly beneath our feet as it was beneath the feet of the inhabitants of Herculaneum and Pompeii. These eruptions, occurring as they have on such widely separated portions of the earth, are strong evidences of the fluid character of its interior, and since we know the earth has existed for millions of years, cooling during the whole time, we are naturally led back to the time when it was one grand volcano, but with no crater to confine its fiery waves. Additional evidence is furnished by earthquakes. It is probable that, taking the whole earth, we have, on an average, an earthquake a day. He then described the remarkable earthquake which occurred in Lisbon, in 1755, by which terrible convulsion it is calculated that one-twelfth of the area of the globe was shaken. How deep seated must the cause have been that would produce so wide spread an effect. Taking the wing of a dusky demon, let us descend into the nether region, and see if we can discern the cause of these convulsions that shake the earth so disastrously. Through alternating strata of sandstone and limestone we descend for thousands of feet, passing the graveyards of unnumbered generations. Here is a mineral vein by which we can descend more readily. What masses of lead in sheets and gigantic cubes lining immense caves! But we cannot remain long to admire it. Down again through beds of mica, schist, gneiss, granite and quartz in beds of immense thickness and white as the driven snow in the sunlight of a frosty morning. What is that shining substance? How bright and beautiful! It is gold—a lake of solid gold. It has sunk in the centre as it cooled, and there is a grand golden amphitheatre left, a mile in diameter. Down again through the centre of this golden flood. We are driving through the ribs of the earth, to its warm heart, and a night, dark, hot, and stifling closes around us. In the distance we behold a faint gleam—the rocks are cherry red, now fall red, and now they glow like the walls of an iron furnace. A little further and we stand on the shore of the fiery ocean, and breathless with terror we look upon a scene such as mortal eye never before beheld. A stillness like that of death hangs over it, and yet it does move; it ebbs and flows like the ocean. It is not always thus calm as now. At times there are dreadful storms, when these fire waves roll and dash in fury, and a storm on this ocean below is an earthquake above. Between this fiery ocean and the rocky mass is a vast arched space, against whose sides the fire waves beat, and deposit rock continually, and there are times when masses of this overhanging rock, weighing millions of tons, drop into the ocean beneath, and this produces a wave which, rolling to where roof and ocean are in contact, uplifts the rocks to the surface, and we have the earthquake wave, most violent nearest the place of disturbance, and dying away as the waves of the underground ocean sink with a calm. (Applause) All earthquakes may not be produced in this way, but many of the most disastrous that have shaken this planet have been occasioned in some such manner. There are many facts presented to us in the study of Geology that can only be accounted for by a knowledge of the original igneous or fiery con-

dition of the earth, and its gradual cooling during long ages. How long has it taken for the earth to come into the condition in which we have it to-day? But Nature has never been niggardly of time. Lava thrown out of a volcano three years ago is not yet cool. There came a time then when a rocky crust was formed over this planet, and the whole face of the earth was one vast wilderness of rock. It was perhaps during this time that the great granite rocks were formed. The granite is a great underlying rock, that is under all the others, and is composed of quartz, felspar and mica. The quartz very hard, the mica a sealy shining substance, used in some places for window glass and the felspar, a soft substance, used in making pottery. The next rocks formed were the Metamorphic, so called because of their being changed by the action of fire. Metamorphic rocks prevail very much in Canada. They are not all of the same age, neither are the granite rocks.

## LITERATURE.

### POETRY.

#### THE CROSS.

Greater the cross the nearer heaven,  
*Godless*, to whom no cross is given!  
 The noisy world in masquerade  
 Forgets the grave, the worm, the shade;  
 Blest is yon dearer child of God,  
 On whom he lays the cross, the rod.

Blest, by whom most of the cross is known;  
 God whets us on his grinding-stone;  
 Full many a garden's dressed in rain,  
 Where tears of sorrow never rain.  
 In fiercest flames the gold is tried,  
 In griefs the Christian's purified.

'Midst crosses, Faith her triumph knows;  
 The palm-tree pressed more vigorous grows;  
 Go, tread the grapes beneath thy feet—  
 The stream that flows is full and sweet;  
 In trouble, virtues grow and shine,  
 Like pearls beneath the ocean brine.

Crosses abound; love seeks the skies;  
 Blow the rough winds, the flames arise;  
 When hopeless gloom the welkin shrouds,  
 The sun comes laughing through the clouds;  
 The cross makes pure affection glow,  
 Like oil that on the fire we throw.

Who wears the cross prays oft and well;  
*Bruised* herbs send forth the sweetest smell;  
 Were ships ne'er tossed by stormy wind,  
 The Pole-star who would care to find?  
 Had David spent no darksome hours,  
 His sweetest song had never been ours.

From trouble springs the longing hope;  
 From the deep vale we mount the slope;  
 Who treads the desert's dreariest way,  
 For Canaan most will long and pray;  
 Here finds the trembling dove no rest,  
 Flies to the ark, and builds her nest.

Heavy the cross, e'en death is dear,  
 The sufferer sings—his end is near;  
 From sin and pain he hursts away;  
 Trouble shall die that very day.  
 The cross, yon silent grave adorning,  
 Bespeaks a bright, triumphant morning.

Greater the cross, the lovelier rays  
 The crown prepared of God displays;  
 Treasure, by many a conqueror worn—  
 Who wears it now before the throne.  
 Oh! think upon that jewel fair,  
 And heaviest griefs are light as air.

Dear Lamb of God, enhance thy cross  
 More and yet more; all else is dross;  
 Let ne'er a murmur mar my rest,  
 Plant thy own patience in my breast;  
 To guard me, faith, hope, love combine,  
 Until the glorious crown be mine.

## HUSBAND AND WIFE.

The world had chafed his spirit proud  
By its wearing, crushing strife,  
Suspicion, censure, the thoughtless crowd  
Had showered on a blameless life;  
Like the dove of old from the water's fount,  
He wearily turned to the ark of home.

The hopes he had cherished with joyous heart,  
Had toiled for many a day,  
Body and spirit, with patient art,  
Like mists had melted away,  
Now o'er day dreams vanished—o'er fond hopes flown,  
He sat him down to grieve alone.

No not alone, soon soft fingers rest  
On his hot and aching brow,  
Back the damp hair is gently pressed,  
Whilst a sweet voice murmurs low:  
"Thy joys have I shared, oh, my husband true,  
And shall I not share thy sorrows too?"

Vain task to resist the loving gaze  
That so fondly meets his own,  
Telling she courts or cares for praise  
But from him and him alone;  
And though censure and grief upon him fall,  
To her, at least, he is all in all.

What if false friends now turn aside,  
Or gaze with icy look;  
What if he meet the pitying pride  
The high heart ill can brook;  
There are depths of love in one gentle heart,  
From whose clinging faith, death alone can part.

Aye! well may thy brow relax its gloom,  
For a talisman hast thou,  
'Gainst hopes quick blighted in early bloom,  
Against scornful look or brow—  
Her heart is a high and a holy throne,  
Where monarch supreme, thou reign'st alone.

Kindly return her tender gaze,  
Press closely that tender hand,  
Whisper fond words and soothing praise,  
They are e'er at thy command—  
'Tis all her true heart will ask to reap  
In return for love as the ocean deep.

MRS. LEMMON.

## OFFICIAL NOTICES.



## APPOINTMENTS.

## EXAMINERS.

His Excellency the Governor General in Council, on the 18th of October 1862, was pleased to make the following appointments, viz.:

Rev. André B. Dufresne, *Curé*, Rev. Charles Boucher, *Curé*, Rev. Michael McAuley, *Curé*, Joseph Lefebvre, Hyacinthe N. Casavant, Esquires, to be members of the Catholic section of the new Board of Examiners of Shefford; and the Venerable Joseph Scott, D. D., Rev. Robert Lindsay, A. M., Rev. G. B. Bucher, George B. Baker, A. M., and Azro H. Chandler, Esquires, to be members of the Protestant section of the said Board of Examiners, which is to meet alternately at Waterloo and Swetsbury and is authorized to grant Elementary school diplomas only, to have force and effect solely within the Counties of Shefford, Bromé, and Missisquoi.

Hon. Pierre Winter, Rev. Charles G. Fournier, *Curé*, Rev. Nicolas Audet, *Curé*, Rev. J. Pierre Saucier, *Curé*, Rev. George Milne, Rev. John Wells, Etienne Martel, Esq., to be members of the new Board of Examiners of Bonaventure, which is to meet at New Carlisle and is authorized to grant Elementary school diplomas only, to have force and effect solely within the Counties of Bonaventure and Gaspé.

Rev. Dominique Racine, *Curé*, and Rev. Joseph Hudon, *Curé*, to be members of the Board of Examiners of Chicoutimi, in the room of Rev. Jean Bte. Gagnon and Rev. Joseph Hollman, both absent.

His Excellency the Governor General in Council, on the 27th October last, was pleased to appoint Rev. Charles A. J. Ouellet, *Curé*, and George A. Parvis, Esq., to be members of the Board of Examiners of Pontiac.

## SCHOOL COMMISSIONERS.

His Excellency the Governor General in Council, on the 18th of October 1862, was pleased to approve of the following appointments:

County of Dorchester.—St. Edouard: Messrs. Joseph Audibert and Thomas Duff.

County of Arthursville.—Stanford: J. H. L. St. Germain, M. D., Esq.

His Excellency the Governor General in Council, on the 14th of November 1862, was pleased to approve of the following appointments:

County of Gaspé.—Anse à Grifonds: Messrs. Joseph Sirois, Alexis Malouin, Eugène Jalbert, Hilaire Robinson and Jean Pignon.

County of Quebec.—St. Colomb de Sillery: John Sharples, Esq.

County of Pontiac.—Mansfield: Messrs. James Burton, William Gillis, Joseph Lafrance, James Arnour and Robert Stewart.

County of Lotbinière.—South St. Sylvestre: Rev. Edouard Fafard, *Curé*.

Same County.—St. Gilles: Messrs. Joseph Guay, *ainé*, and George Côté.

County of Wolfe.—Garthby: Messrs. Edouard Grenier, Hubert Normand, Pierre Lemieux, François Giguère and Ferdinand Gagné.

County of Dorchester.—Cranbourne: Messrs. James Cuddy and James Hines.

County of Vaudreuil.—Ste. Marthe: Rev. Dieudonné Bérard, *Curé*.

## SCHOOL TRUSTEES.

County of Napierville.—Sherrington: Messrs. James Deen, David Edgar and Robert Leatham.

County of Drummond.—Durham No. One: Mr. Abraham Clerc.

## ERECTIONS, DIVISIONS, &amp;c., OF SCHOOL MUNICIPALITIES.

His Excellency the Governor General in Council, on the 24th October 1862, was pleased to detach District No. One from the School Municipality of St. Jacques l'Achigan, in the County of Montcalm, and erect it into a separate municipality by the name of the *School Municipality of District No. One of St. Jacques*, with the following limits: Embracing all the lands situated between those of Jean Louis Marion and Isaac Marion inclusive, on the Seignior line road, and the land of Edouard Dugas (the latter not included); also, the two concessions on each side of the said road, included in the above limits.

His Excellency the Governor General in Council, on the 27th October 1862, was pleased to erect the Townships of Labarre, Méry, Plessis, Caron, Signay and Metabetchouan, in the County of Chicoutimi, into a municipality, under the name of the *School Municipality of Hébertville*.

## DIPLOMAS GRANTED.

## PROTESTANT BOARD OF EXAMINERS FOR THE DISTRICT OF MONTREAL.

Mr. John K. Little has obtained a first-class Elementary diploma (*English*), and Mr. Libère Tétrault a second-class Elementary diploma (*French*).

Messrs. Charles H. Leaver, James Truscott, William M. Wilson, and Misses Sarah Cameron, Emma J. Gibson, Elizabeth Laprairie, Elizabeth McDonald, Lucretia S. Martin, Margaret Morison, Margaret Outterson, and Margaret Jane Robinson have obtained Elementary diplomas of the 2nd class (*English*).—Nov. 4, 1862.

T. A. GINSON,  
Secretary.

## PROTESTANT BOARD OF EXAMINERS FOR THE DISTRICT OF QUEBEC.

Mr. Jonathan Earl and Mrs. J. W. Trusdell have obtained first class Elementary diplomas (*English*).—Nov. 4th, 1862.

D. WILKIE,  
Secretary.

## SHERBROOKE BOARD OF EXAMINERS

Messrs. Wm. B. Ives and Sam. H. Shonyo have obtained the first-class Academical diploma (*English*);—Mr. James H. Chandler the first-class Model school diploma (*English*);

Mr. Arthur G. Bompas and Misses Jessie Bonnahic, Elizabeth Cockburn, Elizabeth Forsythe, Jane L. Ives and Mary A. Smith first class diplomas (*English*), and Messrs. John F. Carr, Gardner Fletcher, Reuben P. Smith, Albert W. Young and Misses Ellen M. Bean, Catherine Knapp and Emma M. Kimbald second class Elementary diplomas (*English*).—Nov. 4, 1862.

S. A. HURD,  
Secretary.

## BOARD OF EXAMINERS FOR THE DISTRICT OF THREE RIVERS.

Misses Clarisse Beauchemin, Olysine Dureault, Louise Dubois, Eléonore Hamel, Marie Lemaric and Elise Massé have obtained diplomas for Academies;

Messrs. George Boucher and Noël Pinard, and Misses Dina Bourgeois, Ovide Duguay, Adéline Héon, and Caroline Héon, Model-school diplomas;

Messrs. Adélard Clément, Jean Garneau and Joseph Ricard. Mme. C. Maxime Paquin; Misses Marie Victoire Bellemard, Adée Belly, Delphine Bergeron, Olive Boisclair, Aurée Baril, Delphine Beaudoin, Marie Louise Benoit, Césarie Bisson, Lumina Blondin, Louise Brassard, Olive Côté, Eléonore Côté, Emérance Coulombe, Eliana Doucette, Adéline Doucette, Lia Dupluis, Cécilise Guillemette, Adélaïde Gélinas, Philomène Gilbert, Alice Grandeler, Dina Gouin, Emilie Gélinas, Hermine Gill, Léontine Hébert, Céphise Héon, Apolline Lami, Sophie Masson, Blandine Mailhot, Henriette Moulin, Marie Justine Marchand, Marie Dorimène Millette, Esther Pratte, Sara Paré, Eulalie Provancher, Marie Adéline Pelletier, Olive Vincent and Emérance Verville, Elementary diplomas.—June 3rd, 1862.

Misses Marie Elzire Geffard and Georgiana Ouellet have obtained first-class Elementary diplomas (*French*).—Nov. 4, 1862.

J. M. DESILETS,  
Secretary.

## OTTAWA BOARD OF EXAMINERS.

Miss Mary Hilton has obtained a 1st class Elementary diploma (*E*); Messrs. Thomas Austin, Edward Obre and Daniel Orman, and Misses Hannah Driffin, Eliza Kerns, Ann Mooney and Maria Taber 2nd class Elementary diplomas (*E*);

And Mr. Louis Berthiaume a 2nd class Elementary diploma (*F*).—Nov. 4, 1862.

JOHN R. WOODS,  
Secretary.

## STANSTED BOARD OF EXAMINERS.

1st class Elementary certificate (*English*).—Mr. Amos M. Austin, Miss Rebecca J. Chapman and Miss Lucretia B. Lovejoy.

2nd class Elementary certificate (*English*).—Messrs. Otis W. Brown, Orange M. Chamberlin, Jonathan Chapman, Whiting R. Call, Charles Furber, Clement B. Jenkins, Cyrus A. Searles, Edwin R. Thompson, Zenas P. Whitcomb, Oscar F. Willey, Melville E. Webb, Miss Ellen C. Hovey.—Nov. 4, 1862.

C. A. RICHARDSON,  
Secretary.

## RICHMOND BOARD OF EXAMINERS.

Mr. A. D. Ciarke and Misses Lucinda M. Bothwell, Eliza A. Atkinson and Rebecca J. Elliot have obtained 1st class Elementary diplomas (*English*);

Messrs. Silas Henry Butler and George Davis, and Misses Sarah Jane Robinson, Jane A. Gustine, Mary Ann Fee, Maria Mountain, Mary J. Reed and Sarah Doying 2nd class Elementary diplomas (*English*);

Misses Sophie Blais and Eugénie Cloutier, 1st class Elementary diplomas (*French*);

And Misses Louise Lacerte, Alma Lacerte and Edwidge Raymond 2nd class Elementary diplomas (*French*).—Nov. 4, 1862.

J. H. GRAHAM,  
Secretary.

## BIMOUSSI BOARD OF EXAMINERS.

Mrs. Robert Turiff has obtained a 1st class Elementary diploma (*E*).—Nov. 4, 1862.

P. G. DUMAS,  
Secretary.

## BOARD OF EXAMINERS OF BEAUCE.

Misses Cécilise Bérubée, Marie Catherine Blais, Marie Hébert, Philomène Hébert and Adéline Vallée have obtained the first class Elementary diploma (*French*); and Miss Octavie McKenzie the second class Elementary diploma (*French*).—Nov. 4, 1862.

J. T. P. PROULX,  
Secretary.

## SITUATIONS WANTED.

A Teacher of several years' experience, provided with an Elementary diploma from the McGill Normal School, is desirous of obtaining a situation. He is a Protestant and a native of England. Address J. R. Loyd, New School, Diamond Harbor, Quebec.

## DONATIONS TO THE LIBRARY OF THE EDUCATIONAL DEPARTMENT.

The Superintendent of Education acknowledges with thanks the following donations:

From Messrs. Gustave Bossange & Cie., Paris: "Cours complet de géographie," 1 vol.—"Atlas universel de géographie, de M. Babinet," 1 vol.—"Histoire des Etats-Unis d'Amérique par Théophile Ménard," 1 vol.—"Histoire de Christophe Colomb, ou Découverte de l'Amérique," par G. Neumann," with 19 other volumes.

## JOURNAL OF EDUCATION

MONTREAL (LOWER CANADA) NOVEMBER, 1862.

## Boards of Examiners.

In another column will be found an official notice of appointments to the new Boards of Examiners for the counties of Bedford and Bonaventure, completing the new organization.

The Boards which are organized shall notify the Superintendent of Education of the appointment of their respective Secretaries; and it is necessary that the notification be signed by the President in each case. It is also the desire of His Excellency the Governor General that no member of a Board of Examiners shall fill the office of Secretary.

At a meeting of the Council of Public Instruction, held on the 11th instant, two of its members, Messrs. Dunkin and Delagrave, were deputed to inspect the Boards of Examiners in pursuance of the 14th Article of the Rules and Regulations. The Superintendent will share with these gentlemen the task of visiting the divers Boards and reporting the result of their mission to the Council. Instructions, also, have been given to a committee of the Council to draft a series of rules for the classification of public schools.

## Inauguration of Morrin College, at Quebec.

The inauguration of the new and already promising institution known as Morrin College took place Thursday evening in the Masonic Hall, St. Lewis street, a portion of which has been set apart for the use of the College, pending the erection of more suitable and commodious buildings which—we believe—will be undertaken within the least possible delay.

The ceremony had been looked forward to with considerable interest, not only by the many friends of its late founder to whose munificence it is due; but by those who have watched with feelings of admiration the zeal and energy displayed by the Reverend Principal in carrying out the intentions of the late Dr. Morrin. It was generally felt, too, that the inauguration of a collegiate institution,

which is intended to occupy the same position towards our English-speaking youth, which Laval University holds towards the French, was indeed an important event in the history of the city. It is not surprising, therefore, that the attendance was large. A spacious Gothic chamber, in the upper part of the hall, had been set apart for the inaugural ceremonies; but the accommodation which it afforded proved rather limited. The worthy secretary of the College, D. Wilkie, Esq., was indefatigable in his exertions for the comfort of the spectators; and seats were provided for all the ladies, and nearly all the gentlemen—with the exception of a few of the late arrivals.

The Principal, Rev. Jno. Cook, D. D., occupied the chair. Around the Principal's chair, besides the Rev. Professor Hatch, and the Governors, were seated the students who were about to be enrolled, wearing the academic costume. Beneath the canopy which surmounted the platform was suspended a striking portrait of the founder. The learned professors were well represented in the audience. Amongst the audience we observed Hon. Mr. Justice Meredith; Hon. C. Alley and G. H. Smart, Esq., representatives of the city; E. A. Meredith, Esq., J. Langton, Esq., and many other prominent citizens.

The Principal opened the proceedings by stating that he would briefly detail the circumstances under which Morrin College was founded. He read the deed of gift, by Dr. Morrin, executed on the 26th September, 1860, in favor of Rev. Dr. Cook, W. S. Smith, and James Dean, senr. The Act passed in the 24th year of Her Majesty's Reign, he (the Principal) would not read, inasmuch as it was based upon the instructions of the founder with which it was in all material respects identical. It had been resolved to carry out these instructions at the present time, and a beginning had therefore been made. It was, in consequence, his duty to declare Morrin College opened. In doing so, however, he would beg of those present to join him in prayer that the intention of the founder might be worthily fulfilled.

After an appropriate prayer—

The students came forward, to the Secretary's table, and—to the number of nineteen—signed their names on the collegiate roll, in the following order:—J. W. Cook, H. McNab Stuart, Ivan T. Wotherspoon, Henry D. Scott, R. H. Browne, Thos. D. Oliver, A. Robertson, Wm. Cook, Robert Cassels, jr., D. R. Wilkie, Wm. Clint, Henry J. Morgan, Joseph R. Racey, John MacNaughten, Charles Hamilton, J. T. Colston, Fredk. Lampson, John Hugh O'Neill, and Theo. H. Oliver. The newly enrolled students then, after a cordial welcome, individually, by the Rev. Principal, resumed their seats.

The Principal said that, after having so far performed his duty, he would proceed to explain the purposes and prospects of the College. With regard to the former, it was the will of the founder that provision should be made for young men desirous of preparing to enter the ministry of the Church of Scotland. But while this was the case, it was a mistake and a misapprehension to suppose that it was to be devoted solely to the teaching of divinity. There were different opinions held with regard to the nature of university education; but it would be the aim of the institution just inaugurated to give that system of training which was most calculated to enlarge and strengthen the mind. Of what did such an education consist? First, by common consent, came the study of those noble languages which have been handed down to us from past ages, by means of which the rich treasures of antiquity could be explored. Next came the mathematical sciences, as well in their useful purpose of training the powers of the mind, as in their application to the useful arts. Then came the natural sciences, with their daily increasing wonders, liable every day to be altered or modified. There were also the useful studies of logic and moral philosophy to aid in the development of the reasoning powers. He (the Principal) had not mentioned the modern languages in this list of studies—not, however, because he was disposed to underrate their importance; but because they came more properly within the range of institutions of an elementary nature. No one, however, could deny the benefit which would be derived from a course of studies such as that which he had sketched. It would not only improve the recipient morally; but tend materially towards the enlargement of his understanding. It was such a course of study which—to the full extent of their means—would be pursued at the College now inaugurated. The main object of the institution would be to impart an excellent collegiate education, on principles of Christian morality; but avoiding, in the general course of instruction, anything of a sectarian nature. The Rev. Principal then spoke of the learned professions, and urged on those who entered upon the study of these professions the necessity of being prepared beforehand, by a thoroughly liberal academical course—if they desired, besides obtain-

ing a license to practise the profession of law or medicine, to acquire the knowledge which was necessary in order to possess a thorough general education of the highest class. Nor was it necessary that a collegiate education should be confined to the professions. It would be of equal advantage to those who followed the honorable pursuits of mercantile life. Knowledge of a higher nature not only tended to cultivate and dignify the occupation; but it also was of great benefit in the spread of science and the great cause of progress. Another advantage of a collegiate education was that it served to develop and perfect the result of classical studies, much of which would be otherwise lost. A course of the higher kind of educational training was also particularly necessary when school education ceased—at a time when the passions were beginning to obtain a sway, and the youthful mind, unless occupied with the noble ambition arising from intellectual pursuits, was apt to become addicted to idle and trivial pleasures. Academical education, imparted in a right spirit, was also intimately connected with the political and moral progress of this young and rising country. It was important that the men who held the destinies of the country—those who ruled the land through their power of guiding public opinion, should not be men of weak understanding, of limited knowledge or of narrow-minded and prejudiced ideas; it was important that they should, on the contrary, be men of extensive information, powerful intellect and thorough moral training. In order to cultivate and foster such qualities in our youth, it was necessary that their teachers should be men of Christian principles as well as intellectual greatness. Such men would be provided for this new institution. But with regard to its inauguration, some might say—why multiply colleges? To those who asked this question he would say that the other colleges in the country were, in most instances, too far away to be of general use to our young men. It was true we had, in this city, a university conducted on a most liberal and munificent scale; but, owing to the fact that it was a Catholic institution and that its courses were in the French tongue, it could not supply the wants of Protestant and English-speaking young men. He then spoke of the prospects of the institution, and said he hoped, before the session now opened was brought to a close—that several new professors, including lecturers on two different branches of jurisprudence, would be added to the College. He desired, before closing, to thank the proprietors of the noble building in which they were met for their liberality in placing it at the disposal of the College; also to express his thanks to the Literary and Historical Society for effecting an arrangement with the collegiate authorities which, he trusted, would prove mutually beneficial. He might mention that a proposal had been made for the affiliation of Morrin College to McGill College, Montreal, by means of which the students of the former would enjoy the same advantages as if they were students of the latter. With regard to the number of students enrolled, he would say that it surpassed expectations. It was true that the undertaking was, as yet, an experiment. He appealed to the young, describing in glowing colors the enjoyment and dignity which life gained by the pursuit of knowledge. Moreover, it was a duty which we owed, as well to the Divine Giver of our mental powers as to ourselves, that we should cultivate them; and it was to be hoped that the youth of this community would never prove insensible to the use of their intellectual gifts. The Rev. Principal concluded by expressing his sense of the honor conferred upon himself by his present position; and giving utterance to a hope, although he felt conscious that he had reached the evening of life, that he might see the College entered upon its full career of usefulness. Before sitting down he paid a delicate and well appreciated compliment to the merits of the Rev. Professor Hatch.

The speaker thus terminated an eloquent address (of which we have endeavored to give an abstract) amid the repeated applause of the audience.

A brief interval was permitted, for refreshments, which were served in an adjoining apartment, in the most tasteful manner, and of which those who were present partook, upon the invitation of the Governors.

Rev. Professor Hatch then delivered the introductory lecture. Devoted entirely to a subject of the most appropriate nature for the opening of such an institution as Morrin College—treated in the most skillful and scholar-like, and at the same time the most comprehensive and logical manner, we cannot pretend to give more than a passing notice in the narrow limits which the press of other matter and the lateness of the hour leave at our disposal. It was at once a correct exposition of the nature of classical studies, and a noble defence of their utility. The speaker commenced by unveiling the fallacies set forth by the superficial and unreasoning advocates of classical study who did more injury to the cause than its

enemies. The necessity of the mind undergoing a course of mental gymnastics, so to speak, which would develop its resources and increase its vigor, was first demonstrated. The next point touched upon was the argument urged in favor of the physical sciences as a discipline of the mind, against which it was conclusively shown that the classics were, to say the least, as efficient for the purpose of mental discipline. With regard to the advocacy of the modern languages as being fully as effective and at the same time more useful, the lecturer explained the difference of analytical and synthetical languages; and urged the superiority of the latter in training the understanding, inasmuch as acquiring the knowledge of them involved the necessity of a progressive course of study. They afforded also a much clearer insight into the laws of language; they served a great ultimate purpose, and if it was intended that education should consist of more than a mere knowledge of reading, writing and arithmetic—if it was desired that knowledge should be anything more than a mere marketable commodity—the study of the classics was an absolute necessity. The lecturer then proceeded to demonstrate, at considerable length and in the most brilliant style, the many advantages derived from the study of the languages, defining them with a precision and clearness which was the best evidence of his powers. He concluded his discourse amid repeated outbursts of applause.

The Principal, after complimenting the lecturer on his theme, announced that the proceedings had terminated, and thanked the many friends whom he observed present for their attendance.

The audience then dispersed. Many, however, before leaving, visited the lecture-room which has been fitted up for the use of the students.—*Quebec Chronicle*.

### Extracts from the Reports of Inspectors of Schools, for 1859 and 1860.

#### Inspector Boivin's Report.

There were in this district of inspection one convent school, one academy, one model school and thirty-six elementary schools, conducted by nine male and seventeen female teachers.

These establishments were frequented by 1444 pupils, of whom 777 were boys and 667 were girls. With regard to the branches taught, the Inspector classified these children thus: spelling 468; reading off-hand 976; reading well 302; learning to write 802; simple arithmetic 420; book-keeping 5; history 292; orthography 448; French grammar 594; English grammar 32; grammatical analysis 330; composition 52; geography 223; translating from English to French 64; Latin 7.

The state of school affairs in each municipality of the district was as follows:

1. *St. Fidèle*.—Three schools in operation, conducted by female teachers. The school in District No. 1, under the management of Miss Marie Brassard, was the best. No. 2 was also well conducted, the energetic and talented teacher in charge having had eight years experience. The other school was closed at the time of the Inspector's visit, on account of the severe cold and the bad condition of the roads. Arrears of assessment due the commissioners amounted to £18. 0. 0; while their liabilities were £25. 0. 0.

2. *Malbaie*.—This municipality maintained five schools. The boys' department of school No. 1 was conducted by Mr. O. Martin, who would soon require the services of an assistant, in consequence of the increasing attendance; he taught English to a few of his scholars. The girls' department was entrusted to an able teacher. The schools in Districts No. 2, 5 and 6 were managed by female teachers with results more or less satisfactory, though irregular attendance was a source of complaint. The teacher in charge of school No. 4 was entitled to special commendation for the skillful manner in which she discharged her duty. The finances of the municipality were carefully looked after by the Secretary-Treasurer, Mr. E. Tremblay.

3. *Ste. Agnès*.—Four schools were open at the time of the visit. That of District No. 2, conducted by Miss Delima Poivin, claimed the precedence. Arithmetic and the usual branches were successfully taught. The pupils of school No. 1 were not so punctual in attending, and consequently not so far advanced in their studies. The schools of Districts No. 3 and 4 were kept by young female teachers just entering upon their career. In the absence of the Secretary-Treasurer the Inspector was unable to examine the books or accounts of the corporation.

4. *St. Irénée*.—Three schools were kept in this parish. District school No. 1 was too overcrowded to permit the teacher in charge to advance her pupils as might have been done under more favora-

ble circumstances. The examination at District school No. 2, was attended with very satisfactory results, the pupils reading and writing with much precision, and giving unmistakable proofs of proficiency in the elements of French grammar. The female teacher under whose management this success was attained had had charge of this school during three or four years past. School No. 3 had been in operation only nine or ten months, its pupils could not therefore be much advanced. The Commissioners discharged their duties in a satisfactory manner, and the affairs of the municipality were well attended to.

5. *Eboulements*.—Five schools were in operation in this municipality. The School Commissioners had used their best endeavors to place the model-school on a proper footing, and at the time of the visit it was attended by 60 pupils, under the care of Mr. Cléophas Côté who spared no pains to ensure their progress. The girls' class was taught by Miss Boudreau. District school No. 2 was conducted by a teacher who had acquired several years' experience and who appeared to discharge his duties in an efficient manner. District school No. 3 also possessed an experienced teacher; but school No. 4 was not properly provided with the articles indispensable to the progress of its scholars. The teacher in charge of No. 5 District school appeared to fulfil her duties with commendable zeal and punctuality. The commissioners were remiss in the collection of the assessments, though with this exception every attention was paid to the school affairs of the municipality; the arrears amounted to £120, and there was an outstanding debt of £40.

6. *Township of Seltrington*.—There was but one school in this municipality, and the settlers were too poor to adopt the system of school assessment.

7. *St. Urbain*.—Two schools were opened. Although the teacher of District School No. 1 (Mr. O. Larouche) was in receipt of a very small stipend he seemed zealous in the discharge of his duties. District school No. 2 had been managed during seven or eight months by a young lady. The financial affairs of the municipality were in perfect order.

8. *St. Paul's Bay*.—This municipality maintained an academy, a convent-school, conducted by the Ladies of the *Congrégation de Notre-Dame*, and 11 elementary school establishments (including the elementary departments of the academy and the convent). The academy was frequented by 50 children, and had been only two years in existence. It was under the care of Mr. O. Perron, who has followed a classical course of study at the Seminary of Quebec; his assistant, Mr. Simon Côté, taught the elementary class. Three of the primary schools were conducted by male teachers, and the remainder entrusted to ladies who have received their training at the local convent-school. Of these 11 schools, 3 were inferior, 1 was indifferent, 5 were good, and 2 excellent. The accounts of the corporation were kept with regularity.

9. *Petite Rivière St. François*.—Only one school maintained here. It was successfully managed by Miss Adelaïde Thalon. The financial affairs of the school corporation were in a satisfactory condition.

10. *Ne-aux-Coudres*.—This municipality possessed four schools, one of which was under private control. The private school was attended by 27 pupils and supported by 18 contributors, who in addition paid the tax to the school corporation. District school No. 1 was conducted by a successful teacher, and her pupils made great progress. District school No. 2 was kept by an able young teacher who had, however, only entered upon her duties a few months previous to the visit. The teacher in District School No. 3 complained of the irregular attendance of her pupils and of the want of progress in consequence. The business of the municipality was transacted with punctuality and exactness.

11. *Escoumains*.—There was but one school open in this municipality. The lady under whose care it was placed received a salary of £25 per annum.

Mr. Boivin in concluding his Report calls the attention of the Superintendent of Education to the existing desire, on the part of the rate-payers of all the municipalities he has visited, to avail themselves of the liberal provisions of the school law, under which the rich and poor alike enjoy the right of obtaining instruction.

### Notices of Books and Publications.

NORTH AMERICA; By Anthony Trollope. Published by Harper & Bros, New York; 1862.—1 vol. 12mo, 624 pp.

Who does not remember Mrs. Trollope and her terrible book, in which Brother Jonathan saw himself so cruelly caricatured? Her son, the author of a good number of literary works, aims in the present instance at political economy, social science &c., often, however, permitting himself to usurp the satirical vein so peculiar to his parent. If he has

dealt more equitably with our neighbors, it is certainly at the expense of our less fortunate province; for the observations upon Canadian affairs recorded in his pages are not only replete with anachronisms, but appear to have been made under very unfavorable circumstances to say the least, while the revival of the long since exploded prognostications regarding the evil destiny of our fellow-citizens of French descent is of a nature to mislead the general reader as to the actual development of the country.

**THE MAGDALEN ISLANDS, their topography, natural history, social condition and commercial importance;** By Rev. George Sutherland. Hazzard, Publisher, Charlottetown, P. E. I. 1862.—12mo, 50 pp. Sold for 25 cents.

The Magdalen Islands, though forming part of Lower Canada, seldom claim our attention except indirectly, through efforts made in New Brunswick or Prince Edward Island. These two colonies have indeed, at different times, attempted to annex this group—an undertaking in which they nearly succeeded on one occasion, as the islanders, no doubt discouraged by the neglect they had suffered, seemed eager for the change, and little opposition was made by our government, whose information as to the value and extent of the natural resources of the territory in question was restricted within very narrow bounds. The fortunate action, however, of Mr. Christie, at that time member of Parliament for Gaspé, and the favorable reports of Capt. Fortin, Inspector of the Fisheries, attracted the attention of our public men to this valuable possession and served to prevent its alienation.

In 1853 the Legislative Assembly caused to be published a very interesting account of this part of the country; and an excellent article by Lieut. Baddeley on its geology and natural history, is contained in the third volume of the *Transactions* of the Literary and Historical Society of Quebec, printed in 1857. We would refer those who, after perusing Mr. Sutherland's interesting pamphlet may feel desirous of obtaining further information, to the publications above indicated.

The Magdalen Islands are eleven in number, with many small islets and detached masses of rocks; the principal members of the group being thus designated: Magdalen, formerly *le Royale* and sometimes called after Admiral Coffin; Dead Man's Island, All Right, Ile-aux-Meules or Grindstone, Amherst or Aubert, in which the Circuit Court is held; Ile d'Entrée, Aux Oiseaux, Bryon, and Corps-Mort. The people devote their energies to the fisheries, as the herring, mackerel, cod, porpoise, seal and walrus abound. Whales also frequent this part of the Gulf of St. Lawrence and are not infrequently captured. The soil is fertile in many parts, and valuable mineral products are found. The population is principally composed of Acadians and Canadians, and numbers 2659 souls. There are six churches and chapels—three Catholic and three Protestant.

The emphyteutic system upon which the lands have been granted has a tendency to retard the improvement and lower the value of property in these islands, rendering their possession of less importance to the country than it otherwise would be.

**GÉOGRAPHIE MODERNE;** By Mr. Holmes. 6th Edition. Desbarats and Derbyshire, Printers, Quebec; 1862.—12 mo, 894 pp.

**ÉLÉMENTS DE GÉOGRAPHIE MODERNE à l'usage des Ecoles** Printed by Desbarats and Derbyshire, Quebec; 1862.—1 vol. 12 mo, 71 pp.

**TRAITÉ D'ARITHÉTIQUE à l'usage des écoles;** By Jean Bouthillier: Daireau, Printer, Quebec; 1862—12 mo, 180 pp.

These new editions of school books approved by the Council of Public Instruction for Lower Canada, were much required, not only because the former were exhausted, but as alterations in the text had become absolutely necessary to suit the new order of things.

The Geography of Mr. Holmes will replace the school works hitherto imported from abroad, which always contain inaccuracies in descriptions of Canada and America generally.

**TRANSACTIONS of the Literary and Historical Society of Quebec.**—Vol. V, Part 1. 8vo, 164 pp.

This number is dated May 1862, but was not issued from the press until quite recently. It contains the following articles: "1.—E. D. Ashe, Lieut. Royal Navy, F. R. S., &c.—Notes of a Journey across the Andes in Peru. 2.—E. A. Meridith, LL.D.—An important but neglected branch of Social Science. 3.—John Langton, Esq., M.A.—On the age of Timber Trees, and the prospects of a continuous supply of Timber in Canada. 4.—Documents sur les voyages et sur la vie de Jacques Cartier. 5.—Rev. James Douglas.—Belief of the Ancient Egyptians regarding a Future State."

Although not in a position to say that the views advanced by Mr. Langton in his article on the Timber Trees of Canada are in every particular correct, we admit that he has touched upon a matter of the utmost public importance. The rapid disappearance of our forests before the woodman's axe, is a very serious matter when taken in connection with the declarations of our geologists that no coal beds exist in the country. Under the present system, the lumberers having no direct interest in the reproduction of trees, remove them carelessly during their temporary occupation of the land, which is then turned over to the settler. To prevent the total destruction of our valuable forests, Mr.

Langton suggests that the Government shall sell, instead of leasing, certain tracts of land for the special requirements of the timber trade, among which the systematic reproduction and growth of forest trees are, of course, included.

The documents relative to Jacques Cartier are printed in the language in which they have been originally written, and will serve to clear up some obscure points in that distinguished navigator's biography, they are highly interesting, and great credit is due the gentlemen who were instrumental in bringing them to light. The Literary and Historical Society of Quebec caused to be published in 1843 the most complete edition of Cartier's voyages extant: it was compiled in part from the Rouen edition (1596) of the account of the first voyage, now very difficult to obtain, from a valuable MS. account of the second voyage, contained in the Royal Library of Paris and supposed to be the original and to have been written about the middle of the 16th century, and from Hackluyt's account of the third voyage, translated from the English by Mr. Faribault. The public will, we are sure, not fail to appreciate the renewed efforts of the Society to unveil the early history of Canada and of the men who played so conspicuous a part in those stirring times.

**LES ÉLÉMENTS DE L'AGRICULTURE, à l'usage de la jeunesse canadienne;** By James Smith, Professor of Agriculture at the Agricultural and Industrial College of Rimouski. 12mo, 117 pp. Office of the *Canadien*, Quebec. Sold for 25 cents each, or \$2.40 per doz.

The author has dedicated this work to the Minister of Agriculture, and we are informed that he intends to submit it to approval to the Council of Public Instruction for Lower Canada.

## MONTHLY SUMMARY.

### EDUCATIONAL INTELLIGENCE.

—At the Annual Meeting of the Colleges constituting the Queen's University in Ireland, the Lord Chancellor, who is Vice-Chancellor of the University, stated that 116 members had passed their academical examinations during the year—a larger number than in any previous year—and that of the 745 students in attendance during the last session, 293 were members of the Established Church, 200 Roman Catholic, 247 Presbyterians, and 25 members of various other religious denominations. The number of annual entrances had increased from 196 in the session of 1858-59 to 312 in the last session—a number almost identical with those who had entered the ancient University of Trinity College.—*Educational Times.*

—The Rev. Mr. Brunet, Professor of Botany in the Laval University has just returned from Europe with a collection of works on Botany and several herbariums, fruits, roots &c., in waxwork, intended for the museum of the university. We presume that the Botanical Garden will now be proceeded with under the supervision of the learned professor.

—The meteorological apparatus of Dr. Smallwood has been removed from his observatory at St. Martin to the McGill University, near which a new observatory will be established under his direction.

### LITERARY INTELLIGENCE.

—It is announced in Quebec that a new collection of native literary essays and compositions, which have not yet appeared in book form, will be published under the name of "*Le Foyer Canadien*," several former contributors to the *Soirées Canadiennes* constituting a committee of compilation, and Messrs. Desbarats & Derbyshire printing the work. The proprietors of this *recueil* intend to present each subscriber, if a sufficient number be obtained to cover expenses, with a volume of 400 pages, entitled, "*Les Poètes et les Littérateurs Canadiens de 1850 à 1860.*" It is also announced that the publication of the *Soirées* will be continued under the management of Mr. Taché, formerly connected with the enterprise, and who will now be assisted by several new contributors.

—Mr. Eugene O'Curry, one of the most laborious philologists and archaeologists of Ireland, says the *Paris Athenæum*, died on the 30th of July last, of disease of the heart. He had been engaged in revising the translation of the Brehon laws, edited by himself and the late Dr. O'Donovan, and his death will be a heavy loss to the literary circles of that country. It had been his intention, after completing his labors and publishing the whole work, to extract from it the materials necessary for the compilation of a new Irish dictionary. His death has also interrupted the publication of the second volume of his work on the MSS. touching Irish history.

### SCIENTIFIC INTELLIGENCE.

—The celebrated French chemist, M. Boussingault has recently presented a memoir to the French Academy, detailing a series of interest-



ing and highly valuable experiments on the so called respiration of plants, by which he has been led to the discovery of a new and unexpected fact in connexion with this process. Our knowledge of the influence which the green parts of plants exercise on the atmosphere has been but little advanced since the memorable researches of Théodore de Saussure. The separation of the elements of carbonic acid by leaves under the influence of the sun's light, the assimilation of the carbon and the elimination of oxygen, still expresses the extent of our acquaintance with phenomena discovered in the course of the last century; and no sufficiently precise determination has since been obtained of the connection existing between the volume of the oxygen evolved and the carbonic acid decomposed. In all the experiments of Saussure, and also in the very careful experiments of MM. Cloez and Gratiolet, Drapper, and others, a considerable quantity of nitrogen had always been found accompanying the other gases; and this nitrogen, it was supposed, was emitted by the plant along with the oxygen, set free by the decomposition of the carbonic acid in the process of respiration. M. Boussingault was induced to submit this nitrogen to a more careful scrutiny, and he was abundantly rewarded by finding that it contained a portion of a combustible gas. Analysis indicated that this gas consisted of carbonic oxide, with a trace of some carburetted hydrogen. The nitrogen, that had misled Saussure and his successors, was found to be derived from the air absorbed by the plant in its exposure to the atmosphere and the surrounding moisture, and it now appears that during the decomposition of the carbonic acid by the leaves, no nitrogen is emitted, but that the oxygen is accompanied by oxide of carbon and carburetted hydrogen, the combustible gases being produced in the proportion of 1.11 to every 100 of oxygen. Light appears indispensable to the development of these combustible gases. If the apparatus filled with leaves be placed in strong sunlight, but covered with a black cloth, until the water attains a temperature of 38 degrees, the gas collected contains no trace of carbonic oxide or carburetted hydrogen. To keep, then, the expression of these results strictly within the conditions of M. Boussingault's experiments, it may be stated that these combustible gases constantly accompany the oxygen which is evolved from a plant under the influence of solar light when immersed in water impregnated with carbonic acid.

M. Boussingault concludes his memoir by asking, "Is it not curious that after the lapse of a century it should be established before this Academy that probably the leaves of all plants, and very certainly the leaves of aquatic plants, in emitting oxygen which ameliorates the atmosphere, also emit one of the most deleterious gases known—oxide of carbon? In the emanation of this pernicious gas may we not discover one of the causes of the unhealthiness of marshy countries?"—*Educational Times*.

—M. Faye, of the Institute, has, with the sanction of the Government, drawn the attention of the French officers now in Mexico to the Zodiacal light which can be observed at this season to great advantage in that country. This phenomenon, so important to astronomers, and with reference to which so many discordant theories have been advanced, consists of a cone of whitish light, having the sun for its base, and generally perceptible at sunrise and sunset during the equinoxes. In our latitudes it is of rare occurrence, but the nearer we get to the equator the more remarkable is the splendour of the phenomenon. Within the tropics it is almost permanent. The most singular theories have been imagined to explain the appearance of this cone in the heavens. Some have considered it a kind of perspective projection on the celestial canopy of one or more rings of cosmical matter, circulating round the sun, much in the same way as Saturn's rings revolve around that planet. These imaginary rings are believed to lie within the orbit of the earth, but very near to it. M. Biot saw in the zodiacal light a permanent manifestation of one or several rings of shooting stars and aerolites. M. de Tesson, having remarked that the point of the luminous cone was often at a distance of from 90 to 100 degrees from the sun, concluded that this point lay far beyond the terrestrial orbit. According to others, the zodiacal light is simply an immense solar atmosphere, strongly depressed, of a lenticular form, and constituting the matter which feeds the sun. This is the theory of Messrs. Mayer, Waterton, and Thomson. Others again consider the phenomenon to be purely terrestrial—a view of the case which does not exactly agree with the inclined position of the zodiacal light, although the earth's atmosphere has been proved to extend much higher than the fifteen leagues formerly assigned to it. Lastly, the Rev. G. Jones, of the United States, imagines the zodiacal light to be owing to the existence of a very thin ring of nebulous matter circulating round the earth, and within the orbit of the moon. Which of all these views is the true one, further observation will decide.—*Ibid*

—We translate from *Cosmos* the following synopsis of a paper on the nature of azote and the theory of nitrification, which was read before the Academy of Sciences by Mr. Sterry Hunt.

The indifference of free azote to the action of most reagents is a highly remarkable fact presented in its history. In 1848, I suggested that azote when free was the nitryl of nitrous acid, that is  $NH^+O^-$ ,  $NH^2+$ — $H^+O^-$ — $NN$ : corresponding to nitrous nitryl,  $NNO$ , and to phosphoric nitryl,  $NPO$ . It may then be admitted that azote, under favorable circumstances, would, as these two bodies, fix  $H^+O^-$ , to form nitrous acid and ammonia. In April, 1861, I published a note in the *Canadian Journal of Toronto*, in which it was stated that the spontaneous formation of

these two bodies by the combination of atmospheric azote with water explains not only the production, often noticed, of ammonia in the presence of air and reducing agents, but also the formation of a nitrate, during the experiments of M. Cloez, without the aid of ammonia, and requiring only the elements of air and water.

The simultaneous production of azotic acid and of ozone, by the electric spark or the slow oxidation of phosphorus, is explained, according to my view, by the power of nascent oxygen to burn the ammonia, by which the acid of a small quantity of regenerated nitrite of ammonia is set free; and in this manner, certain reactions generally attributed to ozone, appear to be due, as several chemists have maintained, to the presence of a small quantity of nitrous acid formed during the contact of active oxygen with the humid azote of the atmosphere. On the other hand it would seem as if hydrogen, set free by certain reducing agents, had the effect of destroying the nitrous acid of regenerated nitrite of ammonia; also setting at liberty the ammonia of the salt, and even forming a second part of ammonia in consequence of the reduction of the acid.

The ideas here set forth are contained in a note published in *Silliman's Journal* for July 1861, which was reprinted in the *Philosophical Magazine* of London for September 1861, and also in the *Chemical News*. Starting from the observations made by Forchammer and Gmelin, I found that a current of air which had passed through a solution of permanganate of potassa, acidulated with sulphuric acid, had the odor and reactionary property of ozone, which disappeared, however, when the current was forced through a solution of potassa; while the latter after a short time appeared to contain a nitrite. This reaction, which appears to indicate the formation of nitrous acid, not by the catalytic or electric action accompanying the production of ozone, but by the action of nascent oxygen upon atmospheric azote in the presence of water, lends support to my view, and as I have said, the note in question furnishes the key to a new theory of nitrification.

The formation of nitrite of ammonia by the direct combination of nitryl  $NN$  with  $4HO$  is necessarily limited to very small quantities by the want of stability in this salt of ammonia, which being decomposed spontaneously, forms azote and water. To produce a noticeable portion of nitrite by this reaction, it is necessary to employ some active agent, such as active oxygen or a base which can decompose the salt of ammonia. The recent experiments of M. Schoenbein afford a fresh proof of the direct formation of a nitrite from atmospheric azote, and to a remarkable degree confirm my theory of the nitrification and the double nature of free azotic nitryl; but it is evident that since the publication of my note in March 1861, it cannot be said with M. Schoenbein that the generation of nitrite of ammonia from azote and water "is a marvellous discovery and one that was altogether unexpected."

We may add that M. Dumas greatly eulogized the note here referred to, which solves one of the most important problems in the physical history of the globe—the theory of nitrification; and he asked that no part of the contents of this note be rejected even if found to exceed the limits prescribed by the regulations. The honors of the sitting were decreed to the able chemist and geologist of Canada.

—M. Foucault has devised an ingenious apparatus for determining the velocity of light, and from the results thus obtained he computes the distance of the sun from the earth without leaving his study. M. Babinet in stating these facts to the French Academy, observed: "Astronomy by the measure of aberration tells us that the mean velocity of the earth round the sun is  $\frac{1}{80000}$  of that of light. Taking this fraction of the velocity of light we have the space traversed by the earth in one second, and by multiplying by the number of seconds in a sidereal year we obtain the dimensions of the annual orbit of the earth. Half the diameter of this orbit is the distance of the sun from the earth. The solar parallax, according to M. Foucault is  $8''.86$ , with an uncertainty of about  $\frac{1}{500}$ ."—*Intellectual Observer*.

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