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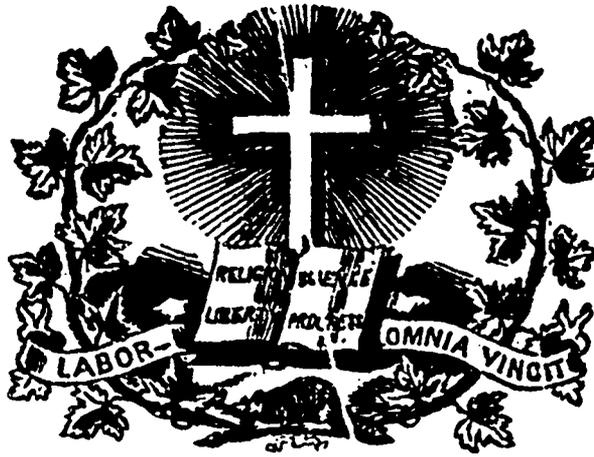
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LITERATURE.

POETRY.

MOVE ON, LITTLE BEGGAR.

BY MRS. A. CAMPBELL.

" Move on, little beggar, move on;
Why are you standing here?"
The man meant not to be harsh,
But his words struck a chill and a fear.

" Move on, little beggar, move on.
Why am I standing here?
And why does he speak to me thus?"
Said the child, as she dashed off a tear.

" Move on, little beggar, move on.
Once he dare not speak to me so:
When I'd father and mother kind,
'Twould not have been thus, oh, no

" Move on little beggar, move on.
The words they strike hard on my heart,
With no one to care for me now,
No dear brother to take my part.

" Move on, little beggar, move on.
I'm wet with the rain and cold;
No shelter have I from the storm,
And my clothes are all tattered and old.

" Move on, little beggar, move on.
In church and shop and hall,
Wherever I go, on my ear
Those words are sure to fall.

" Move on, little beggar, move on.
If on door step I sink me down,
A policeman is sure to come by,
And say those words with a frown.

" Move on, little beggar, move on.,
If the world is one great, long road,
I'll be glad when they drive to the end,
And can no more use that good.

Move on, little beggar, move on.
The fever has moved them all;
Those who loved me have all gone first,
So I to a beggar did fall.

" Move on, little beggar, move on.
Oh, why did they leave me alone,
With such things to break my heart,"
Said the child with a sob and a moan.

" Move on, little beggar, move on.
Kind heaven, oh, hear my prayer,
And take me away up above—
Those words are not spoken up there."

" Move on, little beggar, move on.
The prayer was heard full soon;
Through the hospital wards they rang
Before the wane of that moon.

" Move on, little beggar, move on.
Delirium echoed them high;
And the kind-hearted nurse shook her head,
As she heard that loud, pitiful cry.

" Move on, little beggar, move on.
'Twas Death now gave the command;
And the angels carried the child
Away to a happier land.

Quebec, Sept., 1867.

THE REWARD.

BY JOHN G. WHITTIER.

Who, looking backward from his manhood's prime,
Sees not the spectre of his misspent time;
And through the shade,
Of funeral cypress planted thick behind,
Hears no reproachful whisper on the wind
From his loved dead?

Who hears no trace of passion's evil force?
 Who shuns thy sting, O terrible Remorse?
 Who would not cast
 Half of his future from him, but to win
 Wakeless oblivion for the wrong and sin
 Of the sealed Past?

Alas! the evil, which we fain would shun,
 We do, and leave the wished for good undone;
 Our strength to day
 Is but to morrow's weakness, prone to fall;
 Poor, blind, unprofitable servants all,
 Are we alway.

Yet who, thus looking backward o'er his years,
 Feels not his eyelids wet with grateful tears,
 If he hath been
 Permitted, weak and sinful as he was,
 To cheer and aid in some ennobling cause
 His fellow man?

If he hath hidden the outcast, or let in
 A ray of sunshine to the cell of sin;
 If he hath lent
 Strength to the weak, and in the hour of need,
 Over the suffering mindless of his creed,
 Or hue, hath bent:

He has not lived in vain: and while he gives
 The praise to Him in whom he moves and lives,
 With thankful heart,
 He gazes backward, and with hope before,
 Knowing that from his works he never more
 Can henceforth part

Pittsburgh Catholic.

PEDAGOGY.

The Analytical Method of Teaching English Grammar.

A number of interesting and important topics present themselves to the mind of the teacher, when he considers that portion of his work, which consists in imparting to his pupils a knowledge of the grammatical structure of their native language. For a long time, the study of English Grammar as a separate branch of instruction in schools was entirely neglected, notwithstanding the great amount of attention bestowed upon the classical languages. It is now, however, pretty generally admitted that separate instruction in the grammar of his own language is a necessary part of a boy's education. No object, indeed, can be of greater importance in education, than that of enabling the pupil to use, with facility and skill, the language in which he thinks, and which he ordinarily employs, for the expression of his thoughts. And this object cannot be thoroughly attained without theoretical study of the structure of the language. It is evident that an English boy will most readily and thoroughly acquire a knowledge of the general principles of grammatical science from the study of the English language. Should not, then, the study of English precede that of Latin grammar? This and many other questions which our subject suggests, we shall not, however, dwell upon in the present paper, but proceed at once to that which we have more immediately in view.

We propose briefly to consider the analytical method of teaching English grammar. The ordinary method employed is a synthetical one. The synthetical method commences with the *word*, and having shewn how many and what are the different kinds of words, or parts of speech, then proceeds to explain how these words are modified or inflected, and how they are arranged to form sentences, so as to express thought. The analytical method begins with the *sentence*, as the expression of a *thought* examines the parts into which the sentence is divisible, and the relations between these parts, and then arrives at the consideration of the words of which they are made up.

Which of these methods should be adopted in the teaching of English grammar? We answer, neither exclusively; the analytical method should be employed for imparting the first knowledge of the subject, and especially for bringing out its general principles; and the synthetical method is proper for a more detailed subsequent course, and for storing up in the memory the facts and rules of the subject. As Archbishop Whately has well expressed it,—"The synthetical form of teaching is indeed sufficiently interesting to one that has made considerable progress in any study; and, being more concise, regular, and systematic, is the form in which our knowledge naturally arranges itself in the mind, and is retained by the memory; but the analytical is the more interesting, easy, and natural kind of introduction, as being the form in which the first invention or discovery of any kind of system must originally have taken place." One investigates by analysis, and then arranges the facts and principles thus obtained in a synthetical form, in order that they may be the more readily at command for future use and application.

Neither method, as we have already observed, should be used exclusively. Upon this point we quote the following from Sir William Hamilton's Lectures on Metaphysics:—"Analysis and Synthesis, though commonly treated as two different methods, are, if properly understood, only the two necessary parts of the same method. Each is the relative and the correlative of the other. Analysis, without a subsequent Synthesis, is incomplete; it is a means cut off from its end. Synthesis, without a previous analysis, is baseless; for synthesis receives from analysis the elements which it recomposes."

We have already indicated the nature of the synthetical method as applied to our subject, and it will be quite unnecessary to describe it at greater length, since it is the method employed in almost all works on English grammar. We shall more usefully employ our time and space, in proceeding to a more detailed examination of the analytical method, and of the way in which it may be best carried out; after which, we purpose to answer one or two objections, which have been, or may be made to its employment.

The analytical method commences with the consideration of the *sentence*, as the expression of a *thought*. We have several kinds of sentences; there are simple sentences, each of which is the expression of a single thought; and there are complex and compound sentences, each of which is the expression of the relation between two or more thoughts. We shall, of course, begin by the consideration of simple sentences; and not only so, but since simple sentences are of many degrees of complexity, we shall select for our first consideration those whose structure is the least involved, and which consists of the fewest and simplest parts, viz., those containing a simple or unenlarged subject, and an unextended simple predicate, not requiring an object; such a sentence in fact, as *James writes*.

The pupil is easily made to perceive that this sentence consists of two parts; that the first part, *James* expresses WHAT WE ARE SPEAKING ABOUT; whilst the second part, *writes*, expresses WHAT WE SAY ABOUT James. A few more such examples being given, it is established that all sentences are divisible into two parts, expressing respectively—

(1.) THE PERSON OR THING of which we are so speaking.

(2.) WHAT WE SAY about that person or thing, the former being called the *subject*, and the latter the *predicate* of the sentence.

After being sufficiently exercised in analysing sentences such as the above into these two parts, the pupil's attention is directed more particularly to the *subject*; and he is shewn by examples such as *John runs*, and *He runs*, that the subject may consist either of the name of the person or thing, when it is called a *noun*, or of a word used instead of the name, and called a *proun*. A sentence, such as *The man runs*, is then taken, in which he observes the word *The* prefixed to the noun *man* in order to particularise or point it out. By the help of other examples he becomes acquainted with three such words, viz., *A*, *An*, *The*, which he is told are called *articles*.

The teacher will now select three sentences, such as; *The man walks*, *The man is beaten* and *The man is a painter*; where the predicate *walks* expresses something which the man does; the predicate *is beaten*, shows what the man has done to him, or, in grammatical language, what the man suffers; and the predicate *is a painter*, shows neither what the man does, nor what he suffers, but simply what he is. We thus get three kinds of predicates, — predicates of *doing*, of *suffering*, and of *being*. Predicates of doing are easily shewn to consist of one or more words expressing an action done, and called *verbs*; predicates of suffering, of two or more words expressing an action suffered, and also called *verbs*; and predicates of being, of two or more words, one of which at least is a word expressing being, called a verb, and is joined to another word which may be either a noun, a pronoun, an adjective, or an adverb. Examples to be used here, are such as, *James is a boy*, *James will be good*, *It is he*, *He has been here*. A verb is thus shewn to be a word expressing doing, suffering or being.

Having now become acquainted with the noun, pronoun, article, verb, adjective, and adverb, we should next proceed to the consideration of the kinds, persons, numbers, and genders of nouns and pronouns; and of the voices, persons, numbers, tenses, moods, and kinds (regular, irregular, and defective,) of verbs. With regard to voice, it will only be necessary to state that the verb in a predicate of doing is in the active voice; and that in a predicate of suffering, in the passive voice. Of the moods, those only will at this period be referred to, which are used in sentences such as those with which we now have to do, viz., the indicative, potential, imperative, and infinitive, and the participles.

In all this, care must be taken to introduce each point to the pupil by suitable examples, deducing the facts or principles to be learnt from those examples, and then, and not till then, furnishing him with the technical terms in which the facts and principles are embodied. If this course be strictly adhered to, it will be found to give an interest to the subject, which can be imparted to it by no other method of treatment. The pupil is as it were, investigating for himself, the teacher only serving as a guide, and bringing before his notice the different things to be learned in the most natural and advantageous order. The examples given are made to serve the purpose for which experiments are employed in the teaching of chemistry and other branches of natural science. Indeed, they have, in one respect, an advantage over such experiments. Chemical experiments will most frequently present things to the pupil's observation, which are quite new and strange to him; he would probably not have been able to contrive them for himself. But such sentences as those used above for examples, he is continually employing every day and hour of his life. In other words he has already, from the practical acquaintance which he has obtained with his own language, an implicit knowledge of very many of the principles and facts to be learned, which has only to be rendered explicit and fixed in the memory, by his attention being properly directed to those principles and facts, and his being furnished with suitable technical terms.

Every step must be not only illustrated and made clear by numerous examples, but the teacher must make sure that his pupil has thoroughly grasped what is presented to his mind, by causing him to perform numerous exercises, requiring him to analyse a number of sentences such as those given above, and to parse each word as far as his knowledge goes. A similar remark will apply to the whole of the course here described.

Having made these remarks, we will proceed with the sketch of our proposed course. We now come to deal with sentences, consisting of other parts in addition to the simple subject and predicate. We shall employ such examples as *John tears the book*, *John killed it*, *Peter wishes to read*, *They have made Henry King*, etc.; by which we shall shew what is meant by the Direct and Indirect Objects, and of what parts of speech each of these may consist. We are also now in a position to explain the difference between the nominative and objective cases, and to

classify verbs into Transitive and Intransitive. The next step will be to show, by proper examples, how the subject or the object may be *enlarged* by an adjective or participle, a noun or pronoun in apposition, or a noun or pronoun in the possessive case. When we have in the same way made the pupil acquainted with the several modes in which predicates are *extended*, we shall have pretty well completed our survey of simple sentences, consisting of what Dr. Morell calls elements of the first degree.

The pupil will next be introduced to the consideration of sentences, some of the parts of which consist of phrases, or elements of the second degree. He will be shewn that all phrases may be classified into three kinds, the noun, adjective, and adverb phrases according to the part of speech whose function in the sentence it is capable of performing. He will also become acquainted with the preposition, a part of speech which only occurs as a constituent part of a phrase.

It will be unnecessary to state at any length the way in which the method is applied to the consideration of complex and compound sentences. This will be sufficiently evident from what has gone before. The pupil must be led to observe how they are analysed into the simple sentences of which they are made up the distinction between subordination and co-ordination must be brought out; and the component simple sentences must be classified, like phrases, into noun, adjective, and adverb sentences, according to the function they perform when considered as parts of the principal sentence. It is in this part of our course that we shall first meet with conjunctions, and with the conditional mood of verbs.

Our method is evidently based upon what is called *Analysis of Sentences*, and instead of the uses and functions of different kinds of words being learned, as in the synthetical method, from bare definitions, they are deduced from an intelligent consideration of the structure of the sentence, and thence of the relations existing between its different parts.

The reader will of course understand that many variations in detail might be made in the course above sketched out, without in any way sacrificing the analytical method upon which it proceeds. It will be found of great importance to cause the pupil to work out numerous and well graduated exercises. In fact, he should analyse and parse as constantly as he is made to do *sums* in his arithmetical course.

Two principal objections have been made to the use of the analytical method, as a basis of a first course of instruction in English grammar. In the first place, it has been urged that it mixes together two different subjects, viz., analysis of sentences, and what is ordinarily understood by the term grammar, and thus distracts the attention of the child, by requiring him to learn two things at the same time. This would be a very serious objection if there were any valid foundation for it. Our answer is simply that those who look upon analysis of sentences and ordinary grammar as two separate and independent subjects, are altogether in the wrong. They form, when rightly considered, but one whole; so that it is impossible to teach the latter, without, at least implicitly and blindly, recognising the principles and facts which it is the province of the former to investigate. Does not, for instance, a comprehension of the meaning of such terms as nominative case, and objective case, necessarily involve an understanding of what is meant by the subject and object of a sentence, although the words subject and object may never have been used by the pupil? Does not, again, a comprehension of the office of the adverb, as expressing the time, place, &c., of the action indicated by the verb, necessitate also a knowledge of what is intended, when we speak of the extension of the predicate? And can the pupil possibly tell what noun or pronoun the finite verb agrees with, unless he is able to discover the subject of that verb? In fact, it is impossible to *parse* without implicitly *analysing*. This objection then falls to the ground.

But, in the next place, we are told, the analytical method burdens the memory of the pupil with an additional set of technical terms; the study of grammar already involves the

learning of a large number of technical terms, and it will be by no means a good plan to add to this difficulty by the introduction of new ones. It is a sufficient answer to this objection to point out how very small is the number of new technical terms introduced. They might almost be counted on the fingers; we have—simple, complex, compound, subject, predicate, object, direct, indirect, enlargement, extension, principle, subordinate, co-ordinate. These are positively all that can be considered as essential. And it must be further observed that these words serve, like all technical terms, to fix and give precision to the ideas which they represent, and therefore render the acquisition and retaining of the subject so much the easier, and the knowledge of it so much the more thorough and lasting. This is indeed nothing but the object and use of all technical terms. So that the knowledge of the principles of analysis being, as we have shewn above, necessary for the study of the remaining portion of grammar, these technical terms must simply be looked upon as so many aids in the attainment of such knowledge.

Our conclusion, therefore, is, that a first course of instruction in English grammar should be analytical, and should be directed mainly to the thorough comprehension of the *general principles* of grammar, and the *principal* facts to be learned in connection with that of the English language. This analytical course will be naturally and necessarily succeeded by the usual synthetical treatment of the subject, by which more detailed facts may be filled in, and the pupil's knowledge systematized and fixed in the memory.—*Museum and English Journal of Education.*

W. M.

English Composition.

Throughout the whole range of educational discussion there is, at the present time, no question more importunately demanding investigation than this:—How should composition be taught in our schools and seminaries, our academies and colleges? It is safe to say that in no other department of instruction is there equal deficiency and failure; in no other department is there equal ignorance of what a proper mode of teaching and learning is; in no other, is there equal dissatisfaction with results on the part of both teacher and pupil. Yet if the culminating object and aim in intellectual culture be power to think and to speak and write correctly and effectively, that department of instruction which aims directly at the development of this power should outrank all others in importance.

Composing is as properly an art as is ciphering. It is, to say the least, as difficult an art; and, certainly, if the true end and object of all education be kept in view, it must be admitted to be deserving of equal care, time and labour—equal consideration every way on the part of teacher and pupil. What now would be thought of a system of education which should treat ciphering—arithmetical computation, as composition-writing is generally treated in our institutions of learning, higher and lower? Suppose in our schools the requisition should be given out, without any preparatory instruction, without a hint or suggestion otherwise, than that every pupil should on every Wednesday afternoon, or on the Wednesdays of alternate weeks, present a ciphering.

Pupils that had witnessed such spectacles before,—the others would probably be excused at the first performance,—might have, we may conjecture, a shadowy notion of what was intended in the requisition. Such, we may suppose, if at least they were faithful and eager to learn, would come, after racking their brains through all the leisure hours of the week, and torturing parents, brothers and sisters at home, and older fellow-pupils at school, on the dreaded Wednesday afternoon with a ciphering to be exhibited. The older performers would present, a long sum in division; and the younger would hope to satisfy conscience and the teacher with some rows of figures well-formed and properly arranged. The ciphering papers after having been read amid the blushes, the tremblings, the falterings of the performers, should be gathered up by the teacher to be scrutinized, corrected, and marked

in respect of merit. The corrections should consist of some marks of a pen or pencil to the effect that this figure is not perfectly formed; that a sign of subtraction is omitted here, or the wrong sign for addition placed there; that here the horizontal, and there the perpendicular row of figures is not straight and true; that this figure is placed one degree too far to the right, and that, one degree to the left; that the sum of these two figures, or the difference between those two is not correctly stated; and should be indicated through some conventional sign, on the ciphering papers, and then be returned to the pupil with no further word of instruction or explanation. Suppose the whole course of instruction, from beginning to end, should be made up of these Wednesday afternoon presentations and these pencilled criticisms. What kind of arithmeticians should we expect from such teaching and training? Would utter disgust with the whole procedure be strange or unreasonable? And yet is this any caricature of composition-teaching in many, if not in most schools?

In some cases, it is true, the teacher tries to do something more. A theme is proposed, or a list of themes from which one is to be selected by the pupil. This would be perfectly paralleled in teaching arithmetic by the teacher's giving out a line or lines of figures on which the pupil should cipher and bring in at the Wednesday presentation, ciphering papers with these figures worked out—nothing being indicated as to any process or any result; whether the figures are to be added or subtracted; whether multiplied or divided, or what was definitely to be done with the figures. In fact, as to any previous teaching in any way, the pupil should be left in utter ignorance of what multiplication or even addition is, or how to be performed. His task should be not to add specifically, not to multiply, not to compute interest,—not to perform any arithmetical process in particular, much less attain any result as the amount due on a promissory note bearing interest, or the cost of commodity at so much a yard, or pound, or bushel; but only to bring in a ciphering paper. This paper must have a certain number of figures on it perhaps; the figures must be well formed, well arranged; if addition or division is ventured on, the sum or the quotient must be placed below or at the right hand, and the signs must be correctly placed. But any process is admissible, and no criticism or instruction as to the nature of the process should ever find entrance into the method of teaching. This is no caricature of a mode of teaching composition when more than ordinary care and interest are taken in it by the teacher. Is it strange that the writing of compositions is turned away from in disgust and inexpressible aversion? That in the views of so many judicious teachers the practice should be condemned and reprobated?

Composing is as perfectly an art as ciphering,—as computation. As an art it necessarily implies that something is to be done under intelligible guidance; something to be done in some rational way that can be pointed out. As an art it admits of guiding principles and rules that must regulate the whole procedure in order that it may be successful;—in order that what it proposes to have done, may be done well. Like ciphering, composing is an art, that, as applicable to a great diversity of uses, embraces a great diversity of processes. These processes are widely diverse from one another, as much so as are addition, subtraction, multiplication, and division, as are evolution, involution, reduction of fractions, computation of interest, mensuration of surfaces and solids. It is just as irrational to attempt to teach composition as to teach arithmetic simply by assigning general exercises without indications of the precise object to be accomplished and of the nature of the particular process by which that object is to be attained.

It is just as irrational, thus, to require from every pupil on each alternate Wednesday a composition without further specification as to the object of the essay, and with no instruction as to the processes to be applied as it would be to require a ciphering exercise without such specification and instruction, and with the expectation that alike in each case the pupil is to acquire the

art simply by such a method. It is just as irrational to prescribe such a composition exercise even with the additional help of an assigned theme as it would be to give out an exercise in ciphering with only an assigned line of figures to cipher upon, and with no further teaching as to object and process. In the acquirement of every art, as in all human culture, there is an indispensable condition prescribed in the very nature of the human mind as subject to *growth*. The mind begins in infantine weakness, and by slow and successive degrees only attains to full and perfect maturity. All right teaching, every successful teacher must intelligently adopt this fundamental principle of growth and the method which it imposes.

The pupil must be borne along from the simplest element of the art, step by step, one element at a time—in a steady unfolding of the art, to the goal of a perfect attainment of it. To effect this, the teacher must know the path from the starting point to the goal, must intelligently keep his pupil in this path and adapt his teaching to each successive stage of progress. The prevalent mode of teaching composition ignores and tramples on this fundamental law of culture. It knows no beginning, no ending; no starting point, no goal. The beginner and the proficient are assigned the same exercises and receive the same instruction, whether it be preparatory, if indeed any such instruction be given at all, or whether it be in the way of criticism and correction of exercises already finished by the pupil.—*American Journal of Education*.

(To be continued.)

Practical Lessons.

Words derived from names of places. (1) *Peach* is derived directly from the old French *pesche*: the Italian name is *pesca* or *persica*; Spanish, *persigo*; Latin, *persicum*, i. e. Persian. *Nectarine* is itself a Persian word, meaning "the best" kind of peach.

The *chestnut* is often improperly spelt *chesnut*, as if it were the cheese-like nut. But the mute *t*, which could never have crept into the word, whatever may be the danger of its ultimate disappearance, is valuable as an indication of the true etymology, as well as of the country in which the tree was indigenous. The French *Châtaigne*, and still more plainly, the Italian *Castagna* and the Dutch *Castanie* point us to *Castanæa* in Thessaly as its native place.

Walnut has nothing to do with walls. It is properly the German *Walsche nuss*, the nut from *Walschland* or Italy. [*Walsch* or *Welsh* is from the Sanskrit *mléçh*, and properly signifies "a person who talks indistinctly, a jabberer,"—i. e. a foreigner: *barbar*, from which we get *barbarian*, had a similar meaning. We have the same word in *Wales*, in *Wallachia*, *Walloon*, the *Canton Wallis*, *Cornwall* etc. A *Walros* or *Walrus* is a strange horse: a *whale* (German *Wallfisch*) is a strange fish; and in German, a turkey is a *Walsche Hahn*.]

The word *quince* preserves only a single letter of its original form. The English word is a corruption of the French *coing*, which we may trace through the Italian *cotogna* to the Latin *cotonium* or *cydonium malum*, i. e. the apple of *Cydon*, a town in *Crete*.

The *Jerusalem* in *Jerusalem artichoke* is a corruption of the Italian *girasole* or *turnsole*, i. e. sun-flower, as being one of the plants which always turn its flower towards the sun.

The *shalote*, a species of onion, comes to us from *Ascalon*, as will appear, if we trace the name through the French, from *échalotte*, and the Spanish *escalona* to the Latin *escalonia*. The *Charlott-Russe*, therefore, or still more absurdly, *Charlotte de Russe* of the pastrycook's *carte*, albeit containing onions no longer, should be *échalotte Russe*.

"There is an herbe," says an old voyager, (1) "which is ser-

ved apart by itself, and is called by the inhabitants *upporoc*; in the West Indies it hath divers names, according to the several places and countries where it groweth and is used. The leaves thereof being dried and reduced to powder, are used, taking the fume or smoke thereof, by sucking it through pipes made of clay into their stomacke and head." The general estimation in which the growth of *Tobago* was held has caused the name of this island to become the general designation of the "herbe."

"*Mohair* or *moire*, is a fabric of the Moors or Arabs of Spain; and the same skilful race after the Spanish conquest, manufactured *Jean* at *Jaen*; and at *Cordova*, *cordovan*, or *cordwain*, a kind of leather prized by the *cordonniers* or *cordwainers* of the middle ages, as highly as *morocco* is by the leather-workers of the present day. Truly, the most elaborate history of the civilization of the Arabs, would fail to give us any such vivid sense of their industry and ingenuity as is conveyed by the curious fact, that the seats of their empire, whether in Africa, in Europe, or Asia, have stamped their names indelibly on so many of the fabrics in our daily use.

"As the energies of the Moslem races decayed, the Flemings took their place as the chief manufacturing people. When *Leeds* and *Manchester* were country villages, and *Liverpool* a hamlet, *Flanders* was supplying all Europe with textile fabrics. The evidence of this fact is interwoven into the texture of our English speech. We have seen that many silk and cotton fabrics were from the Arabs; The Flemings excelled in the manufactures of flax and wool. From *Cambrai* we have *cambric*. *Diaper*, formerly written *d'ipre* or *d'ypres*, was made at *Ypres*, one of the chief seats of the cloth manufacture.

"Another colony of cloth workers was settled on the river *Touques* in *Normandy*. From the name of this river we derive a whole family of words. In German the general name for cloth is *tuch* and in old English *tuck*. We read in *Hakluyt's voyages* a description of "the Great Turk himself," who had "upon his head a goodly white *tuche*, containing in length by estimation fifteen yards, which was of silke and linnen woven together resembling something of *Calicut* cloth (*calico*)." White trousers are made of *duck*, our beds are covered with *ticking* and our children wear *tuckers* at their meals. A tucker was originally a narrow band of *Linen* cloth worn by ladies round the throat. Hence any narrow strip of cloth fastened on the dress was called a tuck or tucker, and when this mode of ornamentation was imitated by a fold in the fabric, the fold or plait itself received the same name. A weaver used to be called a tucker and Tucker is still a common proper name among us.

"From the *Walloons* we have *galloon* i. e. *Walloon* lace, as well as the finer fabrics which take their names from *Valenciennes* and *Mechlin*. From the same region comes *Lisle* thread the rich tapestry called *arras*, and *Brussels* carpets. The manufacturing capital of *Flanders* was *Ghent*, *Gand* or *Gaunt*. [John of Gaunt was John of *Ghent*.] Hence the French word *gant*, a glove, and the English *gantlet*. In the marshes of *Holland* the fabrics were of a less costly type than among the wealthy *Flemings*. From this region we obtain the names of *Delft* ware, brown *Holland* and homely *frieze*, or cloth of *Friesland*."—*Ed.*

Questions for Grammar School Teachers.—We should be glad to receive answers from our readers to any or all of the following questions:

1. What percentage of the whole school-time is spent by your pupils in the study of English grammar?
2. What portion of this time do you consider profitably spent?
3. What do you think the proper age for beginning the study of grammar?
4. What percentage of time is spent on the study of arithmetic? of geometry? of natural philosophy?
5. Would it, in your opinion, be practicable to introduce into the course of Grammar-School study, the simple principles of plane geometry, with their practical applications, and the simple principles of physical science, if the time now devoted to

(1) We take our lesson almost entirely from that interesting English work, Taylor's "Words and Places."—*Ed.*

(1) Harriot "Brief and True Report of the new found land of Virginia."

the study of grammar and arithmetic were curtailed? And could not text books be constructed that would exercise the pupils' minds in arithmetical calculation in more profitable and practically useful directions, especially in connection with mensuration and natural philosophy, than is done by the present ones?—*Ed. Massachusetts Teacher.*

Teachers' Annual Convention.

(From report of the *Montreal Witness.*)

The Fourth Annual Convention of Teachers, in connection with the Provincial Association of Protestant Teachers of Lower Canada, was held in Montreal on Friday and Saturday, 18th and 19th October.

The attendance of teachers and friends of education was but moderate.

Principal Dawson, the President of the Association, occupied the Chair; and on the platform were the Venerable Dr. Leach; Professor Miles, D.C.L., Secretary of the Board of Education for the Province of Quebec; Mr Scarlett, delegate from Ontario Provincial Association of Teachers; Professor Wilkie, Principal of the High School, Quebec; Professor Howe, High School, Montreal; Professor Hicks, Professor Robins; Mr Hubbard, Inspector for the District of St. Francis; Professor Darcy, Secretary; and Mr A. C. Williamson, Secretary of the Local Association.

Proceedings were opened with prayer by Rev. Dr. Leach.

After some discussion relative to the establishment of a teachers' journal and the possibility of forming one teachers' association for the whole Dominion of Canada, the Chairman introduced to the notice of the meeting a paper by Prof. Roux on what might be called civic education, or the teaching of their rights and duties to scholars, in view of their position as future citizens which elicited some discussion.

Dr. Leach held that a system of school education should include some simple instruction in the moral duties, and also, to some extent, in jurisprudence. He had no doubt that these branches would yet be made parts of a common-school curriculum.

Prof. Robins complained of the want of a text-book for such teaching.

Prof. Hicks considered that the subjects already taught were so numerous that time could not be found for these subjects. He asked, were they not now taught indirectly in connection with history.

Prof. Howe deemed that, in common schools, arithmetic and writing were of more importance than moral philosophy and jurisprudence. He would leave these latter to the college, and the more advanced institutions meant for students of a riper age.

Prof. Robins remarked that now-a-days the newspapers were great instructors, both in morals and jurisprudence.

Dr. Wilkie coincided in the general idea of giving instruction in these, and thought it was desirable to have a sort of catechism thereon prepared, even for the use of teachers themselves; such catechism to treat not only of government in general, but to teach them something of the changes in the spirit and form of the Government of Canada, from its arbitrary manifestation in the days of Dalhousie and Craig to the present time, when we enjoyed a responsible Government, and a freedom of which all might be proud.

Prof. Hicks wished to know whether it was proposed to teach political economy.

Prof. Howe said this was a proposition to add another subject to those taught in the school, at the very moment when there was a cry for the shortening of the school-hours.

Mr. Scarlett thought, if the people were indoctrinated at school with the first principles that lie at the root of government, there would be less foolish wrangling and ill-feeling at elections. He thought that such a catechism or book as had been spoken of would be a gain to the country. He thought, also, that an inculcation of the principles of morality should lie at the root of all education.

Prof. Howe did not think the school was exactly the place for a special teaching of morals.

Mr. Featherstone said they did already teach morals there; but to introduce anything like moral philosophy into the small schools could not be done.

The President then reviewed what had fallen from the speakers on the question. He himself thought that such a teaching in schools respecting the constitution both of Britain and Canada was feasible with the more advanced classes, and in the High School. It was desirable that the minds of the scholars should be directed to the subject of morals, also of government. He would like to see a

manual prepared for this purpose, especially if it were written in good English, which was not the case with all their text-books.

The discussion of this topic was then declared to be closed.

Prof. Hicks introduced the next question as to the length of school-hours. It was, he said, engaging attention in England, where there was a tendency to shorten the daily hours of school from six to three or four. He objected to this. They could not teach all their present subjects and yet shorten the hours. Indeed, if teaching were properly conducted, children would like to be in school better than out of it. In large cities and towns, the chances were that when the school was thus early over, the children would be in the streets, learning only evil.

Prof. Howe held with Quintilian, that children could receive instruction only at a certain rate. The mind, as Quintilian had long ago observed, was like a narrow-necked bottle,—if it was attempted to be filled too fast, the liquid only ran over and was wasted. He (Prof. Howe) did not think five hours a day too much for boys of fifteen or so.

Mr. Hubbard thought the shortening of the hours would be detrimental in country schools. Education was not altogether pouring into the mind. It was also a straining up of its powers.

The President reconciled the somewhat conflicting views of the last two speakers.

Dr. Leach gave the result of some experiments, showing how long the earnest attention of a child might be secured. It was about ten minutes.

Prof. Howe—No teacher ought to expect strained attention from a child.

Mr. Hubbard showed that six hours' tolerably close attention might be obtained in one day, if the subject were properly varied.

Prof. Robins contended that, in considering the shortening of hours, they must look to the different ages of the children, and must make a corresponding difference in the time of their remaining in school. He had taught the alphabet at the rate of only one letter a day, and found the whole was thereby acquired with greater certainty and rapidity by the child; and arithmetic would be taught with greater rapidity if the quantity were graduated to the amount of attention that would be given. He had also found, when teaching a common school, that he could give a good deal of instruction in geography and in morals, in five minutes, without the aid of any text-book. He had sometimes spent a forenoon thus, but oftener half an hour or a quarter; and these short lessons to which he had referred, had an incidental advantage, in that they taught the child to pay attention. The advocates of shorter hours in school did not want to curtail the time of learning to five hours, for it must be remembered that much solitary study was done at home. The lessons themselves ought to be short. He did not think that what the scholar got in school was really the most important part of what he learned. The time and the attention of the scholars were too much frittered away in *minutiae*, instead of being engaged in learning to take broad, general views.

Mr. Scarlett had known the best effect arise from the plan of proportioning the school-hours in accordance with the ages of the scholars, even in the same school.

The discussion lapsed into a desultory conversation, in which it seemed to be generally agreed that the amount of attention that could be secured from pupils ought to govern the length of lessons.

Prof. Howe suggested that, instead of shortening the hours, half-holidays should be given more frequently.

The President reviewed what had been advanced during the discussion. All the points of school reform which had been touched upon were being taken up in England and in the States, where society were beginning to wake up to the idea, that instruction in things which belonged to the business of life was not given in schools. The consideration of this matter was therefore forced upon teachers; and if they would say, we will not budge, we have got all that is necessary for teaching, both in subject and form,—them in ten years, they would all be swept away.

Prof. Robins then delivered a dissertation on the teaching of elementary arithmetic. It was philosophical, and showed a searching attention; not content to take things upon trust, or to receive illustration as a substitute for proof. Prof. Wilkie coincided with Prof. Robins; and the same ideas had also struck him as to the unsatisfactory nature of the text-books in treating of rudimentary arithmetic.

Mr. Williamson was afraid that Prof. Robins' plan, of going into the first principles of these things connected with the science of calculation, would be too abstract for children.

Mr. Scarlett thought children were hurried through the rules of arithmetic, and that it was not taught with sufficient profoundness.

The President adverted to the improvements in teaching it since the time when he was a scholar. Calculation was naturally pleasant

to the mind, and he thought obstructions had been thrown in the way of the child's acquiring it.

The afternoon session then closed.

EVENING SESSION.

At the evening session, which was well attended, Principal Dawson, the President of the Association, again presided; and the piece, "Flow Softly, Thou Murmuring Stream," Prof. Fowler himself presiding at the piano, was rendered in capital style.

The President then rose and said; this was the fourth Annual Convention of the Provincial Association of Teachers. This Association had been formed, not with a view of interfering with the local associations, but with the view of gathering together all these associations, at least once a year, into one meeting, where the teachers might take counsel of each other. It might still be regarded as only in its infancy, but it had already done considerable good in the promotion of education. They stood in a peculiar position as the Association of the minority of the Province. For his own part, he would like better if they had an association that included all the educational people of all the religions and nationalities in this Province; but for the present they must be content to meet separately, bearing in mind that, though the minority, they professed to be a spirited, active, and progressive minority. The fact that we formed such an association added to our responsibility, and it was our duty to carry on a friendly rivalry with those who are working separately.

In such an Association as this, they had evidence that education is a progressive art. If it were not so, there would be no need of coming together to confer with respect to it. It was an art which was yet far short of perfection, though it had improved wonderfully since the great awakening of the Middle Ages. As all the arts, sciences, and literature are constantly improving, why should not education be also advancing? If any class of men should be in the way of improvement, it ought to be the educators. They represented not the generation that now is, but that which is to come; and if that was to be in advance of the present, with higher duties and responsibilities, and against a more active competition, it became educators to see that they were not behind the age, but in advance of it, if possible. There was pressing upon education at this moment a most important question, which they were yet hardly prepared to solve. It was clear that, at the present day, those methods which had been sanctioned by long usage in schools must bear a hard and severe criticism. They must make up their minds that the public expect that the young people educated to-day will be ready to enter upon the battle of life to-morrow. When so many new arts and sciences were continually rising up, with which the young must become more or less acquainted, it was necessary that more should be taught in schools than was taught there in times gone by. It was of no use for them to tell the people that the average intelligence of men had not improved; they still required just as much to be done in the education of their children. How this new and great addition of subjects was to be joined to the usual course was a question that had not yet been solved in this country. They had come to the Association, not to build themselves up in old ways, but to inquire what, as professional teachers, they could do towards solving these difficulties. With this in view, the programme had been drawn up by some of the oldest teachers, who felt these questions pressing upon them.

With respect to the question of the length of time that ought to be spent in one day in school, some people thought that it was a question settled of old, that children should spend just so many hours there. The question had not been settled of old, for it was now being agitated, what was the proper time and length of school-hours, and no regard should be paid to old customs as such. Then there was the question of what ought to be taught in schools, and how many different subjects should scholars study. Some people seem to think that they should teach everything. One says, children ought to spend five or six years in Latin and Greek. Another wants mathematics to be the principal study; and another thinks the arts and sciences are the only important branches of learning. The programme showed the variety of subjects demanding attention, some of which were difficult to decide upon. For instance, there was the question of home-lessons, which some were greatly in favor of. But the parents, quite likely, would say that such a thing would never do. They could not have the trouble of hearing their lessons, and, besides, they should have all the time out of school-hours for physical exercise. Then there was the question of "the education of taste," which, he thought, was almost ridiculous to put in the programme. In old times, it was considered that the taste was best educated in one of the most wretched and dirty places possible, so that the children might learn to love their home more, by contrast with the schools. They were simple prison houses, quite unfit to be occupied. Under such circumstances, the education of taste was a kind of negative education. But now new ideas had

come up, and the school-house must be an agreeable place, well ventilated and comfortable, with pictures and flowers. But a serious difficulty here arose, and that was the cost of those improvements.

The speaker then gave an account of the origin and working of Teachers' Institutes. They were originated in New England, and from there he had introduced the plan into Nova Scotia while he was Superintendent of Education for that Province. He hoped the Convention would pass a resolution, recommending to the educational authorities of this Province that something should be done towards establishing Teachers' Institutes. In conclusion, he would say that, as we were now entering upon a new phase of political life, whatever might be the result of it in a political point of view, they must endeavor to act, so that this Province of Quebec might not be last or least in the advance of education.

The glee, "Crabbed Age and Youth," was then sung.

Dr. Carpenter now delivered a brief address on sanitary work in relation to schools. He said he had been requested by the Sanitary Association to take the present opportunity of speaking upon the above subject, which he would treat under the heads:—1st, of the sanitary condition of schools; 2nd., the teaching of the simple rules of health in school.

He then showed that school-rooms were seldom fitted for their purpose; and insisted upon the duty and positive necessity of making them healthful. Better, he said, to have no education than to have it under such circumstances. Defective ventilation and imperfect drainage were especially to be guarded against. The speaker also described a simple plan, which he had adopted in his own school, for admitting fresh air during the winter, without inflicting a draft upon the scholars. He also recommended, as a safe expedient, the sending of the scholars out for five minutes, and, in the meantime, throwing doors and windows open to effect a rapid and complete change of air; the heated state of the walls, floor, and ceiling, preventing any ill effect, by soon restoring the atmosphere to its original temperature.

As to the rules of health, nothing, except religion, could be of greater consequence; and these rules ought to be taught in all schools, either orally or by means of text-books. He would call the attention of those present to a little English work, a copy of which he held in his hand, styled, "Health made easy for the people;" and which, he thought, it would be well to have translated into French, or else to have another written in accordance with it. This was about the best text-book on the subject; and the subject itself was one which could not be neglected, but must be studied until the sanitary means best adapted to the conditions of our climate, &c., were discovered and adopted.

Mr. Andrew, of the High School, then gave, as a humorous reading, Shakespear's immortal Dogberry, from "Much Ado about Nothing."

This was rendered with a discrimination of character and gusto of humor that provoked the audience—principally ladies—to a continued titter; while the grave Professors, in spite of superhuman attempts at immobility, solemnly and under compulsion, shook their sides in concert; and even the critical and too often censorious reporters nodded to each other their approval.

Prof. Miles, read a paper on education in and out of school; in which he dwelt on the vast importance of parents co-operating with the teacher, by home moral training, and in securing the study of the lessons at home also, in up holding, by parental authority, the authority of the teacher whenever improperly resisted or called in question. He thought that, under the present system, the mind of the scholar was often overburdened. Corporal punishment and expulsion from the school were, in some instances, too much resorted to for refractory scholars, but this had the effect of lowering the tone of the school. Evil external influences, and the coming in contact with vice and folly out of school, would neutralize the best teaching.

The speaker then made some extemporaneous remarks. In so doing, he observed that his appointment to his present post in the educational department of the Local Government, evinces a desire on the part of that Government, to introduce the Protestant element into the educational economy of the country. For this, much was due to the exertions of Messrs. Galt, Cartier, Rose, Dunkin, Pope, and Chauveau. The last-named gentleman had on many occasions expressed to the speaker his desire that all reasonable things should be done for us. He had also charged him to say to them that his necessary absence from the Convention, that evening, was a source of regret to himself; also that these Associations had his cordial approval. These sentiments of Mr. Chauveau's were participated in by the new Superintendent, Dr. Giard. The speaker, for his part, would do his best in his new position. He asked for all forbearance on the part of his Protestant brethren; whose interest as a minority could never be promoted by being dictatorial or putting forward unreasonable demands, or in interfering with others.

They must strive to excel in the amount and character of their own educational efforts, and not attempt, by bullying or getting up grievances or hanging perpetually on the skirts of government, to slide at once into the position of their more numerous older-established and more wealthy fellow citizens of another creed.

Mr. Scarlet read a paper on the importance of school education in general; especially, in this country, of a thorough system of common school education, which was the best of all means for fusing our population, consisting, as it did, of various races and creeds, into one nationality. He also showed the great importance of meetings such as the present, from which no true teacher would, if possible, be absent.

The President concluded the proceedings by saying, he thought the gentlemen who had addressed them that evening; also the gentlemen and ladies who, under the leadership of Mr. Fowler, had entertained them with music,—merited their warmest thanks. As to Mr. Andrew, he must take this occasion of publicly acknowledging not only how much that gentleman had done for the art of reading in this city, but also—by means of his pupils in elocution, who had been sent out from the Normal School—in introducing the art of reading into our country schools in a better way than had ever been done before.

The meeting then broke up.

SECOND DAY.—MORNING SESSION.

Saturday, Oct. 19.

The Convention met this morning for the despatch of business at a quarter past nine, and was opened with prayer by the President, Principal Dawson.

The minutes of the last session were read and approved.

The Executive Committee reported in favor of holding the next annual convention in the St. Francis District, and that the Secretary communicate with the officers of the District of Bedford and the Quebec Associations, with a view of holding the Convention in those places in future years. The report of the Committee was adopted.

The election of a President for the ensuing year being next the order of business, the President suggested that such officer should be a resident of the district in which the Convention was to be held.

Mr. H. Hubbard, Inspector of Schools for St. Francis District, suggested the Hon. J. S. Sanborn, of Sherbrooke, for President. Mr. Sanborn was accordingly elected.

Archibald Duff, jr., B. A., was elected Secretary; and James McGregor, B. A., Treasurer.

The President said that the time of holding the Convention had better be left to the Executive Committee, in conjunction with the local association of the district.

Prof. Robins, Mr. Hubbard, and Mr. Wilkie were elected delegates to the Teachers' Association of Ontario, to be held in Toronto on the first Tuesday of August, 1868.

Upon motion of Mr. Hubbard, the name of the Association was changed to that of the "Province of Quebec."

A letter was handed in to the Chairman from the Hon. T. D'Arcy McGee relative to the establishment of Evening Schools, expressing the writer's regret that he was unable to be present at the meeting and suggesting that the subject of his letter was worthy of their attention. After some discussion Mr. McGee's letter was referred to a committee.

The President said he had received a letter upon a very important subject, which the writer wished to have brought before the Convention; namely, the introduction of sewing as a part of the education of common schools.

Prof. Hicks thought the discussion should be opened by a lady.

Prof. Robbins believed that the art was already taught in the McGill Model School and in some of the French schools.

The President said we should be reduced to a distressing condition if the art should become obsolete. There was no question but that it should be taught, at some period, to young women of all ranks of life. The subject was then allowed to drop.

Mr. Barnjum, Professor of Gymnastics, then came forward with eight young lads, whom he stationed on the platform prepared for the purpose. He then made some remarks upon the importance of gymnastics in schools, and the advantages derived from putting young pupils through a course of exercise that would counteract the tendency among them towards round shoulders.

The boys were then put through a variety of most skilful exercises with and without dumbbells, keeping perfect time in all their motions, to music furnished from a melodeon. The exercises were frequently applauded.

The President said Mr. Barnjum had shown himself to be a real genius in his profession.

In answer to Prof. Miles, Mr. Barnjum said that most of the motions

exhibited were nearly or quite new. The boys did not become fatigued, because the music supplied a stimulus which exhilarated the mind. In answer to another question, he said that boys in their natural plays out of doors did not go through nearly so many and so useful motions as the course just exhibited afforded. Probably half an hour a day of free and pleasant exercise was sufficient. He was decidedly of the opinion that these exercises promoted the health and mental strength of the pupils, so that they could study better and learn faster. Considerable discussion followed upon the manner of teaching gymnastics to ladies. Mr. Barnjum said that it was absolutely necessary that, while going through such exercises, they should be entirely free in every motion,—necessitating a total change of dress.

Upon the subject of Teachers' Institutes, Mr. Hubbard said that the principal drawback to the benefit of the Associations was their necessary shortness, preventing any thorough discussions of a single subject. This difficulty would be remedied by a Teachers' Institute, where teachers could go and be put through a regular course of training, extending over several days. What was needed was greater attention paid to details; and this could not be done in Associations like the present one.

Mr. Scarlet, of Ontario, gave an account of the different modes employed in that Province to secure training to teachers. Associations had been very successful there, so much so that he would not recommend any teacher to trustees who did not attend such associations.

Prof. Hicks said that in England, the plan was adopted of sending out, by the National Society, a person thoroughly conversant with teaching in all its details, who would gather, at some central point, all the teachers in the vicinity, and instruct them for several days upon the methods of teaching.

Prof. Robins said, he was of opinion that it had become necessary to withdraw a small portion of the grants to common schools and apply it for the purpose of sustaining Teachers' Institutes and for a still more thorough inspection of schools. There were many ways in which the government money might be more efficiently expended than it is at present.

Prof. Hicks thought that a better use to put money to than in forming Teachers' Institutes would be to establish pensions for invalid teachers, or for those who had spent their lives in the work and found themselves in old age. At the present rate of compensation, many found themselves in needy circumstances. If a competency were assured them in their old age, many would give their whole time and attention to the profession, and their efficiency would be greatly enhanced.

In answer to an inquiry, Prof. Miles, as a member of the Board of Education, said he did not know yet what changes might be made in the disbursement of money for educational purposes. At present, he thought we should look to the normal schools for the correction of many evils that might exist.

Prof. Duff made some remarks upon the imperfect gradation of schools, or, when that gradation existed, upon the want of conformation thereto. These faults in the educational system applied more especially to the country. Thus, in many cases, academies did the work of common schools; for instance, little children going to academies to learn their letters, thus wasting the time of teacher, who was, or should be, prepared to teach higher branches. A standard of examination should be formed which children should be required to come up to before they were allowed to enter higher schools. There were but few academies in the country which were really doing the work of academies.

Prof. Miles said that such schools as Bishop's and St. Francis Colleges might draw away many boys who might be considered as coming within the scope of academical teaching. One reason of the faults complained of was, that, the country being new, people in general had neither time nor means to give their children other than a common-school education. There was a scarcity of teachers with academical diplomas, and trustees were often obliged to take those who were not properly qualified.

The hour for adjournment coming nigh, the President reviewed the work of the Convention, congratulating it upon the large number of subjects treated of, and the information that had been elicited.

The Convention then adjourned to meet in St. Francis District at a time to be hereafter specified.

SCIENCE.

Photography.

Now application of Photography.—Photography is now being applied to the registration of the pulsations of the heart and arteries, a purpose eminently useful to the physician. The apparatus employed consists of a glass tube, that at one end is widened out into a cone, the base of which is closed with a thin membrane of vulcanized india-rubber. The upper extremity of the tube is inserted into the slit formed in a division placed in a small camera about its middle and at right angles to its length; the slit being capable of being closed or opened at pleasure, by means of a small movable screen. The sensitized plate is made to move with a regulated speed by clock-work. When an experiment is to be made, so much mercury is placed in the tube that it will rise to some portion of the slit, within the camera; and the membrane is laid on the heart or the artery the pulsations of which are to be recorded. Every pulsation disturbs the level of the mercury in the upper part of the tube, and as light can pass to the sensitive plate only through the tube a picture, having an undulating lower margin, is formed.

The sensitized plate moves at the rate of one centimetre per second; but the effect is magnified so that the curve representing it has an extent of fifteen centimetres. The rate and energy of the pulsations of the heart or any artery is, in this way, accurately and satisfactorily recorded.—*Intellectual Observer.*

Chemistry.

Artificial Meerschaum, etc.—Chemistry has discovered a new and interesting use for potatoes and other vegetables, illustrations of which are now to be seen at the Paris International Exhibition. If potatoes be peeled, and macerated for about thirty-six hours in water, to which eight per cent sulphuric acid has been added, well washed with water, dried in blotting-paper, and then in hot sand for several days, on plates of chalk or plaster of paris, which are changed daily, being compressed at the same time, an excellent imitation of meerschaum, answering well for the carver, or any purpose not requiring a high temperature, will be obtained.

Greater hardness, whiteness, and elasticity will be produced if water containing three per cent of soda, instead of eight per cent sulphuric acid is used. And if, after the potatoes have been macerated in the solution of soda, they are boiled in a solution containing nineteen per cent soda, a substance resembling stag's horn, and which may be used for knife handles, etc., will be formed. Turnips may be used instead of potatoes in the production of the artificial horn; and if carrots are substituted for the potatoes, a very excellent artificial coral will be obtained.—*Intellectual Observer.*

EDUCATION.

Gilchrist Educational Trust.

Under this title, there has existed for some years, in England, an institution having for its object the encouragement of education, and the study of the sciences in every part of the world. Owing to the liberality of Dr. Gilchrist, bursaries have been founded to aid in carrying out the idea.

The youth of Canada are called upon to participate in the advantages offered, observing certain conditions contained in a programme to be obtained from the Colonial Secretary, addressed through His Excellency the Governor General.

A bursary of the value of £100 sterling per annum, and tenable for three years, will be granted to every successful can-

didate, a resident of the Dominion of Canada, who will become eligible to compete, and who desires afterwards to pursue an academic course of study in Great-Britain, — the following conditions stipulated:

1. Every candidate must be a native of Canada, or have resided there for five years immediately preceding the examination.

2. Every candidate must furnish to the local authorities satisfactory proof, that he is at least 16, and not more than 22 years of age.

3. Every candidate must also furnish satisfactory proof to the local authorities that his morality entitles him to compete for a bursary.

4. Candidates approved by the local authorities will present themselves for the matriculation examination at St. John's College, London University, which will take place simultaneously at Quebec, Montreal, Kingston, Toronto, Ottawa, Halifax, and in a city, subsequently to be named, in New Brunswick, commencing the last Monday in June under the direction of Sub-Examiners named by the Governor of Canada.

5. The answers of candidates, approved as aforesaid, will be transmitted through the Colonial Office, to the Registrar of the University, who will lay them before the Examiners for correction and revision, and who will draw up a report of the result of the examination; and the bursary will be awarded to the candidate who shall have gained the best notes at the examination, provided he shall have taken "honours," or shall have been admitted to the 1st Division.

6. The decision of the Examiners will be immediately transmitted by the secretary of the "Gilchrist Institution," through the Colonial Office, to the local authorities of the capitals of the colonies, then to be made known to the candidates.

7. The successful candidate must present himself to the secretary of the "Gilchrist Institution" in London, not later than the first week in October following his nomination.

8. Each bursar will have to choose between the "Edinburgh University," and "University College," London, in which to follow his course; but he will be expected to pursue his studies with the view of graduating in one of the four Faculties of the London University.

9. Each bursary will be considered as having commenced from the 1st July following the decision of the Examiners, payable quarterly the 1st October, January, April, and July.

10. Each bursar, each session, shall follow at least three courses of lectures in the institution which he has selected, and shall transmit to the secretary of the "Gilchrist Institution," at the end of each session, a certificate from each of the Professors whose course he has followed, stating that his diligence and conduct have been satisfactory.

If he be unable to procure such certificate, and if it be otherwise proved that his conduct is unsatisfactory, he will be considered as having lost all claims to the payment of the remainder of the bursary.

Each bursar must present himself at the first examination in one of the four Faculties of London—arts, science, law, or medicine, before the expiration of the second academic year, dating from the day when he shall have obtained his bursary; should he fail to present himself, unless excused by the administrators, or fail to pass, he will be considered as having lost all right to the remainder of the bursary. After having passed his first examination, he must pursue his studies with a view of presenting himself for a second, within two academic years.

The foregoing schedule will be subject to revision from time to time, the administrators reserving to themselves the right to modify the conditions of the bursary, or to withdraw it altogether should they judge it expedient. There will, however, be no change made that will affect the interests of candidates already provided with bursaries, nor in any case without previous notice of twelve months.

Education in Nova Scotia and New Brunswick.

We have received the Reports for 1866 of the Superintendents of Education of Nova Scotia and New Brunswick.

The documents are replete with information and suggestions of the most valuable and interesting kind, embracing all such particulars as would be required in arriving at a knowledge of the present state and prospects of education in these portions of the new Dominion—very useful too, at the present time, in affording reliable means of comparison both with respect to Educational matters here and also in relation to the perhaps better known material condition of our maritime fellow subjects.

We have not space for more extended extracts, but those here given will be found interesting to our readers, and we may recur to these Reports hereafter.

NOVA SCOTIA.

TEACHERS.

1. The total number of teachers employed in the winter was 929, and in the summer 1,190, showing an increase for the respective terms of 223 and 237 over those of last year. The classification of the teachers will be found in Table 1.

2. The amount expended in the Province for teachers' salaries during the school year was \$235,825.67, an increase of \$45,730.23 over the previous year. The sources whence these salaries were derived, and the amount from each source, were as follows:—Province, \$95,339.27; Counties, \$55,258.64; Sections, \$85,227.76. (Table N.) Applying to the sum of these amounts the scale of proportions for salaries recommended by the Council of Public Instruction, the approximate average of the salaries of the several classes of teachers for the whole school year was at the following rates: Male Teachers, Class 1st, \$392; Class 2d \$294; Class 3d, \$196. Female Teachers, Class 1st, \$294; Class 2d, \$196; Class 3d, \$147: average salaries of teachers for the year, without respect to class, \$258.53. This does not include the salaries of the Head Masters of County Academies. In 1865, the average was \$239.67; and in 1864, \$146.85.

3. The increase in the salaries of teachers is one of the most gratifying and significant features in connection with the recent educational reform. We may now reasonably expect that much talent of a good order will seek employment in the work of teaching, and that an increasing number of those who engage in this, one of the noblest of callings, will do so for life. It is abundantly evident that the people, with the assistance of the provincial and county grants, are not unwilling to provide a fair remuneration for teachers. Any deficiency in the number of teachers will be found to be but temporary and local, as the supply hereafter will chiefly depend upon the demand at remunerative rates.

An adequate and expansive mode of support having now been established by law, the examination and classification of teachers becomes one of the most important matters in connection with the system. "As is the teacher, so is the school," is, with obvious limitations, a sound educational maxim; and everything that contributes to the elevation and progress of teachers as a class, contributes also to the progress and efficiency of the schools. The object of the examination and classification of teachers is to ensure to each community and to the Province that the school training of the youth of the country is not assumed by incompetent or unworthy persons, and the children of the land thus defrauded of that preparation for the coming duties of citizenship which the law declares to be their right. The existing enactment provides thirty-four local committees of District examiners, and a committee of Provincial examiners for the Normal School. The great majority of these committees have discharged their important duties with diligence and care, and their appointment has proved to be one of the most beneficial provisions of the law. In consequence, however, of the adoption by the Legislature of the present admirable arrangement for the payment of fixed provincial grants to teachers, a different provision for their examination and classification seems to be required. Every teacher of the same class is now entitled, and justly so, to an equal grant from the public

treasury for his services. In order, therefore, that justice be guaranteed to the Province, and to the Teachers in different Districts and Counties a uniform examination and classification are indispensable. This cannot be secured under existing arrangements, since thirty-four different committees must of necessity adopt thirty-four different scales of classification, notwithstanding that they have a uniform outline of subjects before them. Many of our ablest examiners have repeatedly pointed out to me this defect, and many committees in consequence of this want of uniformity have been compelled, in a conscientious discharge of their duty, to require the re-examination of all teachers from other Districts. In fact, this is the only safe course for them to adopt in order to maintain the character of their schools, and to do justice to all their teachers. But while this course is necessary under present arrangements, it excludes the very flower of the teaching profession from the enjoyment of those immunities to which their attainments and ability entitle them, and subjects them to continual and in their case needless re-examinations. Every teacher of established character and ability should have the range of the whole Province before him in choosing his field of labour, and every board of trustees desiring to procure the services of such a teacher should have a like range from which to make their selection. Under the present arrangement the validity of each license is confined within the limits of the District in which it is obtained, so that by stepping over a line, and in the majority of cases without leaving the county, a teacher, though it may be, many times examined, and as often licensed, finds himself without the requisite authority to conduct a public school. If he should, under such conditions, accept the charge of a school, he does so entirely on risk, and after months of diligent and arduous labour, he may find himself debarred from all participation in the public funds. Nor is this only a possible case. At the last semi-annual distribution in one District, three of the fourteen teachers employed during the term, were necessarily cut off from public aid because, though regularly certificated, their licenses had been obtained in another District. It is obvious that such an arrangement cannot be regarded as satisfactory.

I beg, therefore, to suggest, for the consideration of the Legislature, whether it would not be wise to empower the Council of Public Instruction, after the present term, to prescribe the times and places for the examination of teachers, and to secure their uniform classification by means of a Provincial Board of Examiners. I am of opinion that this would be the most efficient mode of obviating the difficulties arising under the present arrangement. The principal details of the plan suggested would be as follows:

1. That the Provincial Board of Examiners consist of four members, resident at or near Halifax. For the sake of efficiency and dispatch, the various branches of scholarship should be apportioned between three members of the Board, while professional subjects, such as school organization, classification, methods of instruction, and the like, should be assigned to the fourth.

2. That a uniform schedule of examination questions on each syllabus be prepared under the supervision and with the approval of the Council, printed, and forwarded under seal to the several Inspectors. This course has been repeatedly suggested to me by many of the present Examiners, and as each syllabus of examination is already prescribed by the Council, it seems well to require their approval of the questions founded thereon.

3. That each Inspector, or, if necessary, a deputy, preside at each examination in his county. He would be required to enter in a blank form the name, age, sex, experience, character, &c., of each applicant, and to test and record the attainments of each with respect to reading and other oral work. The printed questions would then be submitted to the candidates, and immediately on the close of the examination all the papers would be transmitted to the Board at Halifax. Each member of the Board being entrusted with the examination of papers on specific subjects, the value of each applicant's work would be ascertained

with expedition, and a corresponding certificate transmitted to the Inspector.

It appears to me that this plan would be found in practice to combine in a very high degree the advantages inherent in both the local and general modes, with few or none of the disadvantages that necessarily attach to the exclusive adoption of either. Its operation would inspire a mutual respect among teachers for each other's claim to membership in a common fraternity, an *esprit de corps* already manifesting itself among the teachers in some parts of the Province, would be cherished and rapidly developed, a degree of permanence would be given to teaching, and a satisfactory guarantee would be had that the uniformity of qualification implied by a uniform scale of Provincial grants, has an actual existence in the practical operation of the system.

The granting of 3d class permissive licenses of *local and temporary* value could be as readily effected as at present, in order to meet any exigency which might temporarily arise in a few of the more backward Districts of the Province. The examination of the students attending the Provincial Normal School could also be most efficiently conducted in connection with the Board of Examiners.

Teachers' licenses would, of course, be subject to suspension or cancellation by the Boards of Commissioners, in the same manner and for the same causes as at present.

NEW BRUNSWICK.

TEACHERS AND ASSISTANTS.

The 793 Schools in operation during the past year were conducted by 804 Teachers, thus shewing the employment of 11 as Assistants in the same number of large Schools. In the Summer Term the 829 Schools were under the charge of 844, including 15 Assistants. The total increase of Teachers for the whole year was 33 in Winter and 18 in Summer.

This result is certainly indicative of considerable progress, and will no doubt be so regarded by most reasonable men, although indeed it may not come up to the full extent of their wishes. It may however be interesting to set the matter in another light, and compare the operation of 1866 not only with those of the previous year, but with those of the year when this Department was first organized as it now is. In looking back fifteen years therefore, we find there were in

1852,	682	Teachers,	with	18,591	Pupils.
1866,	844	"	"	29,781	"
Increase in favor of 1866,	162	"	"	11,190	"

But this is not all. Of late years the Legislature has given grants to a considerable number of Denominational and other Schools, the Returns of which are not included in the above enumeration, but the establishment of which has naturally reduced the number of the Common Schools. The Denominational Schools, and the other Schools receiving special grants, have so increased that they now employ about 30 more Teachers than they did in 1852.

In connection with this subject, the increase in the number of Assistant Teachers before mentioned, is deserving of special notice. The number of Schools in which Assistants were engaged within the year was 17, and the number of pupils enrolled in them gives on the average about 92 to each School, or 46 to each Teacher. The daily average attendance is also better than in the Schools generally; for whereas the ratio of average attendance to the whole number enrolled is, for the Province, 52 per cent., for these double Schools it is a fraction over 55 per cent. These are facts which speak for themselves, and I feel sure that a further extension of the principle of employing Assistants in such numbers as may be desirable, would speedily lead to still greater results in respect to attendance, as well as to other important improvements. It cannot well be otherwise. The employment of Assistants necessarily implies a division of labour, and a division

of labour as assuredly implies a superior quality of instruction. When by a skilful division of labour in a School, a Teacher has but a few, and these larger classes to attend to, he is able to devote to them a proportionately greater part of his time, to supplement the usual lessons by much valuable information, to bring the sympathy of numbers to the aid of his oral instruction, and thus make learning, instead of the dreary and irksome task it too often is, a work in which the young can engage with as much pleasure as advantage. I have therefore to recommend that the Law in respect to Assistants may as soon as possible be changed so as to allow, not merely one Assistant to one large School, as is the case now, but as many Assistants as circumstances may render it desirable to employ, and under proper regulations to be made by the Board of Education.

TEACHERS TRAINED AND UNTRAINED.

In the Winter Term of the past year there were employed in all 804 Teachers, of whom 569 were trained—a proportion less by 3 per cent, than obtained in the corresponding Term of 1865. During the Summer, 612 of the 844 Teachers engaged were of the trained class, or a little over 71 per cent. of the whole, this proportion being also less than that in the previous year.

It may be as well to continue here the Table begun some years ago, which shews at a glance the numbers of Trained and Untrained Teachers employed in the Summer Terms from 1858 to 1866 inclusive:—

	TEACHERS.	TRAINED.	UNTRAINED.
1858	762	313	449
1859	823	442	381
1860	846	527	319
1861	834	530	304
1862	831	554	277
1863	789	561	228
1864	823	580	243
1865	826	598	228
1866	844	612	232

It thus appears that the Trained Teachers are slowly but steadily increasing in such numbers as afford a reasonable hope that a few years more and the Common Schools of the Province will be under their exclusive control as far as teaching is concerned. This idea, and the bare possibility of its being realized, should powerfully stimulate Trained Teachers as a class to renewed exertions with a view to render themselves more and more worthy of public confidence as well as of the momentous interests entrusted to their care. Upon them, more than upon any other agency at work amongst us, must depend the mental and moral standing of our several communities; and I for one am firmly persuaded that if in the future this country is to hold its own and maintain its just influence in the Councils of the Confederate Provinces, Education must be improved in quality under Trained Teachers, and made universal by means of Free Schools, supported by an equitable tax upon the property of the country.

I must not, however, fail to do justice to a number of Teachers, technically speaking, Untrained, who have yet proved themselves, through many long years of hard service, both zealous and successful instructors of youth. To these men and their fellow workers the country owes a debt of gratitude which is poorly requited by their present salaries; and the establishment of a fund, partly at the public expense, to provide retiring allowances to aged and enfeebled Teachers, would be an act dictated alike by humanity, justice and sound policy.

One remark more under this head. In the past year, as was noticed in 1865, we observe a decrease in the number of first class Teachers, both male and female, with of course, a corresponding increase of those of lower classification. This looks like a step backwards; but it is perhaps more apparent than real. No doubt the retirement of these highly classed Teachers, being, as some of them are known to have been, persons of considerable experience and undoubted ability, is very much to be regretted;

but there is reason to believe that their places are being not unworthily filled. In any case, we have no present means of retaining the services of Teachers whose talents and acquirements can command a higher remuneration in other departments of labour, or in the same department elsewhere. When the people shall see it to be their interest to supplement the very liberal Provincial Grant by larger and more promptly paid local appropriations, we shall not only have fewer occasions to regret the retirement of efficient Teachers, but the best ground to hope for a large addition of devoted men and women to the ranks of the profession.

RELIGIOUS DENOMINATION OF TEACHERS.

The 844 Teachers employed during the last Summer Term were distributed among the different denominations as follows:—

Episcopalians,	163,	Baptists,	203,
Roman Catholics,	203,	Congregationalists,	7,
Presbyterians,	153,	Others, or not reported,	9.
Methodists,	106,		

TEACHERS, MALE AND FEMALE.

Of 804 Teachers engaged in the first half of the past year, 422 were males, and 382 females; and in the Summer Terms, of 844 Teachers, 424 were males, and 420 females. It thus appears, that while the number of male Teachers was nearly the same in both Terms, there were not less than 38 more females employed in summer than in winter. This has been generally the practice hitherto, and the cause is pretty obvious. In winter, the Schools, particularly in the rural districts, are attended by boys of such advanced years that their usefulness in the field and elsewhere prevents their attendance in summer. This arrangement, requiring not unaturally the services of more male teachers in winter, readily accounts for a corresponding lessened number of females, who, even though as well qualified in other respects, are not so well fitted as men to undergo the hardships of winter life in the country, or the long and fatiguing walks which the custom of boarding round necessarily involves. Till this custom is discontinued, and the Province becomes more thickly inhabited, the services of men are sure to be in constant demand, especially as winter teachers; and it will therefore be well for all concerned in promoting education, to try and get a larger number than usual of young men of good habits and respectable attainments to attend the training School, and, by study, observation and practice, to prepare to enter creditably upon this useful field of labour. Female teacher will still be required for both summer and winter work, and in greater numbers as improved attainments shall have increased their popularity, and when graded schools in the cities, towns and villages, shall render their services at once the cheapest and the best.

PROVINCIAL EXPENDITURE.

The amount drawn from the Treasury in Payment of Teachers' salaries in the winter Term, was \$40,162.17, or an increase of \$1,514.29 over the corresponding Term of the previous year. In the summer Term, the sum required for the like object, was \$41,032.29, against \$41,023.62, or the small increase of \$8.67.

The other expenses of the Department for the year will be found detailed, as usual, in Table G of the Appendix, page 3S, amounting in all to \$93,306.92, as against \$91,373.92 in 1865, or an increase of \$1,933.

LOCAL EXPENDITURE.

It is some satisfaction to note, along with the increased expenditure on the part of the Province in the winter Terms a nearly corresponding increase from local sources, or \$52,427.94, as against \$51,060.10, or an increase of \$1,038.88. In the following Term, however, there is found a decrease of \$495.75, the amounts being respectively \$52,427.94 and \$52,923.69. It is proper to observe, notwithstanding, that the local expenditure

exceeds the amount reported to be derived from subscriptions, tuition fees, and assessments being \$103,488.04.

This sum, added to the Provincial expenditure of \$93,306.92, before referred to, together with the grants to the University, the Madras, Denominational, Grammar, and a few other Schools not included in the above, but amounting to \$23,155, makes the total appropriation for educational purposes, from all sources, for the year, \$219,949, exclusive of a large, but unreported cost for new School-houses, repairs, furniture, and apparatus.

PUPILS.

The number of Pupils on the Rolls in the first Term of the past year, was 27,809, or an increase of 392 over the corresponding period of 1865. In the summer, the registered attendance was 29,781, of a decrease of 194, thus showing a small increase for the whole year.

It must be remembered, however, that even the largest of these numbers do not represent fully the attendance during the year. The fact is well known, and has been frequently referred to in former Reports, that the pupils do not, as a rule, attend School the whole year round, the younger children going in summer, and the elder in winter, as best suits their convenience. It is plain, therefore, that the School Returns which are made half-yearly, at the close of September and March, cannot embrace the attendance for the entire year; and the difficulty of getting at the exact number is further increased in many instances, by the circumstance, that the School has had two different Teachers within that time. But, however difficult it may be to ascertain the precise attendance, it is certain that a large rate per cent. will have to be added to the number enrolled in either of the Terms, before we can arrive at any thing like a correct estimate of the pupils who have been members of the Schools for longer or shorter periods within the past year. Calculating, therefore, from the best date within reach, I should judge that the number withdrawn from the winter Schools, would be about one fourth of the whole enrolled attendance, or 6,952, which, added to the summer attendance, will give 36,733, as the whole numbers on the Registers of the Common and Superior Schools in 1866. Adding again to these figures, the pupils at the Grammar, Denominational, Madras, and other Schools receiving public aid, and not included in the above enumeration, or about 2,500, and we have 39,233, or about a seventh of our population, as the estimated number at the public Schools in the past year.

COMPETITIVE EXAMINATIONS.

With a view to still further increase the attendance, as well as to excite a generous emulation amongst the pupils, and create additional interest in their Schools among the people themselves, it was decided last year to try the effect of a Competitive Examination for Prizes, to be open to a limited number of the more advanced pupils from each of the Schools in the County of Restigouche. The idea had originated some time previously with the present Postmaster General, who, with his colleague in the representation, undertook to provide the necessary prizes and otherwise assist in maturing the local arrangements for the examination. Accordingly in the month of April, circulars were issued from this office to all the Teachers in that County, apprizing them of the intended competition, and inviting their co-operation. The result was, that on the 1st August, the day appointed for the trial, 31 pupils, from 9 different Schools, accompanied by their Teachers, parents, and a large number of interested spectators, met in the Mechanics' Institute at Dalhousie, and there, for nearly 8 hours, underwent a searching examination in writing, conducted by the President of the University, the Inspector of Schools for the District, and myself. After a careful scrutiny of the test-papers, the prizes were on the following morning distributed to the successful competitors, in the presence of their friends, short addresses delivered, and the proceedings brought to so successful a termination, that before separating it was re-

in many of the languages of German derivation the word signifying a physician is identical with that given to the leech. From an English exchange we gather the following facts relative to the life and habits of this species of aquatic worm, which is indeed among the lowest classes of the animal chain of being:—

“There are about thirteen or fourteen species of the leech, some of which are found in most parts of the world; but the medicinal species is best known, and abounds in various parts of the world—as America, Russia, Hungary, Spain, Portugal, in the marshy plains of Egypt, and in various parts of Asia. It belongs to the class *annelides*, or ringed worms, its body being composed of a series of rings, or circular muscles, by the successive contraction of which it moves along either in the water or upon the surface of leaves, reeds, or other solid bodies. The tail extremity is in the form of a cup, or sucker, by which it adheres firmly to flat substances, on the same principle as a boy's leather sucker adheres to and lifts up a stone. The mouth is also in the form of a sucker, and is, moreover, furnished with three cartilaginous teeth, placed so as to form with each other a triangle. When examined and felt with the point of the finger, they seem soft and blunt; but the animal, when about to pierce the skin, seems to have the power of erecting them into firm, sharp-edged lancets, which saw through the integuments in a single instant, and almost without inflicting any pain. Having made the puncture, the blood is extracted by a process of suction, and is passed through the oesophagus into the stomach, or rather stomachs, of the animal, which consist of a series of communicating cells, that occupy the greater part of the interior of its body. The leech having thus gorged itself to the utmost, if undisturbed, remains in a half-torpid condition till it has digested its gory meal, and not unfrequently dies of the surfeit. If it survives it will be greatly increased in size. They can live for months and years on what appears to be pure water alone. This forms the singular circumstance in the diet of these animals. They delight to gorge themselves with a full meal of blood, even to surfeit; and yet with plain water they live, grow, and seem to have the greatest enjoyment of existence. It would appear as if their three lance-formed teeth, and their carnivorous appetites, were bestowed more for the benefit of man than for themselves, and that, in their system of dietetics water is the rule and blood the exception.

The medicinal leech is a native of many parts of Britain, but is now becoming very rare. France is supplied chiefly from Strasburg, to which they are imported from Hungary, Turkey, Wallachia and Russia, and kept in ponds. They are carried into France on spring wagons, and are contained in moistened bags, each bag containing 120 leeches. Previous to 1834 upwards of 46,000,000 of leeches were imported into France annually. At present the numbers have decreased to 17,000,000. They are imported into London and Leith by sea, packed in little bags, which are occasionally moistened with water during the short voyage. In general they arrive fresh and healthy; but they are not unfrequently liable to disease, which destroys great numbers. There are three sorts, or sizes, the largest and middle sorts being reckoned the best. A large leech is calculated to abstract half an ounce of blood, besides the quantity which flows from the wound afterward. The smaller sizes are comparatively inefficacious.

A common animal in the pools of this country is the horse leech. It nearly resembles the other, but is of a more uniform color, and not so decidedly marked with greenish streaks on the back as the medicinal species. The horse leech has no great inclination to fasten on the human skin, but when it does so it takes its fill, just like the other, and no more. There is a popular but unfounded belief that if a leech of this description do fasten on the skin, it will continue to suck and discharge the blood till every drop in the body is exhausted. Hence they are the dread of every school boy who happens to wade with naked legs into their dominions.

The leech, like many other animals, appears to have a very nice sensibility in regard to atmospheric changes, and especially

what regards the electric modifications of the air. Before storms, or any sudden change in the atmosphere, the leech is seen in great activity, and darting up to the surface of the water in its jar. These animals, too, at certain times, are found to move out of the water, and remain for a considerable period clustered on the dry upper surface of the jar; while on other occasions they will remain for days immersed in the water near the bottom. They produce small eggs, which form into cocoons, from which in due time the living young make their appearance.—*Scientific American*.

Mont Cenis Railroad.

On account of the long time which must yet be consumed before the Mont Cenis Tunnel is finished,—four and a half miles yet remaining to be executed,—it is proposed to place a temporary track over the summit of the mountain. An experimental line of one and a fourth miles has been constructed on the most difficult portion of the route. By the report of Capt. Tyler, of the Royal Engineers, this distance is ascended in eight and a half minutes with a load of sixteen tons, though the average grade is as steep as one in thirteen, and at a maximum of one in twelve. The plan adopted to obtain adhesion is an arrangement of horizontal drivers biting on a central rail. This plan, though regarded as new in Europe, was long ago patented and used in America.—*Journal of the Franklin Institute*, Nov., 1865.

A paper on the same subject was communicated to the British Association, in 1866, by Mr. J. B. Fell. After alluding to the various difficulties presented to the advance of railways by mountain ranges, and the efforts made to overcome them, it was stated that the use of the centre-rail was first thought of by Messrs. Vignolles and Ericsson, in 1830, and proposed to be applied to the inclines on the Manchester and Liverpool Railway; but it was not put into operation. In ignorance of what was then done, Baron Leguir, in France, the writer, and others, also applied their minds to a solution of the problem of constructing railways over steep gradients. It was not till Mr. Brassey and the writer built a centre-rail engine, and laid down a length of line on that plan on the Comford and High Peak Railway for experimental purposes, in 1863, that the system was put into practical operation, the experiments being entered into in order to satisfy the Italian Government as to the feasibility of laying down a line on a similar principle over one of the Alpine passes. The mean gradient of the first twenty-four miles of line from St. Michael to Lausleburg, is one in sixty, with a maximum gradient of one in twelve; the other twenty-four miles, the mean is one in seventeen; and over the whole length there are at intervals curves of two chains radius. The line rises to an elevation of seven thousand feet, and is exposed in places to avalanches and heavy snow-drifts; but it will be suitably protected. The system of locomotion adopted was that of a third or traction rail, on which adhesion could be obtained by horizontal wheels, worked by the engine in conjunction with or independently of the ordinary driving-wheels, which admitted of the weight of the engine being reduced to a minimum, while the pressure upon the middle rail could be carried to any required amount, and gradients of one in twelve worked with as much certainty and safety as those of one in a hundred. The centre-rail also furnishes the means of applying most powerful brakes for controlling the descent of the trains, and greatly diminishes the frictional resistance in passing round sharp curves. Besides this, the centre-rail rendered it almost impossible for the train to leave the rails. The first experiments were tried in the Comford and High Peak Railway from September, 1863, to February, 1864. The weight of the engine and load was from sixteen to seventeen tons. It never failed to take loads of from sixteen to twenty-four tons up gradients of one in twelve, or in working round curves of two and a half chains radius on that incline, the brakes having perfect control over the train on the ascent. Certain improvements sug-

gested themselves,—the boiler-power was insufficient, the inner machinery too crowded and inaccessible, and the connecting-rods, working at too great an angle, by an irregular, impulsive movement, diminished the adhesion of the horizontal wheels. The improvements were made and further experiments conducted with special reference to the requirements of the Italian Government, which included three trains a day each way, the mail train to perform the journey at an average rate of twelve miles an hour, including stoppages, the speed up the steepest incline being seven and a half miles an hour, while the gross weight of the train was to be sixteen tons. The mixed and goods trains were to carry forty and forty-eight tons each, with two engines. The traffic on these trains represented a return of £100,000 annually. The writer described the official trials in Italy in the presence of the representatives of the English, Italian, Russian, and Austrian Governments. The result of the trials exceeded the estimate both as to speed and weight of the trains, and Captain Tyler, who represented the Board of Trade, reported "that this scheme for crossing Mont Cenis is, in my opinion, practicable, both mechanically and commercially, and that the passage of the mountain may thus be effected, not only with greater speed, certainty, and convenience, but also with greater safety, under the present arrangements..... There is no difficulty in so applying and securing that middle-rail, and making it virtually one continuous bar, as to preclude the possibility of accident from its weakness or from the failure of its fastenings; and the only question to my mind is whether it would not be desirable still further to extend its application to gradients less steep than one in twenty-four, with a view to greater security, especially on curved portions of the line." Similar favorable reports were quoted from the French Imperial Commissioner, while it was stated that those of the Italian, Russian, and Austrian Commissioners were equally favorable and conclusive. In November and December last, the French and Italian Governments granted concessions, authorising the railway on the Imperial postal road over Mont Cenis with a width of about thirteen English feet; and a company has since been formed to carry out the undertaking. The works were commenced in March, and the line is expected to open in May next.

Attention was directed at some length to the conditions essential to the success of the system, the first of which was the employment of different types of engines, according to the heaviness of the gradients; of each of which full descriptions were given, with the aid of colored diagrams. The carriages, as well as the engines, are each furnished with four horizontal wheels, which have flanges underlapping the centre-rail. These act both as guide and safety wheels, preventing the carriages from leaving the rails, and, by guiding them round the curves, greatly diminish the frictional resistance and the tractive power required, thereby rendering it easy to reduce the weight of the engine to that which was necessary for producing and carrying the power required for the traction of the train. The economy of weight has been effected by a simpler arrangement of the machinery, and by using an improved quality of material. For the making of mountain lines, which are exposed at certain seasons to an unfavorable climate, from the effects of snow, frost, and fogs, it was desirable to devise some means of cleaning the surface of the rails, and for improving the state of adhesion as the trains advanced, so as to dispense with the use of sand. This might be done at speeds from five to ten miles an hour; ice and snow might be cleared off by cutters attached to the engine; and, in seasons of mist, new machinery could be probably contrived for removing that almost imperceptible film of mist which diminishes the adhesion to nearly the same extent as ice. The adhesion was best in the winter, when the snow remained for months in a state of dry powder; but the places where it accumulated were protected by covered ways, and the rails were always in good condition.

He said that the centre-railway system was never intended to be worked on any except the steepest inclines, where no other

engines could work. It would be only necessary to have a covered way for fourteen kilometres, which would cost £40,000. One kilometre in the avalanche district, which was well known, would have to be protected by stone; but the remainder could be protected by wood, which was amply strong enough to resist the weight of from twenty to thirty feet of accumulated snow.—*Reader.*

Charles Dickens on Life Insurance.

When a civil engineer makes a profile drawing of the various "cuts," fillings, embankments, &c., of the work to be done within any particular division of some proposed railroad, he leaves out all the perfectly level spaces, and merely indicates their existence by figures placed at points where these long plains begin and end. Thus, if with a profile on a scale of two feet to the mile, he finds that sixteen inches of that will be drawn on his profile in perfectly horizontal lines, he leaves out the sixteen inches of plain, bringing the two nearest hills together, and where their outlines join, places a figure indicating the length of the plain to be inserted between the two; not only this, but all the inclined lines are made steeper in a certain proportion, thus compressing the profile that would otherwise occupy a space of twenty four inches into less than eight. This is technically called "exaggeration."

The style of exaggeration is exactly what Dickens and every other good novelist does in his profile of society. He leaves out all of the dead level people, in whose characters there is nothing that rises above or falls below the common plain. His characters have always some salient peculiarity. As in the engineer's profile, though the hills do not rise higher than the actual measurement, so in Dickens' characters, though they never exceed in grotesqueness what has been witnessed in actual life, the perpendicularizing of the lines and the grouping of all these prominences together, and the leaving out all the intervening platitudes of nature and humanity, make them seem like groups of grotesque, lop-sided cliffs in the one, and as grotesque, lop-sided men in the other.

Following out the principle, Mr. Dickens seizes not only upon the salient points of individual character, but also upon social peculiarities, and one after another has presented to the public, in this form of "truthful exaggeration," almost every institution of the present social system for condemnation or praise.

Life insurance seems to have arrested his attention, as one of the interposing features of civilized society, and as one in which are originated many strange, romantic, and tender, as well as many of the most selfish and diabolical human acts.

Two life insurance stories have appeared at different times in "All the Year Round," "Hunted Down," and lately, "Thomas Griffith Wainwright, the Poisoner." To both of these stories Mr. Dickens' name appears as the author. The last mentioned one, which was republished in "Every Saturday," for February 9th, was, no doubt, elicited by the popularity which the thrilling interest of the first one rendered so popular. The style of this last story is nothing like so readable as the former, and we are strongly inclined to doubt its claims to such celebrated paternity. Its appearance in "All the Year Round" seems to warrant the assumption that the illustrious novelist may have acted as a god-father to the bantling of some young writer; but with such a splendid plot it is a disparagement to the genius of Dickens to suppose that he would not have made more out of it.

In these two stories the dark side of life insurance is presented to the public view. In each a young and trusting woman's life is destroyed slowly and with devilish blandishments, in order that the human vampire who accomplishes it may get the money on the policy. The idea is one of such horrible interest that most of the readers will doubtless regard it as one of those that find a place in a fiction alone. But it is pretty well understood that Dickens never takes his starting point for a story from the ideal alone. Everything that he has written has been found at last to have a foundation in fact, and, like the civil engineer, he

only exaggerates in discarding the platitudes. These are the very opposite of the pathetic little "Life Insurance Story," which we published; but both are truthful conceptions of the workings of life insurance in society; and here in Chicago within the past year, we have had many instances that prove truth is tranger than fiction. — *Chicago Banking and Insurance Chronicle.*

Eloquent Passage.

One of the finest things George D. Prentice ever wrote is this inimitable passage: "It cannot be that earth is man's only abiding place. It cannot be that our life is a bubble cast by the ocean of eternity to float a moment upon its waves and sink into nothingness. Else why is it that the high and glorious aspirations which leap like angels from the temple of our hearts, are for ever wandering unsatisfied? Why is it that the rainbow and cloud come over us with a beauty that is not of earth, and then pass off to leave us to muse on their loveliness? Why is it that the stars which hold their festival around the midnight throne, are set above the grasp of our limited faculties, forever mocking us with their unapproachable glory? And finally, why is it that the bright forms of human beauty are presented to our view and taken from us, leaving the thousand streams of our affection to flow back in an Alpine torrent upon our hearts? We are born for a higher destiny than of earth. There is a realm where the stars will be spread out before us, like islands that slumber in the ocean, and where the beautiful beings which pass before us like shadows will stay for ever in our presence." — *New-York Tablet.*

Mexican Silver Mines.

A newly discovered mine belongs to any person who denounces it, provided a shaft of at least ten varas in depth be sunk on the vein within sixty days after it is denounced. A claim consists of 200 varas square. Mines that have been abandoned, or those in which work has been suspended for a space of four consecutive months, may also be denounced. The reducing and crushing work (*haciendas de beneficio*) are considered as having been abandoned, and may become the property of whomsoever denounces them when they no longer serve for their original purpose—when the roots have fallen in and the machinery has been removed—but the owner has a delay of four months to resume operations if he wishes to preserve his property. A miner or the proprietor of metallurgical works can be expropriated by his creditors who may take possession of a mine and work it for their own benefit until the debt contracted by the owner is extinguished; but they are compelled by law to allow him sufficient means to maintain himself and family. A shepherd or a laboring man accidentally discovers near these *crestones*, which rise above the surface, quartz containing metallic substances. He endeavors to procure some rock at a depth where it has not felt the action of the atmospheric air, builds a fire in which he casts a few pieces of ore at a very high temperature, and if specks of silver are observed the mine is denounced for the purpose of securing possession of it to the discoverer. The law requires a shaft to be sunk in the vein of at least ten varas within 60 days after the denouncement, at the expiration of which if the mine has been ascertained to be a new one, or to have ceased to be the property of a former denouncer, a grant is made of 200 varas square. The grantee then procures partners to develop the mine, should he lack capital for that purpose. The value of the mine is divided into twenty four shares, called *barras*, the half of which is given over to the capitalists, named *aviadors*. The regular development of the mine then commences. When a depth has been reached where silver is generally the most abundant, and the quantity of water and expenses of extracting not yet too considerable, the yield is very remunerative; at this stage of development, reducing works are erected (*haciendas de beneficio*) frequently on a large scale not always based on the future general yield of the veins. At the same time underground work is carried on to facilitate operations, as also the extraction of the ore, and the draining of the mine. When mines in the *bonaza* condition are in the hands of one individual, as in the case of Counts de Valenciana and Reglas, and the Marquis de Rayas, these works are remarkable not only for their magnificence and extent, but for their utility in prosperous times, when without them the ores becoming poorer could not be extracted through the older communications. In most cases at the present day the 24 *barras*, which constitute the shares of a mine, are divided into

small fractions, and represent numerous conflicting interests which seem to combine but for one purpose that of realising from the undertaking as much as possible, disregardful, of the evil consequences which may affect the future prosperity of the mine. Their motto appears to be "Sufficient unto the day is the profit thereof." The consequences of this view of mining operations is that no regular and methodical course is pursued, the richest ore only being extracted at several places at the same time, or where it is most easily obtained, masses of poorer ore being left behind, the working of which is resumed when the *bonanza* ceases. It is difficult to understand why a small amount of these enormous profits is not devoted to researches which are undertaken, only when the expenses exceed the profits, and the prospects of a profitable investment are doubtful. When the zone of the greatest yield has been worked through, if the depth is such as to render the cost of extradition too considerable, the *bonaza* ceases. The poorest ore left in upper parts of the mine is then worked, and as the greatest expense is the draining, the water is allowed to fill the lower works. For some time the reserve of ore of medium yield is sufficient to cover expenses; but beyond a certain point, day or contract work for a certain weight of ore extracted is no longer profitable; and in order to guard against the chances of loss, the miners are allowed an interest in the profits, say one sixth, one third, and even one-half of what they extract. The owner furnishes tools, light and powder, the draining and hoisting being also at his expense. This is called *partido*; the miners, who are then called *buscones*, prefer it to day or task work, and as it is voluntary labor they take it easy, and find a certain charm to be indebted to chance for their salary, which will frequently in one week, be enormous, after working for a month or more without earning scarcely sufficient for their maintenance. Gradually the resources are exhausted, and the number of men only required by law are kept at work, in order to retain possession of the mine, and new *aviadors* are found who supply the funds necessary for the expense of draining and continuing the work in the lower part of the mine, running prospecting drifts at points where ore was expected to be found, but which had been neglected when the mine was full of water. — *New Orleans Price Current.*

OFFICIAL NOTICES.



NOTICE.

The Bureau of Education was closed in Montreal on the 20th Oct. and reopened on the 5th Nov. in Quebec, where all correspondence should be addressed to the Hon. the Minister of Public Instruction.

LOUIS GIARD,
Superintendent of Education.

NOMINATIONS.

DEPARTMENT OF PUBLIC INSTRUCTION.

His Excellency, the Lieutenant-Governor in Council, on the 4th Nov. 1867, was pleased to make the following nominations:—

Mr. Pierre Chauveau, to be French Corresponding Clerk, Assistant Editor of the *Journal de l'Instruction Publique*, and Librarian, in place of A. N. Montpetit, Esq., transferred to the Hon. The Provincial Secretary's Office.

Mr. Patrick Delaney, to be English Corresponding Clerk and Assistant Editor of the *Journal of Education*, in place of J. J. Phelan, Esq., Advocate, transferred to another Department.

Mr. Alfred Thomas, to be Accountant and Clerk of Statistics, in place of Alexandre de Lusignan, Esq., resigned.

Mr. Léopold Devisme, to be Assistant French Corresponding Clerk, in place of J. B. Lenoir, Esq., transferred to the Hon. The Provincial Secretary's Office.

Mr. J. B. Marcoux, to be Assistant Clerk of Accounts and Statistics, in place of Pierre Chauveau, Esq., transferred to another Department.

JACQUES CARTIER NORMAL SCHOOL.

Mr. Joseph Octave Cassegrain, to be Regular Professor, in the Normal School, in place of T. Dostaler, Esq., deceased.

Mr. Arthur Duval, to be Professor, in place of J. O. Cassegrain, Esq., appointed Regular Professor.

Mr. William Fahoy, to be English Teacher of the Model School and Associate Professor in the Normal School, in place of Mr. P. Delaney, transferred to the Department of Public Instruction.

The Rev. Mr. Routhier, to be Prefect of Discipline and Associate Professor in the Normal School.

Mr. Gualbert Gervais, to be Accountant and Secretary to the Rev. The Principal of the Normal School.

LAVAL NORMAL SCHOOL.

The Rev. M. Otisac, to be Prefect of Discipline and Associate Professor in the Normal School.

The Rev. Mr. de la Chevrotière, to be Prefect of Studies, in place of the Rev. Ignace Langlois.

Mr. Fortunat Rouleau, to be Secretary to the Rev. The Principal of the Normal School.

BOARD OF EXAMINERS.

His Excellency, the Lieutenant-Governor of the Province of Quebec, by an Order in Council of the 19th Sept. last, was pleased to name Edouard Boudreau, Esq., M. D., of Bay St. Paul and Onézime Gauthier, Esq., of St. Urbain. Members of the Board of Examiners for the Counties of Charlevoix and Saguenay.

SCHOOL COMMISSIONERS.

His Excellency, the Lieutenant-Governor of the Province of Quebec, by an Order in Council of the 19th Sept. last, was pleased to approve of the nominations of the following Gentlemen, as School Commissioners :

County of Joliette, St. Paul—Messrs. Louis Faust, Michel Jolicœur, Joseph Gougé, Nazaire Piché and Magloire Perrault.

County of Joliette, St. Alphonse—Messrs. Théophile Provost, Thomas Kelly, John Dignan and Joseph Arthur Renaud.

County of Champlain, Ste. Flore—Messrs. Joseph Dufresne, Jean-Bte. Bélanger, Louis Dupont, Raphaël Houle and Fabien Lavergne.

County of Saguenay, St. Augustin—Messrs. S. Robertson, T. Rule, J. Gallichan, M. Kennedy and D. Robin.

County of Huntingdon, Godmanchester—Mr. Alexander Hunter.

County of Terrebonne, St. Janvier—Mr. Octave Ouimette.

County of Arthabaska, St. Norbert d'Arthabaska—Messrs. François Larivière and Narcisse Talbot.

County of Kamouraska, Ste. Anne No. 2—Thomas Deguise, Esq.

County of Yamaska, Ste. Brigitte des Saults—Mr. Jules Jutras.

County of Quebec, St. Colomban de Sillery—John Roche, Esq.

County of Lotbinière, St. Sylvestre, South—The Rev. Mr. Edouard Fafard.

County of Chicoutimi, Jonquière—The Rev. François Gagné and Mr. Elie Perron.

County of Lotbinière, St. Giles No. 2—Messrs. Nazaire Dionne, Etienne Marcoux, Joseph Taylor, Sen., Jean-Bte. Paradis and Zéphirin Coulombe.

County of Dorchester, St. Edouard de Frampton—Messrs. Stanislas Lamontagne and Denis Cullen.

County of Ottawa, Notre-Dame de Bonsecours—Messrs. Mercier Gratton, Charles Racicot and François Marcotte.

City of Quebec—The Revs. Messrs. Joseph Auclerc and James Nevill, and Jacques Crémazie, Esq.

County of Quebec, St. Gabriel—Messrs. William Smith, Sen., and John Knose.

SCHOOL TRUSTEES.

County of Hochelaga, St. Jean-Baptiste—Messrs. Bridgman and Robert Elliott.

County of Argenteuil, St. André—Mr. Fabien Desjardins.

And by an Order in Council, dated 23rd July last :

County of Ottawa, Village of Montebello—Messrs. C. Beaudry, L. R. Poulin, Joseph Gravel, Jean-Baptiste Chevalier and Jean Beauchamp.

DIPLOMAS GRANTED BY THE BOARDS OF EXAMINERS.

ATLNER BOARD.

1st Class Elementary, F.—Mr. P. E. Duhamel ; Miss Rhoda G. McKay.
2nd Class Elementary, F.—Mr. Michael McCarthy ; Misses Adda Halfpenny and Agnès Villeneuve.

August, 1867.

JOHN R. WOODS,
Secretary.

KAMOURASKA BOARD.

1st Class Elementary, F.—Misses Catherine Duquemin, Léontine Langlais, Alvina Michaud and Lydia Morency.

2nd Class Elementary, F.—Misses Clémentine Gagnon, Justine Gauvin, Géraldine Legacé and Virginie Thiboutat.

August, 1867.

P. DUMAIS,
Secretary.

WATERLOO AND SWEETSBURGH CATHOLIC BOARD.

1st Class Elementary, F. and 2nd E.—Miss Louise Préfontaine.

2nd Class Elementary, F.—Misses Hermine Sicotte and Caroline Simard.

1st Class Elementary, F. & E.—Miss Eléonore M. Tétrault.

2nd Class Elementary, F. & E.—Miss Eugénie Bellefleur.

1st Class Elementary, F.—Miss Alvina Sansoucy.

October, 1867.

J. F. LÉONARD,
Secretary.

BONAVENTURE BOARD.

1st Class Elementary, E.—Messrs. Robert O. Styles and Robert Moir

2nd Class Elementary, E.—Mr. F. A. Boehmers.

1st Class Elementary, F.—Miss Marie Agnès Cyr.

November, 1867.

J. A. LEBEL,
Secretary.

JOURNAL OF EDUCATION.

QUEBEC, PROVINCE OF QUEBEC, OCTOBER & NOVEMBER, 1867.

Department of Public Instruction.

As will be seen from a notice inserted in our official columns, the Education Office was opened on the 5th November in Quebec, where all correspondence having reference to this Journal should be addressed.

To the Readers.

The readers of the Journal may possibly observe some defects in the present number of the Journal, arising, it is reasonable to suppose, from changes in the Educational Department under the new constitution, and the removal of the office with the archives, library, &c., from Montreal to Quebec. It is hoped that with the new year the regular issue of the Journal in single monthly numbers may be resumed and maintained, and efforts will certainly be made to render it in every way as useful as possible to the practical teacher as well as interesting to the general reader.

Legal Decision.

In the case Drolet vs. The School Commissioners of Roxton, Judge Johnston decided on the 24th September last at Waterloo :—That in the case of a seizure of movables for payment of school taxes, there are no legal exemptions, and that all movables, of whatever nature, may be sold.

Educational Department of the Paris international exhibition.

The Educational department of the Exhibition is divided into two portions—Class 89 contains all that concerns the instruction of children; Class 90, what concerns that of older persons. The report which follows relates exclusively to Class 89.

France, Prussia, Saxony, Sweden, Denmark, Austria, Spain, and Italy are the nations of the Continent which have contributed most largely to this portion of the Exhibition.

Taking these nations in the above order, I shall briefly notice such of their contributions as have seemed to me most deserving of our attention.

I. FRANCE.

Beyond all doubt the most striking and the most instructive sample of French Primary instruction is to be found in the large building in the park (near the Grande Porte) dedicated to the iron works of Creusot. Here Messrs. Schneider and Company exhibit a most complete account of their magnificent schools. The statistics, methods, rules, time tables, and work done by the scholars are ranged along the west wall. The schools are maintained chiefly, but not exclusively, for their workpeople's children. These pay 7d. per month; strangers, 14d. There are 2219 boys and 1846 girls in attendance. The boys are taught by twelve masters, the chaplain attending to give religious instruction; the girls by the Sisters of St. Joseph de Cluny.

Each of the two principal schools numbers about 900, and is divided into nine classes. The mean age of the highest class of boys is fourteen; of girls, thirteen; the mean age of the lowest class of boys is eight; of girls and infants, four. The course of instruction is fourfold:—

1. *French*, occupying ten or twelve hours in the week. Under this head come reading and committing to memory; and for the older children grammar and composition.

2. *History and Geography*, occupying about three hours per week of the girls' time, and from eight to four hours of the boys', the younger boys giving more time to it than the elder. A course of Bible history is included in this department.

3. *Science*, occupying five hours of the girls' week, and from six to ten of the boys'; in the girls' school "Science" means arithmetic and bookkeeping; in the boys' school it means arithmetic and geometry throughout, and for the elder boys it includes one hour of natural philosophy and mechanics, one of chemistry, and two of algebra.

4. *Arts* occupy twelve hours in each school. For the girls an hour every day of needle work and another of writing, with two hours of music; for the boys, writing, drawing, and music. On Thursdays and Sundays the children have holidays, with home tasks which are corrected the next morning.

Good marks are given for conduct and for lessons. These are carefully registered in the teacher's journal, together with his private observations. In August every year the marks of the year are counted up and added to the results of a general examination; the result determines the prizes. To these the boys look forward with much interest; but a far greater incentive to industry and good conduct is the admirable system of *patronage*. To the most deserving boys who leave the school an honourable career is opened in the company's employment as clerks or as engineers, to the next most deserving employment as workmen, while the undeserving have to seek their living elsewhere. This patronage is exercised rigorously according to merit; the poorest boy in the school knows that he may rise to situations of the highest responsibility in the company's service. To this, the company ascribe the very remarkable success which has attended the schools. Punishments are seldom needed. Where loss of marks fail to suffice, a letter is written to the parent, and the child's attendance at the school is suspended for a while. In twenty-six years not more than three cases have occurred in which final expulsion was found necessary.

In 1863 a night school for adult workmen was instituted, with an attendance of a hundred; last year the attendance rose to 260, and they asked to have special lessons in machine drawing. The result of the children's work, drawings, needlework, and copy-books seemed to me admirable.

From the Creusot school I passed into the main building, where, near the Rue des Pays Bas, is to be found the rest of the French educational exhibition. On the wall will be seen very complete plans of school buildings by M. Ucharl an architect (under No. 8 of the catalogue). The question of ventilation is yet unsolved in France as in England. Ventilators in the roof are condemned, and ventilating flues running alongside of the smoke flues preferred. But the success of this system depends on the length of the flue; and here the French

schools, two or three stories in height, have a great advantage over our single-story schools. Where the rooms are one over the other, several stoves combine in winter to increase the upcast draught, and the air-flue sucks the vitiated air through the floor-grates very powerfully; while the warm-air chamber of the stove is continually sending a fresh supply into the room. In summer, when the stoves are not lit, valves into the air-flues may be opened in the walls near the ceiling. A specimen of one of these ventilating-stoves may be seen under No. 105. But an open grate (such as those made by Hyde, of Winchester, with hot air chambers behind them) would fulfil the requirements of this system of ventilation quite as well.

Passing to what concerns instruction, Taupier's method of teaching writing (No. 51) well deserves attention. His copybooks are published by the great school publisher Hachette, (Boulevard St. Germain, 77). As in the best copybooks of all nations, the child traces a few lines over pale letters before he trusts himself to write unaided, pale lines guide the slope of the letters, and their spaces also, throughout the earlier books. The more advanced copy-books embrace invoices, addresses of letters, elements of grammar, &c.

In arithmetic, admirable facilities for teaching decimal weights and measures, the relation of the whole to its metric base being made obvious at once to the child's eye, may be seen in M. Demkes' staircase (No. 76), and in M. Carpentier's cabinet (No. 79). This last is most complete, having a pair of scales in which the several equivalents can be made manifest to the child's eye, each being also brought into relation with the base-metre.

In geography, Gervais's atlas of outline maps, to be filled up and coloured by the pupil (No. 22), should be especially noticed. The maps are most beautifully engraved, with the mountains in admirable relief, and cost only a penny a piece.

Among the results of scholars' work but little needlework appears. (1) The results of the boys' work are very satisfactory. The portfolio of drawings, especially the machine drawings, from M. Barbier's school (No. 197), as well as some excellent drawings and maps from the Algerian schools of Oran, well repay attention. But if an Englishman wishes to see the magnificent effort which France has made in the last three years to connect together the school and the workshop, he should pass on to Class 90, and there examine the results of the "enseignement secondaire spécial," to which the law, of June 1, 1865, is giving such a completely efficient organisation. The professional and technical schools take up the children at the point where the primary school leaves them. Here the girls learn bookkeeping, (2) wood-engraving, porcelain-painting, millinery; the boys, machine drawing, physics, and generally the principles applicable to whatever trade they are about to engage in. It is clear that the necessity of this kind of education for artisans is better appreciated in France than in England. These schools do not, it is true, belong to Class 89; but this higher course of instruction is beginning to react downwards, on the primary schools, requiring of them a more scientific teaching of the A B C of design. Some results of this may be seen from M. Delahaye's primary scholars, No. 201.

The rapid extension of *evening schools* all over France in the last two years has been most remarkable. In April, 1866, M. Duruy was able to report 22,980 evening schools for men and 1706 for women, attended by 552,939 men and 42,567 women. These are mainly supported by voluntary effort—three fifths of the schools being gratuitous. The law of last month offers a premium to any teacher of a day school thus volunteering to open an evening school.

II. PRUSSIA.

In a white house in the Park a room has been furnished by the Prussian Government with all that a school needs. It might perhaps have been better done in some respects; but the admirable wall maps of Kiepert, published by Reimer of Berlin, cannot fail to arrest attention. There is an excellent school atlas by Diehl, of Darmstadt, price 1s. 2d.; and another by Haester, still cheaper. The reading-books, carefully prepared in a graduated series by the teachers of the Munsterberg Normal School, are marvellously cheap. So also are the very complete sets of arithmetics by Bohme, used all over Prussia. Bohme also exhibits some curious tin slides, to be used in infant schools instead of the ball-frame.

A school at Ahrensberg sends a quantity of needlework, done by the scholars, of the highest excellence, and giving evidence of very sensible teaching—no fancy work, all of the plainest utility.

(1) Last month a law was passed requiring all communes of more than 500 inhabitants to have a separate *girls' school* under a mistress, and all smaller communes to provide a sempstress for their mixed schools.

(2) The bookkeeping of the French tradesman is almost entirely intrusted to women.

Diagrams for teaching the working of pumps, &c., and of the electric telegraph, may be seen on the walls,

III. SAXONY.

In a little temple in the Park is a modest but very excellent exhibition of school books and apparatus sent by Saxony, the cradle of German education; for here in the sixteenth century were sown the seeds of that system of popular instruction which has since spread over Germany. In the centre is a model of the Gymnastic School of Dresden. On the counters and walls are to be found Lange's excellent atlas (Leipsic), giving a full account, physical and commercial, of Saxony; Delitsch's elementary Atlas of the world, a marvel of cheapness (six maps for 14d.); Luben's Atlas of Botany, which they seem to teach carefully in the Saxon schools; Schnorr's Bible woodcuts; and much else worthy of attention.

IV. SWEDEN.

The Swedish Government has furnished the lower chamber of a most picturesque little wooden house so as to represent one of their small village schools. Since 1842 education has been obligatory in Sweden; the entire absence of dissent makes it possible for the Government to work the schools through the ecclesiastical organisation of the country. Each parish is rated according to its requirements, as reported by the clergyman and approved by the inspector. If we may judge by what is here seen, the furniture is of an almost sumptuous kind. Each child has a small desk and seat to himself; the desk holds his books, &c.; the seat has a back. The teacher thus passes freely among all the children. In the larger schools of more thickly-peopled countries this would be, of course, impossible.

The maps of Scandinavia are, perhaps, the most striking school maps in the whole Exhibition. They are by Mentzer (No. 11). The stove is of earthenware, as in their houses, warming the air by conduction, not by radiation.

V. DENMARK.

From Denmark I find a very complete collection of scholars' work from the various primary schools of Copenhagen. The boys' drawings and writing books are good, the girls' needlework admirable. In all the schools the English character of writing is taught as well as the German.

An excellent adult night school, supported by voluntary subscriptions, for teaching drawing, also sends good results. In England a school for teaching drawing would hardly draw forth the charitable contributions of our gentlefolk.

VI. AUSTRIA.

The well-stored assortment of school apparatus sent by the Austrian Government is nearly all under glass, and difficult to examine.

The best globes of every size and price are from Austria. Steinhäuser's maps of physical geography, Frobel's "Kindergarten," Patek's apparatus for teaching arithmetic, from the St. Anna School at Vienna, all deserve notice. I never saw in an English school the Vienna frame for teaching vulgar fractions. It is like a ball-frame, only on the wires, instead of balls, you have divisible reeds. The uppermost is undivided, and represents the integer. From those below, which are divided into fractional parts, and run on the wires, the child sees at once that three fourths are equal to six eighths, greater than two thirds, less than four fifths, &c.

In large portfolios are to be found specimens of drawings in every stage. Better methods of teaching drawing in connection with ornamentation can hardly be conceived. In this respect the Austrian exhibition seems to me unrivalled. I may also mention very cheap telluriums and planetariums, from 30s. to £5, sold by Felke of Prague. By lighting the lamp and turning the handle, the whole theory of day and night, of the seasons, and of eclipses, is shown to the child at once. One of the cheaper sort might well be in every village school. All the Austrian school apparatus seems to be far cheaper than that of France or England.

VII. SPAIN.

In the upper room of an elaborately carved and turreted house in the park is to be found the Spanish school exhibition. Without an interpreter it is difficult to understand it. The eye is at once caught by a school-desk, long enough for five children, supported by five simple cast-iron standards. Instead of a bench, as in England with all the attendant inconvenience of stepping over, there are five round seats, each seat resting on a continuation of the iron standard, like so many music-stools before a pianoforte. When the class is told to stand, each child stands at once by the side of his seat, and can leave or resume his place without difficulty. When used for needlework cushions are attached to the desk, to which the girls may pin their

work. Under No. 87 will be found a cheap box of geometrical solids of walnut-wood, the best perhaps in the Exhibition. Moreuilla's method of teaching reading (No. 73), and Iturzaeta's writing copies (No. 91) appear to be good. Advendano (No. 88) is their great publisher of school books at Madrid; and Bastinos, of Barcelona (No. 34), is a well known house for all sorts of school apparatus. There is a society (or junta) of noble ladies at Madrid who maintain a Normal School, and have founded numerous elementary schools, also represented, though inadequately, in this Exhibition.

VIII. ITALY.

The exhibition from Italy indicates a rapid and satisfactory progress in the last few years. The Minister of Instruction and Worship sends a very complete assortment, including a full account of their recent legislation in favour of education. Paravia the great publisher at Turin, sends text-books of every sort; those of Lambruschini and of Carbonati are reported to be excellent. Perrin of Turin (No. 13), sends copy-books, as good as any in the Exhibition, to be had for half the cost of English copy-books. Luca, of Naples (No. 38), sends very good books on geography. All their older educational societies have recently consolidated into the Italian Association for the Education of the People, which (under No. 2) exhibits good evidence of progress. The architectural and ornamental drawings from the Schools of Naples, Venice, and Padua are most beautiful.

It is to be regretted that some other countries, in which education has already made and is now making great progress, are so inadequately represented.

BELGIUM sends but little:—The school-books of Braun (No. 2) and of Willequet (No. 16), Joly's Atlas (No. 11), and Callewert's (No. 3), should be noticed.

HOLLAND and SWITZERLAND, both nations honourably distinguished for what they have accomplished in the cause of popular education, send nothing.

CANADA sends excellent school-books (note especially, the commercial copy-books) from the Upper Province, and School apparatus from the Lower. There is also an interesting model of the village of St. Anne showing the great agricultural school and its system of husbandry. The model was made by the teachers of the institution.

UNITED STATES OF AMERICA.—Nothing belonging to this Class had arrived at the date of this report (May 14).

Such are my principal gleanings from my month's study of this portion of the Exhibition. But, in conclusion, I must record my strong impression that any educational exhibition of this kind must be, from the nature of the case, unsatisfactory. As a test of comparative progress, it is clearly untrustworthy. Nations whose administration is highly centralised are sure to appear to advantage as compared with those which trust chiefly to voluntary effort. And of the work done it is the *material*—i. e., the least important—results only that can be properly represented. How, for instance, can a teacher's success as a disciplinarian be made to appear in such an exhibition? Even of the mechanical appliances a trustworthy judgment can hardly be formed unless one has a practical teacher by one's side to answer the question, "How do they work?" And of the real tools of a teacher, his school books, it is of course impossible to make any profitable examination while standing before a glass case. Still Class 89 contains abundance to interest an English schoolmaster, and the above report may perhaps help to direct him to what will best repay his attention.—*Report to committee of council on Education.*

An Imperishable Unit of Length.

THE METRIC SYSTEM.

The hope of furnishing an unchangeable unit of length appears to have often exercised the thoughts of the wisest and most learned as well as the most powerful men in times past. The cubit and other ancient measures were well understood to have retained no exactitude more than a thousand years ago although some of them were nominally preserved. As civilization slowly progressed under various influences the want of some definite unalterable standard or unit became more and more felt. In some cases, for a time at least, the want seemed to be supplied either by means of some ingenious recourse to natural objects supposed to be constant in form and size or by some arbitrary standard fixed upon under circumstances imagined adequate to secure permanence. Thus Charlemaigne, finding that the problem was insoluble in his day ordered the measurement of his own foot, inclusive of the polished steel shoe taken worn, to be used as a standard of length and to be correctly marked inside public monuments to secure its preservation; and Edward the first of England proposed the adoption of the length of his arm to be the standard yard. But in course of time not only did the models of the

"King's foot" vary in all European countries, as well as the yard and its subdivisions in nearly all the counties of England, but the originally executed models and standards and the perishable monuments on which they were marked were rendered useless or utterly destroyed by accident or the irresistible process of oxidation, while the very bones of the monarchs who had thought to have furnished mankind with permanent measures were reduced to dust.

The natural standards had recourse to by the Anglo-Saxons were seen to be no more permanent—their notion of founding measures of length upon the constancy in size of grains taken from certain parts of the ears of wheat or barley being quite fallacious.—

Up to about 1790 indeed no certain standard of length was devised, and then originated in France the "metrical system" founded on assuming as unit the *ten-millionth part* of the distance on a meridian from the earth's equator to the pole. So far as we know, there has been no appreciable diminution or increase in the earth's dimensions from the earliest periods of time and consequently the above named unit, called the "Meter", may be taken to be as unalterable as the magnitude of the globe itself.

The precise length of the meter, so far as ascertained, may be stated at 3.28 feet or 3 ft. 3¼ inches English. The meter governs the dimensions of the other units, as of surface, solidity, weight, as well as those for measurement of liquids and computation of money. Thus the *Are* is a square whose side is ten meters, being the unit of surface; the *Stere*, unit of solidity, is a cubic meter; the *gramme*, unit of weight, is the weight of a cube of pure water whose side is one-hundredth part of a meter; the *litre*, unit for liquids, is a cube whose side is the tenth part of a meter; and the *franc*, unit of money, is five grammes of a metallic mass consisting of silver with one-ninth of copper.

Tables of weights and measures constructed on this basis constitute the Metrical System now in use in some other countries as well as France.

A similarly imperishable unit for weights and measures has been devised and employed in England different in principle from that which has been described though, curiously, enough, of nearly the same magnitude, a brief account of which will be given in a future number of the journal.

M.

Thirty-Second Conference of the Teachers' Association in connection with the Laval Normal School.

Held 30th. and 31st. August 1867.

FIRST SITTING, (Evening) 30th., 7 P. M.

Present: Mr. F. X. Toussaint, President; Messrs. N. Lacasse, N. Thibault, J. B. Cloutier, D. McSweeney, C. Dufresne, G. Labonté, F. Pagé, C. Bouchard, J. Cloutier, S. Fortin, L. Blanchet, F. Morisset, A. Trepanier, and J. Poliquin.

The minutes of the last meeting were read and adopted.

In the absence of the Secretary, (Mr. L. Dion), Mr. L. Blanchet was requested to act as Secretary.

The President said a few words on the progress of Public Instruction, followed by Messrs. Lacasse, Thibault, and Dufresne, on the same subject, the discussion of which was adjourned to the following day at 9, A. M.

Morning Session of the 31st. 9 A. M.

Present: Mr. F. X. Toussaint, President; Mr. L. Blanchet, Sec., *pro temp.*; Messrs. N. Lacasse, J. B. Dugal, G. Labonté, N. Thibault, B. Pelletier, D. McSweeney, M. Ryan, F. Fortin, S. Fortin, F. Pagé, F. X. Gilbert, C. Dufresne, L. F. Thardif, L. Ouellet, J. Cloutier, J. B. Cloutier, C. Bouchard, Jos. Pelletier, C. Labrecque, C. Chartré, M. Ahern, F. Morisset, and L. Lefebvre.

The minutes of the previous evening Session were read and adopted.

The meeting expressed themselves highly pleased with the statement of their finances, just read by the Treasurer, Mr. N. Lacasse.

They then proceeded to the election of officers, the result of which was, that Mr. Bruno Pelletier was elected President; Mr. F. X. Gilbert, Vice-President, and Mr. Lefebvre, Secretary.

Mr. N. Thibault proposed, seconded by Mr. N. Lacasse, that Mr. J. B. Cloutier be elected Treasurer, and that the following gentlemen be a committee; Messrs. C. Dion, F. Fortin, G. Labonté, F. X. Toussaint, D. McSweeney, M. Ryan, J. B. Dugal, C. Dufresne, and J. Letourneau, which motion was agreed to.

Mr. F. X. Toussaint spoke of several treatises on Geography, which at the time of their publication were quite correct, but which are,

to day, defective in many respects; from this standpoint he made a strong case, in favor of a new treatise on the subject in harmony with recent political changes, and discoveries.

Proposed by Mr. Thibault, seconded by Mr. Napoléon Lacasse, and

Resolved: That the thanks of the Meeting are due, and are hereby tendered to the outgoing officers for the able and faithful manner in which they acquitted themselves of their respective duties.

The following gentlemen, Messrs. L. F. Thardif, M. Ryan, and Norbert Thibault, promised each to prepare a lecture for the next meeting.

The following subject was proposed for discussion at the next conference:—

"Is it expedient that Teachers should interfere in Politics?"

The adjournment of the Meeting was then moved until the last Friday in January at 7 P. M.

B. PELLETIER, Président.
L. LEFEBVRE, Secretary.

Extracts from the School Inspectors' Reports.

Extracts from Mr. CRÉPAULT'S Report.

COUNTIES OF BELLECHASSE, MONTMAGNY AND L'ISLET.

(Continued.)

St. Charles.—There are nine schools in this municipality. The model school is taught by a pupil of the Laval Normal School (Mr. Gagné), gifted with a rare talent for enforcing order and discipline among his pupils who make great progress. This gentleman is held in general esteem.

Mlle. Couture has presided over the superior school for girls for twelve years, with unvarying success and great talent. She likewise receives boarders, and has a great number. Rev. Mr. Martineau, the *curé* of the place, takes the direction of the school commissioners in virtue of his great knowledge and experience. The finances are in a prosperous state; the other schools, seven in number, are well kept.

St. Gervais.—This municipality maintains 12 schools. The model school is conducted by Mr. Bouchard, who was a pupil of the Laval Normal School, and fulfils his duties to the satisfaction of all concerned. The girls' department is intrusted to the ladies of the convent of *Jésus-Marie*, whose acquirements, zeal and the general respect felt towards them, exercise the happiest influence over their pupils. Rev. Mr. Pouliot, *curé* of the parish, and one of the founders of the institution, is its careful director. The other schools are pretty well kept; the commissioners are making praiseworthy exertions to release themselves from the difficulties entailed on them by former mismanagement, and I have reason to believe that aided by their clever secretary-treasurer, Mr. Labrègue, they will, before long, be in a prosperous condition.

St. Lazare.—This municipality supports six schools. That at the church is taught with great success by Mr. Bourassa, who is much esteemed in the district. Misses Pouliot and Vallières also keep a good school. The municipality, though poor, has always kept its affairs in good order.

Township of Buckland.—This township has only a single school taught by Miss Nadeau. The large number of scholars attending it is a proof of her efficiency and success. The people are earnest in their zeal for education.

Township of Armagh.—This township has two schools kept by persons of mediocre capacity, who are however competent to perform their functions in a young municipality; and there is evidence of great zeal if we consider the slender resources of the inhabitants.

St. Raphaël.—There are five schools in this parish, all well kept, and perfectly sufficient for the wants of the district. Miss Roy, the teacher of the Sault school is entitled to all praise. Mr. Courcy likewise is a skilful teacher. The commissioners discharge the duties of their office with exemplary punctuality, and are not in debt.

St. Michael, No. 1.—In this municipality we find a commercial college, an academy for girls and an elementary school. The college is at present under the direction of Mr. Laferrière, a young man of talent and promise, trained in the Jacques Cartier Normal School. Miss Gosselin conducts the education of the girls with anxious solicitude. In both establishments, besides the ordinary matters, instruction is given in linear drawing, vocal and instrumental music, mensuration and geometry. The municipality has at its head men who conduct its affairs very successfully. I consider it as the pattern-district in my inspectorship.

St. Michael No 2.—This municipality has three schools all well kept. I owe honorable mention to Misses Toussaint and Couture, and

to Mr. Dessin. The affairs of the municipality are in good order, and there is no debt.

St. Vallier.—This municipality keeps up five schools. The girls' school is taught by the Misses Bélanger, one of whom was educated at the Laval Normal School. They receive boarders, and find great encouragement. Mr. Sylvain, the teacher of the boys' school, is very successful. I regret that the remuneration accorded to the Misses Bélanger and Mr. Sylvain does not correspond with their merit.

The three other schools are of a middling order. The commissioners consider economy too closely in making their engagements. This municipality has but little debt.

Berthier.—In this little municipality there are but three schools in operation; one model and two elementary. Miss Boulé, who presides over the model school, was a pupil of the Laval Normal School. Her school is well kept, and is attended by seventy-five scholars. The success of the Misses Robin and Lavallée, who teach the two other schools, is satisfactory. The affairs of the municipality are in good order, although there is still a little debt.

St. François.—This municipality keeps up five schools, all elementary. That taught by Monsieur Langlois, a pupil of the Laval Normal School, is but poorly attended. This is caused by a division in the parish respecting the site of the school-house. The party worsted in the dispute took away the children and will not allow them to return. Miss Boulé, who keeps the *Coteau* School, deserves honorable mention. Miss Talbot is also a good teacher, but her pupils do not improve as they ought, on account of their frequent non-attendance. The convent of the Sisters of the Congregation, long established in this parish, is more and more satisfactory in the effects of its tuition. The commissioners do their duty, and the finances are in good order.

St. Pierre.—This parish keeps up a model school and three elementary schools. The former has been taught, during the past year, by Miss Lachance, a pupil of the Laval Normal School. The scholars of Miss Boulé, who kept the school on the north side of the river, regret to lose her, she being obliged to leave on account of ill health. The two other schools are tolerably well kept. The commissioners generally defer to the advice of the Rev. Mr. Morin, *curé* of the parish, and are the better for it. Their pecuniary affairs are in a flourishing condition.

St. Thomas.—There are nine schools in operation in this place. The academy for boys is under the control of the brethren of the Christian Doctrine. In addition to the ordinary branches, they teach English, linear drawing, vocal and instrumental music, mensuration and geometry. The pupils under their care have always made great progress. The religious ladies of the Congregation have two hundred young girls under their care, to whom they teach English, music, worsted-work and needle-work, and epistolary writing. The convent is well kept and enjoys a high reputation. The two Misses Dairie and Miss Colin, are entitled to particular praise as teachers. The school municipality is managed by talented and zealous persons. It is in debt, but the accounts are well kept.

L'Isle aux Grues (Crane Island).—This municipality has two schools which work very well. The centre one, which may be looked upon as a superior primary school, is managed by Miss Painchaud. This young lady refuses no sacrifice when the improvement of her pupils is in question. In truth the sacrifices which she has made have been hitherto well repaid by constant success. The commissioners are intelligent and enlightened, and their affairs are in good order.

Cap St. Ignace.—Cap St. Ignace maintains eight schools. The model school is under the direction of Miss Fournier, a former pupil of the Laval Normal school. Her pupils make satisfactory progress. The other schools are perfectly suited to the wants of the locality. Although the school-law was put in force here at a later period than in other municipalities, the schools are, nevertheless, on a par with those of the other parishes. The affairs of the commissioners are in good order and well managed.

St. Cyrille.—This municipality, in which many persons have scarcely the means of living, is enabled by great sacrifices to maintain two good schools taught by well-qualified teachers. The accounts are well kept.

L'Islet.—This large municipality has thirteen schools in operation, two of which are superior primary or model schools—one for boys, and one for girls. The former is under the charge of the Brethren of the Christian Doctrine. The girls' school is under the direction of the Misses Languedoc. One of the latter is a late pupil of the Laval Normal School. Their classes are well kept, and the parents are satisfied. Miss C. Fortin, who keeps the school at the extremity of the 1st range, is remarkable for her skill as a teacher; her pupils make astonishing progress. Misses Boucher and Poitras have also an excellent school. All the other schools in the municipality are likewise well kept. The commissioners, guided by Rev. Mr. Delâge,

curé of the parish, discharge their duties in an efficient manner. Their finances are in the most flourishing condition.

St. Aubert.—This municipality maintains five schools, all well conducted. The Misses Langlois are remarkable for the improvement of their pupils. Rev. Mr. Fortin, the *curé* of the parish, is the mainspring of all progress in this district, which is comparatively poor and new. The finances are in a prosperous state, and the accounts are well kept.

St. Jean Port Joly.—This municipality has nine schools in operation. The model school is under the management of Miss Dumas, a distinguished pupil of the Laval Normal School. She has remarkable success. The other schools have also for several years past been in a prosperous condition. Rev. Mr. Parent has not a little contributed to the progress of the parish in this respect. The finances, which are administered by a clever secretary, the notary Verrault, are in good order.

St. Louise.—This municipality has three schools in operation. The most flourishing one is that near the church, kept by Miss Pelletier. The others are also well kept. The Rev. Mr. Casgrain, *curé* of the parish, evinces great zeal in the cause of education. The affairs of the municipality are in good order.

St. Roch des Aulnais has eight schools. That which is known by the name of the Mill School is under the direction of Miss Chèvrefils, a skillful teacher, who has had long experience; her pupils have always made great progress; she teaches English with much benefit to her pupils, it is as familiar to her, as French. The other schools are all kept by good teachers, among whom Miss Pelletier is distinguished. The parish is greatly indebted, in respect of education, to Rev. Mr. L. P. Chiniquy, who for some years past has generously devoted himself to the success of the cause. The finances are in good order.

Extracts from MR. BÉLAND'S REPORTS.

1863.

COUNTIES OF BEAUCE AND LOTBINIÈRE.

Mr. Béland states that school attendance has diminished ten per cent in this district; which he attributes to the establishment of independent schools. Notwithstanding this falling off he believes he has reason to be proud of the progress of education in his district. In the nineteen municipalities which comprise his district, there are 126 educational institutions of all grades, in which 6639 pupils receive an education sufficiently adapted to their several wants. Of the above number of institutions 105 are under the Inspector's control; the remainder are independent.

St. Jean Deschailions.—Three hundred and fifty children are attending the schools of this municipality.

Lotbinière.—This parish is divided into three municipalities, with 839 pupils attending the several institutions, the convent, the college, and 17 Elementary schools.

St. Croix.—There are, in this municipality, ten schools attended by 375 children. Results very gratifying.

St. Flavien.—Counts five schools.

St. Antoine.—Has a good Model School, and seven Elementary ones, all reflecting great honor on the municipality.

St. Appollinaire.—Counts five schools, regularly attended by 500 children.

St. Gilles.—There are two schools in this parish, but the voluntary system militates materially against the progress of education.

St. Agapit.—There is only one school (very well conducted) in operation in this municipality.

St. Agathe.—Nos. 1 and 2. *St. Sylvestre, North and South, St. Marie (Beauce), St. Elzéar.* These six municipalities have very good schools, but unfortunately they adhere to the voluntary system which considerably retards that progress which we have a right to expect.

St. Joseph (Beauce).—There are here eleven schools, seven under control and four independent, all of which are very well conducted.

St. Frédéric.—The schools of this municipality are very good, but there are serious drawbacks in the way of good schoolhouses.

St. François.—Has nine schools, all on a good footing, and attended by 420 children.

St. Georges.—Counts six schools all flourishing.

Metzchermette.—Has one Protestant school, well conducted. The catholics must also soon establish one.

1864.

I have the honor to send you, together with this report, statistical tables of my district of inspection, for the year 1864.

The schools in my district work satisfactorily in every respect. The school commissioners generally acquit themselves well of their duties. The secretary-treasurers keep their books in regular order.

The teachers' salaries are generally too low, and do not suffice to enable them to live decently. I fear too, that the rate payers will never trouble themselves to improve this state of things. I have encouraged the teachers to carry out a scheme which they have formed of petitioning the legislature, which alone has the power to do them justice. The majority of them agree to receive salaries far too low, and altogether disproportioned to their capacity and the value of their labors.

St. Jean Deschaillons.—This municipality has, at last, succeeded in paying up its arrears, and affording a liberal support to its schools, which are all kept on a respectable footing. The model school, kept by Mr. Pageau, does great honor to the teacher and the parish. The teachers in the other school districts discharge their duties with no less zeal than success. The secretary's books are well kept.

Lotbinière.—This parish is distinguished by its numerous and good schools, and particularly by its convent, its academy for boys, and its model school: these three institutions are well kept, and of incalculable benefit to the parish, and to the surrounding neighborhood. The rate-payers and the Reverend *curé* Faucher particularly, submit to greatest sacrifices for the support of these three institutions. The other schools in the municipality also work in a satisfactory manner. The secretary's books are kept in good order.

St. Emilie.—This new parish, formed of a dismembered portion of that of Lotbinière, has four schools. Mr. Joly also maintains in it an independent school of the first class.

St. Edouard.—This municipality, like that of St. Emilie, numbers four schools, which are well kept.

St. Croix.—This municipality keeps up ten good schools. Its convent enjoys a high reputation which it well deserves. Mr. Durocher manages the boys' school very skilfully. The other schools are taught by female teachers. The books are well kept.

St. Flavien.—The five schools in this municipality are all good. The teachers are paid regularly. The commissioners have appointed a new secretary-treasurer in the present year.

St. Antoine. This municipality maintains (to its honor be it said) a model school and seven good elementary schools. The teachers emulate each other, and their efforts produce the happiest results. The model school is kept by a young person belonging to the parish who holds a diploma from the Laval Normal School.

St. Apollinaire.—This municipality has five schools, which are well kept. The finances are in good order.

St. Giles.—This municipality keeps two schools on a good footing.

St. Agapit.—This municipality has only one school but that is well kept.

St. Agathe, No. 1.—This municipality has also only one school attended by a great number of scholars.

St. Agathe No. 2.—This municipality maintains three good schools.

St. Sylvester, North and South.—The law is always difficult to be enforced in these municipalities. There have been, nevertheless, as many as twelve schools, some of which were not devoid of merit.

St. Marie de la Beauce.—This municipality has nine schools presided over by zealous and efficient teachers. The convent and school of the Brethern of the Christian Doctrine, afford the children who attend them a good education.

St. Elzéar.—This municipality is contumacious on the subject of school taxation. Had it not been for the generous sacrifices of the Rev. Mr. Grenier *curé* of the parish, who maintains seven schools, this place would be destitute of any educational institution.

St. Joseph.—Numbers eleven schools, seven of which are well kept. Those intrusted to the Misses Cazeau, Robitaille and Poirier, are schools of the first class. The four others without being as remarkable, nevertheless suffice for the wants of their districts. The secretary performs his duties well.

St. François.—This municipality maintains twelve schools, nine of which are well kept. Those taught by the Misses Anger, Baudoin, de Tonnancourt, and Bourque, are entitled to particular mention. The others have also their degree of merit. The secretary-treasurer keeps his accounts correctly.

St. Frederic.—This municipality is one of those in which the education of the children makes the greatest progress. Its six schools are good and well kept. The Rev. Mr. Moore, *curé* of the place, watches their proceedings with a vigilant eye. The secretary performs his duties satisfactorily.

St. George.—This municipality keeps up six good schools. The *curé*, the commissioners and the secretary, emulate each other in their zeal for the interest of education.

Metzhermette.—The English school is well kept. If the municipality is divided, as it is hoped that it will be very shortly, a French school may perhaps be established.

Extract from M. JUNEAU's Report.

COUNTIES OF LÉVIS AND DORCHESTER.

I have the honor to transmit to you herewith a report of my two last visits to the various educational establishments in the counties of Lévis and Dorchester. My inspectorship now comprises one college, three convents, two academies, eleven model schools, three dissentient schools, seventy-eight elementary schools, and twenty independent schools, all which institutions are attended by 8504 scholars of both sexes; 4119 male children and 4385 girls, being an increase of 642 over the preceding year. I found with pleasure that the pupils of almost all the schools had been more attentive than formerly. I have ascertained that the average attendance of children at school was 6433.

If we look back at the statistics of 1860 we shall find that there were at that time no more than two convents and four model schools in my two counties; there are now three convents and eleven model schools.

In my two last visits I distributed 227 prizes. These rewards excite great emulation in the schools, and it is to be regretted that we cannot give a larger number. I thought it my duty to suggest and strongly recommend the school commissioners to subscribe to the *Journal of Public Instruction*, for the use and in the name of the respective school municipalities, to the extent of as many copies as there are school districts. I pointed out to them the numerous advantages which would result from the perusal of that excellent publication, with respect both to the orderly conduct of their schools, and the moral behaviour of their pupils; that masters and mistresses may constantly find in it useful suggestions and different methods of teaching; that the *Journal of Public Instruction* would be, as it were, a second normal school to those who are now, and will hereafter be, intrusted with the management of schools. I told them moreover, that in that publication we find excellent and choice pieces of literature, many of which might be studied for the examinations; in short, that masters, pupils and parents themselves would be the better for it—the first by perfecting themselves in the difficult art of teaching, the second by studying under better taught, and therefore more skilful, masters, and the parents because the progress of their children would be more rapid.

St. Nicholas.—The schools of this municipality are well kept, with the exception of that of district No. 5, the teacher of which although tolerably well informed, has not a talent for teaching, and the pupils make but little progress. The commissioners have promised not to engage her another year. The model school for girls is still well kept. The examination at the academy for girls has again shewn to the numerous visitors the excellence of the system of tuition; the pupils having evinced a great amount of progress.

St. Etienne.—This young municipality is divided into four school districts, and there are three schools in operation, two under control and one independent. School No. 1 has been ill kept and the scholars have certainly lost their time. The mistress was to be changed after the vacation.

St. Romuald.—All the schools in the municipality are well kept. The dissentient school at this locality is at last provided with a good master, a pupil of the McGill Normal School, Mr. John R. Loyd.

Village of Elchemin.—The schools of this populous village are admirably kept and regularly attended by a great number of scholars. The two last named municipalities employ none but qualified teachers educated at the normal schools, and all goes well with them.

St. Henri.—The ten schools of this fine large municipality are all well kept, several of them very well. The excellent model school is highly honorable to the community.

St. Jean Chrysostome.—I had reason to be satisfied with all the schools at this place. A model school was opened in July last.

St. Lambert.—The schools of St. Lambert are kept on a good footing, especially the model school. In this municipality the teachers and pupils emulate each other, and labor with untiring energy, but their zeal is tempered with kindly feeling, and a spirit of conciliation. Miss Praxide Fournier was to quit the Parish after the vacation to enter a religious community. This young person has, by her talent, her piety and gentleness, gained the esteem of all the parish, and goes away bearing with her the blessings of all the inhabitants.

St. Joseph de Lévis.—This fine parish has good elementary schools and excellent institutions for superior primary education. The convent is conducted with exemplary care, and is accordingly attended by children of the first families, both French and English.

Lévis.—The town of Lévis likewise possesses excellent institutions for superior primary education, which leave nothing to be desired in respect both of instruction and of comfort. The elementary schools are on a good footing and regularly attended by a considerable num-

ber of children of both sexes. That of the Misses Lefebvre has not less than 148 scholars.

Notre Dame de la Victoire.—The schools in this parish are all well kept and regularly attended. The model school, kept by Mr. F. Letellier, has made extraordinary progress although attended by 146 scholars.

St. Isidore.—I was satisfied with the manner in which the schools of this place are kept, particularly those taught by Misses Boutin and Turgeon.

St. Bernard.—I visited this parish about the 15 of June last, and found all the schools closed. The final examination had taken place two days before my arrival. It was said the progress of the pupils had given general satisfaction. I informed the secretary-treasurer of my intention to visit the schools of the neighborhood in the autumn. I told him also that it would be better to fix the vacations at the same time adopted by other municipalities, that is to say during harvest, that by fixing the time as at present at the end of the school year, they caused the children to lose a great deal of time; as after their holiday months in June and July, they do not return to school until after harvest. The secretary, who is a judicious person, promised to use his influence to induce the commissioners to remove the inconvenience.

St. Anselme.—The schools of this large municipality are all well kept. The convent of the Reverend Sisters of *Jésus-Marie* seems to promise brilliant results. The same system of tuition is adopted as that of *St. Joseph de Lévis*. I regret that for the present year, the model school for girls has been suspended. I believe it will be found necessary to resort to the compulsory system of taxation, as the only means of keeping up good elementary schools at all times, as well as a good model school for boys in the school district at the church, which does not now exist. The want of such a school is the more severely felt just now that its advantages are understood.

Ste. Marguerite.—Of six schools in this municipality, two only are kept by teachers who have diplomas, nevertheless, I was satisfied with the progress made by the pupils, particularly by those of the schools kept by the Misses Philomène Boutin and Vaillancourt. In the school kept by the latter, I saw fifteen children who had learned to read in the short space of three months. The curé of this parish has a thousand difficulties to contend with in keeping up his schools; there, too, it shall be necessary to have recourse to compulsory contributions. I set about preparing the inhabitants for this, and it was no slight affair, I assure you.

Ste. Hénédine.—The schools of this little place are well kept and regularly attended.

Ste. Claire.—The model school of this parish is still well taught and attended by numerous pupils. I am also very well satisfied with the elementary schools, although several fall short of my expectations. In general, the accounts of the secretary-treasurers are well, conscientiously, and intelligibly kept in my district, method alone is wanting in some of them. This report is accompanied by a comparative statement of superior instruction in the counties of Lévis and Dorchester, for the year 1860 and 1864.

I shall have to distribute, in my approaching visit, 59 volumes remaining from the year before last, and 264 volumes remaining from the last.

In my last visit, I received no particular complaint relative to the schools.

Extract from the Report of Inspector HUME.

COUNTY OF MEGANTIC AND PART OF THE COUNTIES OF DORCHESTER AND BEAUCE.

SIR,—I have the honor to make the following report of the progress of education in my district of inspection, making, as usual, some observations upon the scholastic affairs of such municipality, commencing with those in the county of Beauce.

COUNTY OF BEAUCE.

St. Victor de Tring.—There have been four schools in operation in this municipality under the control of the commissioners, but one had been closed at the time of my last visit. Since the month of July last, there was also an independent school in a remote part of the municipality. The present teacher of the chief school is much better qualified than several of her predecessors were, and considerable progress has, in consequence, been made by the pupils. In the other schools no unusual progress has been made. The commissioners have changed their secretary-treasurer; the newly-appointed one appears to keep his accounts with regularity. A considerable portion of arrears of assessment has been collected. A new schoolhouse has been built in the principal district, which was much wanted, the old one being unfit for the accommodation of the pupils.

St. Ephrem de Tring.—Some change has been made in the limits of this municipality by an Act of Parliament passed in 1863, dividing the township of Tring into two municipalities, which took effect from the first of January last. The annexing of a part of the sixth range (which formerly formed part of *St. Victor*) to *St. Ephrem* is a great advantage; it has enabled the commissioners of the latter place to establish a school in that range, where none had been for a number of years, part of the inhabitants of the range having previously belonged to one municipality and part to another. Three schools are in operation with qualified teachers, but one district is still vacant. There was also an independent school kept during a period of the year. Although many of the inhabitants are poor, I am happy to say that the amount owing by the commissioners is much less than it was last year, and that the arrears of assessment due have also decreased.

Forsyth.—There are two schools in operation, and it is in contemplation to establish another one. One of the schools has been well attended and some progress made, but at the other the attendance has been, as usual, very irregular. The commissioners are entirely free from debt, and but a very small amount of arrears is due by the inhabitants.

Lambton.—In this municipality there is nothing of any importance to record since the date of my last report. There are two schools, with the same teachers who were engaged last year; both of them are well qualified, and the schools were numerously attended, and much progress made. The amount of arrears due is much the same as it was last year.

Aylmer.—There are four schools in operation in this municipality; the teachers are all very well qualified one of them has a diploma from the Laval Normal School. Some progress has been made in those schools where there has been a good attendance; but in one or two the pupils attend very irregularly, especially in the summer season. The commissioners have paid a considerable portion of their debt, and the arrears of assessment due are less than they were last year.

Shenly.—I regret to say there has been no school in operation in this municipality this year; being a new settlement, and the inhabitants being, from various causes, very much dispersed, there is scarcely a sufficient number of children within a reasonable distance in any locality to form a school. The inhabitants are also, in general, very poor.

Broughton.—In this municipality the school commissioners have determined to support their schools by assessment, and the rate has been levied for that purpose; but as circumstances delayed the imposing of the rate, scarcely any of it has yet been paid.

This resolution encountered great opposition from a certain number of the ratepayers, but it has now almost entirely ceased. The curé of the locality, the Rev. Messire Huot, has displayed great zeal for the advancement of education. Two female teachers have been engaged by the commissioners, one of whom holds a diploma from the Laval Normal School, and the commissioners propose to engage several others next year.

In this municipality the Protestants are dissentients, and they have a school in operation which is attended by a great number of pupils. They have also adopted the system of assessments. They have collected a portion of the taxes imposed for the present year. During a certain portion of the year there has been an Independent School in operation in this municipality.

COUNTY OF DORCHESTER.

West Frampton.—There are only two schools in operation in this municipality, and one of these had been abandoned by its teacher a short time before my arrival in October last, and her successor has not yet been appointed. A female teacher had been engaged by a certain number of French Canadians who reside in this municipality; this teacher was to open her school on the 1st December last. There is no dissentient school in this municipality, the dissentients not being in a position to pay for a teacher. The Rev. Mr. Rousseau, the chairman of the commissioners, makes the same complaint as Mr. Paradis, of the impossibility of obtaining competent teachers. The school in operation at the time of my last visit was attended by a large number of children, and considerable progress had been made.

Standon.—Since the appointment of the present teacher the school in this township has been attended by a large number of pupils, and I remarked very satisfactory progress. I have every reason to believe that another school will soon be opened in the back concession, in which hitherto the inhabitants have been too poor and too scattered to maintain a school.

Crabbourne.—There have been three schools in operation in this municipality at different periods of the year, but none of the teachers held diplomas. When I inspected the municipality last year one of the teachers intimated his intention of going to Quebec for the pur-

pose of obtaining his diploma. He did, indeed, go, but he never returned. I cannot say whether he underwent the examination, but he certainly did not obtain a diploma. A certain number of Protestants have been dissentients for some years past, and have established a school, which has been in charge of a young married woman of very limited capacity. She intimated her intention of trying to obtain her diploma, and I obtained for her the books containing the information requisite for candidates. I have advised the commissioners to establish the system of assessments, but throughout the whole county I have encountered obstacles to the establishment of this order of things.

The commissioners informed me that they experienced great difficulty in obtaining very competent teachers at the salaries they could offer. I have endeavored to engage a certain number of teachers in the county of Megantic, to go and teach in those municipalities, but the low salaries offered and the remoteness of the localities have led them to refuse my offers.

(To be continued.)

MONTHLY SUMMARY.

EDUCATIONAL INTELLIGENCE.

Mr. EWART'S Bill, to extend the benefits of Education in the Universities of Oxford and Cambridge to students not belonging to any College or Hall, was read a second time on Wednesday, the 3rd July. It gave rise to an animated discussion, which ended in the second reading being carried by a majority of 164 to 150; and the Bill was then ordered to be referred to a Select Committee, which has now been sitting for some weeks, and is likely to be engaged for some time to come in collecting evidence on the subject. The Bill provides, that "Notwithstanding anything contained in any Act of Parliament now in force relating to either of the Universities of Oxford and Cambridge, or in Statutes, Charters, Deeds of Corporation, or other instruments of Foundation of either of the said Universities, or of any College or Hall within the same, any person may be matriculated without being entered as a member of any College or Hall and may, if he shall think fit, join himself to any College or Hall with the consent of the head thereof, but without being obliged to reside within the same, and every person so matriculated shall in all respect and for all intents or purposes be and be considered as a member of the University, and upon joining any College or Hall shall in all respects and for all intents or purposes be and be considered as a member thereof."

Among the speakers in support of the Bill were Mr. Fawcett, Mr. Lowe, and Mr. Gladstone. The Bill was opposed by Mr. W. Heathcote, Mr. Henley, and Mr. Selywn, who pointed out that no provision was contained in it for the maintenance of the necessary discipline over the out-students; and that, as the best mode of extending the benefits of University Education was now being considered by the most active minds of both Universities, it would be unfair, before they had worked it out to press a compulsory measure upon them. Mr. Lowe asked the House to read the Bill a second time, as there was little chance of the Universities doing anything of themselves, for they had had this subject before them now for two years. He grounded his support of the Bill chiefly on a contrast of the magnificent endowments of the Universities and the ridiculously small number of persons who were admitted to compete for them, and on the necessity of doing something to open the Universities to a poorer class of scholars. Mr. Gladstone, replying to the argument that the discipline of the out-students had not been provided for, pointed out that this was left, as it ought to be, entirely to the University authorities. He supported the Bill as a step in advance, supplementary to, and rendered necessary by the failure of the system of private halls and licensed houses, and the recognized insufficiency of the college system. He dwelt with great force on the necessity of extending the influence of the Universities, on the trifling hold they now maintained on the legal and medical professions and the manufacturing and commercial community, and on their falling hold even of the Church, and predicted that, if some moderate attempt were not made to increase the value of the endowed teaching staff of the Universities, a more sweeping innovation would be proposed under the more earnest regime which was approaching.

Although the debate altogether added but little to the arguments pro and con which have often been previously advanced, it summed them up with some succinctness, and has thus helped forward the public comprehension of a very important question. The appointment of a Committee to inquire cannot fail to do much good, and every one engaged in education will await with interest the publication of its Report, and the evidence it has collected, on the working of a system which even its best friends cannot wholly approve.—*Educational Times*.

SCIENTIFIC INTELLIGENCE.

—A life-time might be spent in investigating the mysteries hidden in a bee-hive, and still half of the secrets would be undiscovered. The formation of the cell has long been a celebrated problem for the mathematician, whilst the changes which the honey undergoes offer at least an equal interest to the chemist. Every one knows what honey, fresh from the comb, is like. It is a clear, yellow syrup, without a trace of solid sugar in it. Upon straining, however, it gradually assumes a crystalline appearance, it candies, as the saying is, and ultimately becomes a solid lump of sugar. It has not been suspected that this change was due to a photographic action; that the same agent which alters the molecular arrangement of the iodide of silver on the excited collodion plate, and determines the formation of camphor and iodine crystals in a bottle, causes the syrup honey to assume a crystalline form. This, however, is the case. M. Scheibler has enclosed honey in stoppered flasks, some of which he has kept in perfect darkness, whilst others have been exposed to the light. The invariable results have been that the sunned portion rapidly crystallizes, whilst that kept in the dark has remained perfectly liquid. We now see why bees are so careful to work in perfect darkness, and why they are so careful to obscure the glass windows which are sometimes placed in their hives. The existence of their young depends on the liquidity of the saccharine food present to them, and if light were allowed access to this, the syrup would gradually acquire a more or less solid consistency; it would seal up the cells, and, in all probability, prove fatal to the inmates of the hive.—*Chronicle of Optics, in the Quarterly Journal of Science*.

—A French journal says that the soundings for the new trans-Atlantic cable have enabled comparisons to be made of the depths of the different seas. Generally speaking, they are not of any great depth in the neighborhood of continents. Thus, the Baltic, between Germany and Sweden, is only 120 feet deep; and the Adriatic, between Venice and Trieste, 130 feet. The greatest depth of the channel between France and England does not exceed 300 feet, while to the southwest of Ireland, where the sea is open, the depth is more than 2,000 feet. The seas to the south of Europe are much deeper than those in the interior. In the narrowest part of the Straits of Gibraltar the depth is only 1,000 feet, while a little more to the east it is 3,000 feet. On the coast of Spain the depth is nearly 6,000 feet. At 250 miles south of Nantucket (South of Cape Cod), no bottom was found at 7,000 feet. The greatest depths of all are to be met with in the Southern Ocean. To the west of the Cape of Good Hope, 16,000 feet have been measured, and to the west of St. Helena, 27,000. Dr. Young estimates the average depth of the Atlantic at 25,000 feet, and of the Pacific at 20,000.—*Annual of Scientific Discovery*.

Beating of the Heart.—In ascending into the air, the heart-beats increase 7 for the first 3,000 feet, 7 for the next 1,500 feet, 8 for the next 1,500, and 7 for each 1,500 feet of ascent after that. This is an average increase of one beat for each 100 yards of ascent.—*ib.*

—M. Du.ossé summed up a memoir on this subject before the French Academy with these general conclusions: "Anatomy, physiology, and the history of the manners of animals all agree in demonstrating that nature has been far from refusing to all fishes the gift of expressing by sounds their instinctive sensations, but she has not accorded to these beings that unity of mechanism in the formation of sonorous vibrations which she has done in the first three classes of the vertebrates. There are in the organization of fishes at least three essentially distinct mechanisms, of gradually diminishing physiological value. Many species have the power of emitting commensurable sounds, musical, and engendered by a mechanism of which muscular vibration is the principal motive-power; others can give birth to breathing sounds like those which many reptiles emit, and finally others have only the power of making stridulous noises, the effect of a coarse mechanism, such as is found in a great number of insects. It would be a misconception of the physiological definition of the word voice, to use that word for the purpose of designating sounds so very different one from another, and especially the commensurable sounds which fishes produce by means of three organic mechanisms which have no resemblance to each other."—*ib.*

—The small people of Equatorial Africa, recently discovered by Du Chaillu, about 1° and 2° south latitude and 12° east longitude, are described as of migratory habits, and as changing their temporary shelter under trees from one place to another. While the inhabitants of this mountain region are lighter in color than those of the sea-shore, these Obongo are still less dark. They have only short tufts of hair upon their heads, and are thus strikingly distinguished from the settled inhabitants, who wear large turrets of hair upon their heads. "The following are the measurements I was enabled to make: The only adult male measured four feet and six inches, but as one of the women reached five feet and one quarter of an inch she being extraordinarily tall, I have no doubt some of the men are equally tall, and some perhaps taller. The other women I measured had the following height; four feet one inch, four feet seven and a quarter inches, four feet five inches, and the smallest, four feet and a quarter of an inch."—*ib.*