



THE
JOURNAL OF EDUCATION

Devoted to Education, Literature, Science, and the Arts.

Volume XVIII.

Quebec, Province of Quebec, May, 1874.

No. 5.

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School Management and Methods of Teaching.

(By DR. JOYCE.)

(Continued.)

SYSTEMS OF ORGANIZATION.

I. *Perpetual Employment.*

Visit any national school, the teacher of which has not adopted a proper system of organization, and with great probability you will observe the business carried on in something like the following manner:—One or two classes are standing up, receiving instructions from the master and a monitor; all the rest of the pupils are sitting, either in desks or on forms round the walls of the room, some few of the more advanced writing or working from their arithmetics, a few others preparing lessons with apparent attention, but the great majority, especially of the young children, openly idle.

You will find that this is the manner of transacting business during the entire day; that no more than two or three classes are actively and profitably engaged together at any one time; and that, consequently,

although the teacher may be uninterruptedly employed teaching class after class, a large proportion of the school day is absolutely lost to the majority of the pupils. Is it necessary that these children should sit so long idle? Could we not contrive some plan by which all might be profitably employed the whole day, with only half an hour's intermission for play? This has been accomplished, and is perfectly possible in every school.

Let us then begin by laying down this important maxim, which may be called "The principle of perpetual employment":—"Every child in the school should be engaged at some useful employment, at every moment during the entire day". From this is to be excluded "preparing lessons;" in the first place, all lessons should be prepared at home, and in the second place, every practical teacher knows that preparing lessons in school is generally only another name for idleness. To solve the problem of perpetual employment is one of the objects of every system of organization. I shall proceed at once to describe the systems that are most generally useful, and best adapted to the circumstances of our national schools. The arrangement of furniture in a room depends upon the manner in which the school is to be organized; I shall, therefore, in connection with each system, describe the particular arrangements suited to it.

BIPARTITE OR TWO-PART SYSTEM.

2. *Description; Division of Pupils.*

When the whole of the pupils are divided into two parts, one division being engaged at some desk lesson (as writing &c.), while the pupils of the other division stand round the room in drafts at an oral lesson (such as arithmetic, reading, &c.), and when the two divisions change places and subjects at the end of each lesson during the entire day; this is what is called the bipartite or two-part system of organization. This system is very suitable for the generality of national schools; and it will be necessary, therefore, to enter somewhat into detail regarding the manner of carrying it out.

By the word "class," is meant all the children who read the same class-book; all those, for instance, who read out of third book, form the third class. By "draft," is meant all the pupils who stand together at the same

circle to read the same lesson ; there may be several drafts in the same class. Ten or twelve pupils will be quite a sufficient number for each draft, (taking the word in the sense now explained), and some drafts might be much smaller, especially among the junior children, and in small schools, where it is often difficult to find even a dozen children so nearly equal in proficiency as to be fit to read the same lesson and work the same arithmetic.

The chief reason for limiting the drafts to this number is, that at the reading lesson each individual pupil may have sufficient time for reading ; if the draft be very large, it will be impossible to accomplish this ; and at the same time to explain and examine on the subject matter, within the time usually allowed for a reading lesson. By limiting the number to ten or twelve, however, it is not meant that the drafts are to be always kept apart. It is generally necessary to separate them at reading, and at some other lessons of a like nature ; but there are certain subjects, such as geography, grammar, certain portions of arithmetic, etc., in which two or more drafts might be joined. Directions will be given in the proper place when to keep the drafts apart, and when to combine them into larger sections.

The two great divisions of the pupils must be nearly equal in numbers. No fixed rule can be laid down as to the particular drafts that compose each, as this depends entirely on the school. In some schools the children of the first and second classes are equal in number to those of the third and fourth ; in others again, those of the first class alone are as numerous as all the rest of the pupils taken together. It more commonly happens, however, that the first and second classes constitute more, and the first alone less than half the entire school. In this case the second class must be divided, part going to the senior and the remainder to the junior division. I will suppose a case : let there be 69 pupils in daily attendance, who are partitioned in the following way ; fourth class, 7 ; third, 12, second, 25, in three drafts ; and first 25, in three drafts. In this school the following would be the proper division.

Jun. Div	3rd drft. of 1st.	2nd of 1st.	1st of 1st.	3rd of 2nd.	Total.
	8	9	8	8	33
Sen. Div.....	2nd drft. of 2nd.	1st of 2nd	Third.	Fourth.	
	8	9	12	7	36

There are many schools, especially in rural localities, in which the relative numbers in the different classes are subject to much variation according to the season. In the winter months the grown up pupils attend, while the young children are kept at home by the severity of the weather ; in summer it is the reverse, the little ones attend, and the elder ones are generally employed at home. The partition made in summer, therefore, may not answer in winter, and the teacher will be careful to restore the equality of the two divisions, by transferring, at the proper time, a draft from one to the other ; reminding the children at the same time, that this transfer of a draft is neither promotion on the one hand, nor depression on the other ; that the draft in question will be taught the same lessons as before, only at different hours. Such a change as this should not be frequently made—if possible not oftener than twice a year—as it always acts more or less injuriously on the discipline of the school.

3. Draft Spaces and Circles.

The space for draft teaching should be along one or more of the walls ; this is far the most convenient place, for on the walls can be suspended the chief teaching appliances, such as maps, tablets, black boards, etc. Besides, a class standing next a wall is to some extent isolated from the rest of the school. Any considerable space in the middle of a floor, with desks or other furniture placed between it and the walls on each side, may be regarded as of comparatively little value for teaching purposes.

The particular side wall to be left open for drafts depends upon the circumstances of the school ; it is often, for instance, determined by the position of the door ; but, generally speaking, that one should be chosen which is best illuminated, and least interrupted by windows and fire-places. The space should be so broad, that when the pupils are standing at the circles, there will be room for a person to pass freely between their backs and the desks without touching either. If the ends of the desks be seven feet from the wall, it will be amply sufficient to allow this. In most small schools, 6 or 6½ feet will be quite enough ; and if economy of space be a special object, it may be reduced to five, but this will not allow a person to pass behind the children, as their backs will in fact be resting against the desks.

It may be stated generally, that the width of the draft space ought to be in some degree proportioned to the width of the room ; thus, if the room be 14 or 16 feet wide, the draft space may be 6 feet ; for a room 18 feet wide, draft space 7 feet ; 8 feet for a room of 20 feet, and so on. In very large schools it might be left much broader ; in the principal central Model School, Dublin, there is a space of 11 feet along each side wall.

There must be as many draft circles as will accommodate one division—that is half the pupils at once. The number, therefore, will vary with the attendance ; but to provide for contingencies, there should be, if possible, one more than the number absolutely necessary. While, on the one hand, there must be a sufficiency of desks, on the other hand, as much as possible of the walls should be left free for draft teaching. In small schools it is usually sufficient to leave a space along one side wall and one end. In a large room three walls may be necessary ; and if the room and the attendance be both very large, there may be circles all round, the desks being placed in the middle. (1).

The circles ought to be placed as far apart as the draft space will allow, as this tends greatly to lessen noise ; but the distance between two adjacent circles should never be less than two feet. To determine the best places for them is often a matter requiring some thought. In case of doubt or difficulty, it will be better to mark them with chalk for a few days, when they can be altered if necessary ; when the best positions have been found, they can be marked permanently. For the purpose of teaching large classes together, there ought to be two or more large circles pitched among the smaller ones. Each of these should have a radius of five or six feet.

The best kind of compass for describing the circle is a piece of cord ; let one end be fastened by a nail in the circle, and the other formed into a loop ; the circle can then be marked with a nail or any other pointed instrument. Various materials are employed for marking them permanently. Some use strips of brass ; others brass nails with flat heads, driven closely all round, the heads being sunk into the boards. This plan on the whole appears to answer better than any other.

If brass nails or strips be thought too expensive, common

(1) We regret very much being unable to give the diagrams illustrating how the circles should be made. (Ed., J. E.)

black paint will answer very well : painted circles are quite clearly defined, last for a long time, and are very easily renewed. Any teacher or monitor can make such circles as these without difficulty ; the whole may be done in a couple of hours, and the cost will not exceed a few pence.

(To be continued.)

Hints on the Etiquette of Teaching.

(By B. HEALY.)

(Continued.)

ANTAGONISM.

I.

Faults should be promptly corrected, and then, as far as possible forgotten. Nothing so effectually lowers a teacher in the estimation of his pupils as his remembering with bitterness their misconduct after it has been accounted for.

Private pique may be gratified in a hundred ways, under colour of discharging so many duties ; but, where the disposition to act thus is manifested, true respect and authority cannot exist.

The vice of spite takes many forms. The boast of "being up to them" (the pupils), and the miserable pride that desires to be considered "a match for them," are amongst the number. It is allowable, perhaps, to use these terms here, since they serve to denote the class of young persons who think it necessary to employ them. Teachers of this type sometimes lay claim to the power of telling beforehand what a boy intends, or of foreknowing what he is thinking of, as they phrase it. "They fancy they can read characters at a glance." The subjoined remarks, by a distinguished author, bear directly on this error, and may do a good deal to correct it :—

"We are," he says, "too apt to believe that the character of a boy is easily read." 'Tis a mystery the most profound. Mark what blunders parents constantly make as to the nature of their own offspring—bred, too under their own eyes, and displaying every hour their characteristics. How often, in the nursery, does the genius count for a dunce, because he is pensive, while, a rattling urchin is invested with almost supernatural qualities, because his animal spirits make him imprudent and flippant ! The schoolboy, above all others, is not the simple being the world imagines. In that young bosom are often stirring passions as strong as our own, desires not less violent, a volition not less supreme. In that young bosom what burning love, what intense ambition, what avarice, what lust of power !—envy that friends might emulate—hate that man might fear."—DISRAELI, *Coningsby*.

A teacher deserves no merit for being a match for his pupils. Every one presumes that he is much more than a match—that he is their superior, otherwise he would not be entrusted with their instruction. The habit of styling himself their match may lead people to suppose that he is as well acquainted with mean and paltry tricks as is the most neglected of his pupils ; or that, having despaired of being able to elevate them to his own standing, he has descended to their level : it may even stimulate some of the boys to a trial of strength ; but, whether this happens or not, it must lessen—to speak mere correctly, destroy—their esteem for him. He that lays himself out to be "up to" his pupils shows that he mistakes altogether for what he was sent amongst them.

"Good breeding and good nature incline us rather to help and raise people up to ourselves than to mortify and depress them ; and, in truth, our own private interest

concur in it, as it is making ourselves so many friends, instead of so many enemies.

"The duties of social life every man is obliged to discharge, but these attentions are voluntary acts, the free-will offering of good breeding and good nature ; they are received, remembered, and returned as such."

No doubt, there are children who make it their business to harass and obstruct the teacher—children who treat him as an antagonist, and rejoice in his discomfiture ; adepts in all nasty practices, who display much smartness in their manœuvres, and who apparently would require to be conquered anew every day of their lives.

When a young teacher, entering upon the duties of his office, finds a class, or, still worse, a whole school composed of children of this stamp, it often happens that, after months of labour, he becomes chagrined and discouraged, and feels inclined to regard any future attempt to improve them as mere folly, and every further endeavour to conciliate them as meanness on his part.

He has now arrived at the most critical stage of his career. There is danger that these, or like thoughts, gaining an ascendancy in his mind, or sentiments of even a darker shade taking possession of his heart, may induce him to assume a bitter or repellant manner in his aftercourse with the pupils. But where he encounters no unusual opposition from the children it is not to be forgotten that he may experience a check of some other kind. For, even when he and his pupils perfectly agree, it not unfrequently happens that a sense of weariness or disappointment settles upon him, bringing along with it a disrelish for all his duties.

Something of this nature forces itself on every young teacher sooner or later, and, at that time, demands much strength of character in himself, and some encouragement and judicious advice from those who direct him, to bring him safely through the difficulties of the situation. It frequently happens that it is at such a season of reaction the young teacher determines how he shall treat his pupils for the future, and whether his conduct towards them shall reflect a high and generous spirit, or, on the contrary, suggest a mean and exacting one.

Every teacher deserving the name must resolve with himself that no circumstances, however untoward, in which he may be placed, shall ever induce him to act as if he believed that the natural relations between pupil and teacher are, or ought to be, antagonistic. When children see that you understand their arts, but consider it beneath you tell them—for the less said, while this matter is in hand, the better—they will begin to think of laying them aside : when they find that you act on principle, and offer passive resistance only—that you have determined not to give their tricks that importance which active opposition would confer—they must at the same time discover that you have taken away from them the power of giving you trouble in future. One of the most popular writers of the present day strongly supports this position when he says :—"Quiet resolution is the one quality the children fail in. If they can once shake this superior quality in their master, they get the better of him. If they can never succeed in disturbing it, he gets the better of them. Remember this plain truth."

While pursuing the course pointed out you may fairly use any blunders committed on their part as opportunities of exposing the folly of their attempts.

II.

Another class of children of tender years, who have been forced into deceit by association or example, look on the teacher, or any one in authority, as opposed to them, but they do not enter upon hostilities. They use their

cunning to defend themselves, not to plague you. They are desirous of avoiding scrutiny, and readily yield a servile acquiescence to your will, if you rest satisfied with this and let them alone.

They pursue a deceitful course, because they believe it serves their interests better than an honest one could. Out of school, circumstances may appear to render (in their opinions at least) such conduct necessary to them. A teacher who turns in disgust from a child so affected without making any effort to reform him (except, perhaps, to have him punished for what is his misfortune more than his fault) deserves severe censure. Prove to such a child, by your acts, that crooked and underhand practices are not the ways to success under your rule—that they cannot accomplish one half as much as open straightforward dealing. Demonstrate this in your conduct towards him, and you must effect good. As the expressions, “prove this” and “demonstrate that,” sound some what vague, the following hints may be more acceptable; they are addressed to particulars.

III.

Do not rail at children; faults are not cured by railing. Every day experience proves this. In nine cases out of ten, a parent, complaining of his child for some fault committed, concludes by saying, “And I am always taking to him about that.” On his own showing, then his words have been thrown away; so would yours were you to follow the same course.

There have been instances of teachers applying offensive epithets to their pupils (calling names as children say); it is a part of the plan of “being a match for them.” All that needs be said is—it is inexcusable.

IV.

Railing leads to threatening; the one is closely related to the other. Threats used by a teacher to his pupils are objectionable. From using them occasionally, a teacher will fall into a habit, and it is then the evils of threatening appear. Children get tired of hearing them over again. They do not know how to act. They cannot tell when the teacher uses the threat merely from habit, as an expedient to obtain their momentary attention, and when he is resolved to execute it. In the end they do not attend to him at all. The policy of not attending to him at all is in the first case—where the threat is used from habit, or to serve the purpose of the moment—a very useful policy indeed; but in other instances it is disastrous, resulting in outbreaks of anger, and unnecessary severity and pain. And where disgraceful exhibitions of temper and their distressing accompaniments take place, it will, upon examination, be found that the greater number of them are brought about by threatening or railing.

These truths strike the intelligent visitor at once, while they take years, and sometimes fail altogether, to make their way into the minds of persons who spend their lives among classes and schools. Like all others, the habit of threatening grows upon the person who gives himself up to it. From threats of trifling punishments, he advances to those of extreme severity. He will “turn this boy out of the class;” he will have that one “expelled from the school;” and so of corporal punishments. This betrays him into untruths, since, from the unreasonableness of his threats, he would not be allowed to put them in force. Besides these, the following remarks may be offered, because with some persons it will possess more weight than any that has been previously urged: A teacher who threatens a certain amount or form of punishment to offences of different kinds cannot escape

having his common threat, or some ill-natured or ludicrous modification of it, fastened upon him as a nickname by his pupils or his companions.

There was, not long ago, a teacher who considered that the proper punishment for every school offence was to detain the offender for an hour after school. He seldom lost an opportunity of telling his pupils this, or of putting it in practice whenever they fell into his hands. His zeal in this particular soon won for him the *soubriquet* of “four o'clock.” Another, who upon the matter of punishments differed widely from the former, held that a corrective for every boyish misdemeanour was to be found in a certain number of slaps on the hands. He too asserted his conviction somewhat noisily; and the children, with ready appreciation of his merits, accorded him the title of “half a-dozen.”

V.

When some ugly trick presents itself for the first time in one of the pupils, you will find that to pass it over at the moment of its occurrence, and to mention it incidentally some time afterwards, without any direct personal reference to the offending party, is a better way to effect its discontinuance than to attack the trick out of hand, and deliver a lecture upon it there and then. The child concerned in it cannot fail to perceive that it is he who gave occasion for the remarks. He will be grateful to you for your forbearance and consideration for his feelings; but, should you assail him personally, the chances are, he makes it a personal matter not to give it up. And whenever you enter upon this part of your business, remember that it is necessary to deal with tricks in a firm, straightforward manner; there must be no hinting.

(To be continued.)

The Aesthetic Education of Children in Common Schools.

(By WILLIAM JOLLY, H. M. Inspector of Schools, Scotland.)

The education of our children in the past has been very partial and contracted. Large sections of their nature have been neglected in our educational system. The intellect alone has received any systematic exercise; but even that has been very one-sided, appealing too much to the merely acquisitive powers and too little to the perceptive and reflective. The moral faculties have not been systematically educated, and the physical have been entirely ignored. The wide range of powers that form or have relation to the aesthetic part of our nature has been quite forgotten. But there are pleasing signs of late, that our ideas of what education is begin to broaden. We are slowly beginning to believe that true education is the systematic culture of the whole of the faculties of our nature, and we begin to train where formerly we despised. Our intellectual education becomes wider, systematic moral training draws attention, and physical exercises are being introduced into our schools. But very little has yet been done towards the training of Taste. Our teachers have scarcely thought of their duty and their privilege in this important and pleasant field, and our schools have very little aesthetic surroundings, and less of systematic aesthetic training.

This neglect has told grievously upon the nation. We are a rude people, and we greatly pride ourselves upon our rudeness. We have mistaken roughness and abruptness for energy and honesty. We have reckoned art as artifice, and, with our great uncultured vigour, we have

despised the sweeter elements of character, that would have adorned our strength. Thus we seem to our more cultivated neighbours to be altogether devoid of taste, and we receive their pity, if not their contempt, and we deserve it. Our best society, as confessed by our greatest writers, is wanting in the culture, sweetness, and grace that are seen in other nations, and the mass of our people are rude, boorish, and still largely savage in speech and behaviour. Our better manners are more the imperfect imitation of those of foreign society, than the spontaneous outcome of inner culture based on thorough æsthetic education. It is time that we should try to redeem our disgrace and recover our loss in this the sweetest part of human nature; and we are making some efforts to do this. Taste begins to grow amongst our people, though it is as yet a puny plant and hardly naturalised: art begins to flourish more vigorously and take deeper root in our colder clime; our manners begin to ameliorate; and our Government recognises it as a national duty to foster art training in our schools.

But our efforts must be more systematic to have any prospect of success, and we must commence them earlier in life. We must begin with our schools. We must set ourselves systematically to train the taste of our children. Our schoolmasters have a most important national function to perform, if they waken to their responsibilities and power in this respect. There is no class in the community that could achieve what our teachers could achieve, towards training the national taste and elevating the æsthetic culture of the next generation, if they were to set themselves to the great and delightful task. For it is with the tender and susceptible minds of the young, who are to become our future citizens, that we must deal in this work of delicacy and sweetness, if we are to inspire our people with æsthetic life. It is here that our mission lies—our common schools must be schools of æsthetic culture. There is no doubt that, by means of our schools æsthetically adorned, our schoolmasters æsthetically educated, and our children æsthetically trained, a national reformation in taste could be achieved. If this is to be done at all, it can only be effectively done by means of our scholastic machinery. The national heart of our future æsthetic culture beats in our schoolrooms; and we must vitalise its action, and enrich and purify the blood that flows thence, if we wish to strengthen and purify the national life. It is because I have a thorough conviction that our best and most effective field of culture and refinement lies in our schools, that I would seek to direct the attention of the profession to their great possibilities in this important and neglected field.

But this matter of æsthetic training has a more direct bearing on our schools and schoolmasters. It is a great element in their happiness. In no element of school life is there such variety as in this of æsthetic influence. In some schools, there is a sweet attractiveness, a delightful air, in which it is pleasant to move and work—an air as palpable as the air of heaven, but, at all times, as full of brightness and life as a sunny day in summer. In other schools, there exists an unhappy atmosphere, and a cold, depressing, irritating, hardening influence pervades the room and all that is done in it, as if a chill east wind were blowing through the heart. And there are all grades of difference between schools in this respect, from the brightest and sweetest, to the dreariest and worst. The greatest cause of this difference in school tone and atmosphere is a moral one; but one undoubted cause is the presence or absence of æsthetic influences.

It is to some of the means of æsthetic training that I would now seek to direct the attention of teachers. It is because I have felt the delight or the depression of their presence or absence, that I would wish every school to

be pervaded by something of their light and sweetness; and it is the conviction daily forced upon me in moving about amongst schools, that every one of them might have more of this happy air pervading them, that has induced me to advocate the subject. The work of schoolmaster is, beyond doubt, one of the most trying and most laborious in the world. It should, therefore, be surrounded and pervaded, as much as it can be, with higher and brighter vitalising elements, that will lighten its drudgery and illuminate its toil. I am convinced, from what I have seen achieved in this way, and from more that could be achieved, that every schoolroom in the country might be made as pleasant as our homes, and thus become a centre of attraction to our children, and a bright memory to them in after years. It is the duty of all interested in education to do something towards making our less fortunate schools as sweet as the best, and all our schools sweeter, brighter, and happier than they are; and I now seek to make some contribution towards this end, so devoutly to be wished.

In what I shall say on the subject, I shall try to be as practical as possible. It is not a matter of mere sentiment and fine talking, but of practical effort, of work to be done. I shall enter into more or less detail—detail that may be reckoned by some finical and excessive; but I would remind all such that, in this subject of training in taste, detail is everything, and that, without severest attention to the smallest details, true and correct taste cannot exist, any more than there can be perfect cleanliness without minute attention to every part of the body. I am certain to give expression to many things regarding which there will be differences of opinion; but this is as it should be. I wish merely to rouse thought on this neglected part of education, and I desire every man to take his own best way to the same good end—the training of our children systematically and successfully to a love and practice of the beautiful that will be second only to the love and practice of the good and the true.

Æsthetic Education is both Passive and Active. The Passive or Insensible education of Taste is received unconsciously from the surroundings of the children, the persons and things amidst which they move. The Active education of taste is given by the teacher, through special instruction and training specifically designed for this end. Of these two kinds of æsthetic education I proceed to speak

I.—THE PASSIVE OR INSENSIBLE EDUCATION OF TASTE.

This Passive education will be received chiefly in three ways:—(1) From the schoolroom itself; (2) from the persons that form the school; and (3) from the teaching.

I.—*The Insensible Influence of the Schoolroom on Taste.*

(1) *The School Premises.* These should breathe as much as possible of æsthetic influence. The situation of the school should be open and cheerful, and should command, as far as possible, a pleasant, if not wide and beautiful, prospect. It certainly should always do this in the country. The school buildings should have, in every case, some architectural merit. I hope our new buildings in Scotland will help to redeem the reproach of the past in this respect. The playground should be ample, and well drained and gravelled, with no unseemly irregularities or pools on its surface. It should be enclosed with a neat wall and railing, and a more or less ornamental gate. There should be a garden round to the school walls, at least, bright with the presence of many flowers, kept with loving care by the teacher and the children, and exhibiting some of the finer effects of artistic gardening. Trees and plants should be trained up the walls, which should be radiant with the hues of the rose, and the honeysuckle, and their companions. Standard trees would surround the playground with fine effect; and

one would like to see—what is sometimes seen at our village schools—some of our greater forest trees, as the tall elm and the oak, throwing their grand, umbrageous protection over every schoolroom. The offices should be, as far as possible, hidden from view, in a retired part of the ground, and not obtruded on the eye, as they too often are; and they might be still more shaded from sight by well disposed shrubbery.

Every school should have a commodious entrance-room—for it should be a room, and not a miserable little lobby, as it so often is even where it exists. This room should contain sufficient space for the hat and cloak of every child, who should have his own peg, properly numbered. Each class should have its own portion of the wall. These pegs, should be so placed as not to interfere with each other, and should not be above each other, as that prevents cloaks and other articles being properly hung. None of these things should be carried into the schoolroom. There should also be provided a mat to wipe the feet, a grating for snow and mud, a scraper for dirty roads, and a stand for umbrellas. Without these, no schoolroom can be kept clean, tidy, and healthy. There should also be, in connection with this entrance-room, but in a separate department off it, lavatories and drinking-places, with all requirements, according to the number of children in attendance. These lavatories are important parts of school accommodation, and necessary auxiliaries in preaching "the gospel of soap"—a primary element in the training of taste.—*The Schoolmaster.*

Annual Convocation of McGill University.

FACULTY OF ARTS.

The annual public meeting of Convocation for the conferring of Degrees in Arts, was held on the 30th ult., in the William Molson Hall.

The Hon. Mr. Justice DUNKIN presided. There were also present of the Governing Body, Professors and Graduates:—Messrs. A. Robertson, Q. C.; Vice-Chancellor Dawson; F. R. S.; Ven Archdeacon Leach, Vice-Principal; Prof. G. W. Campbell, M. D.; Prof. Cornish, LL. D.; R. A. Ramsay, M. A., B. C. L.; John Reddy, M. D.; G. A. Baynes, M. D.; C. P. Davidson, M. A., B. C. L.; E. Holton, B. C. L.; W. C. Baynes, B. A.; E. A. Baynes, B. C. L.; Prof. Scott, M. D.; Prof. Markgraf, M. A.; Prof. Darey, M. A., B. C. L.; Prof. Craik, M. D.; J. S. C. Wurtele, B. C. L.; Rev. J. C. Murray, LL. D.; B. L. Harrington, Ph. D.; E. Lareau, LL. B., Rev. C. Bancroft, LL. D.; James Kirby, D. C. L., LL. D.; J. S. Proudfoot, M. D.; Rev. C. Chapman, M. A.; L. Cushing, M. A., B. C. L.; James Cameron, B. A.; E. F. Torrance, B. A.;

The Ven ARCHDEACON LEACH, Vice-Principal, and Dean of the Faculty of Arts, having opened the proceedings with prayer, made the following announcement of Degrees in Arts, and award of prizes and honours to students:—

FACULTY OF ARTS.

Passed for the Degree of B. A.—In Honors—(alphabetically arranged)—John Allan, Wm. B. Dawson, Finlay McN. Dewey, Kutusoff N. McFee, John S. McLennan, Archibald D. Taylor, Henry W. Thomas, George B. Ward. Ordinary—Class I, Charles J. Harvey; Class II, Alfred Harvey, Samuel Greenshields; Class III, John S. Hall, James R. Black, John Empson, James Craig, Samuel C. Stevenson. Passed in the intermediate Examination—Class I, Hugh Pedley, Archibald McGoun and Henry H. Lyman, equal; Alindus J. Watson; Class II, Robert J. Crothers, Jacob W. Cox and Alfred C. Morton, equal; Class III, Thomas Duffy, John Graham, Guy C. Phinney, John L. McOuat, Wm. H. Gray, John Matheson.

Bachelors of Arts Proceeding to the Degree of M. A.—

Jas. Cameron, B. A.; John D. Clowe, B. A.; Wm. J. Dart B. A.; Duncan McGregor, B. A.; Gustavus Munro, B. A.; Edward F. Torrance, B. A.

Master of Arts Proceeding to the Degree of L. L. D.—James Kirby, M. A.

Passed for the Degree of Bachelor of Applied Science—Course of Civil and Mechanical Engineering—(In order of relative standing)—Chas. J. Harvey; Alexander J. McLean; St. George J. Boswell; George S. Robertson. Course of Mining and Assaying—(In order of relative standing)—Joseph William Spencer; Henry K. Wicksteed.

HONORS AND PRIZES.

Graduating Class.—B. A. Honors in Classics—George B. Ward, first rank honors and Chapman gold medal; Archibald D. Taylor, first rank honors. B. A. Honors in Natural Science.—William B. Dawson, first rank honors and Logan gold medal; John Allan, first rank honors and special Logan prize. B. A. Honors in Mental and Moral Philosophy.—Kutusoff N. McFee, first rank honors and Prince of Wales gold medal; John O. McLennan, first rank honors; Finlay McN. Dewey, second rank honors. B. A. Honors in English Literature—Henry W. Thomas, first rank honors and Shakespeare gold medal.

Third Year.—G. S. Stewart, first rank honors in mental and moral philosophy; George H. Chandler, first rank general standing, prize in moral philosophy, prize for collection of plants; Wm. M. McKibbin; prize in zoology; Henry K. Wicksteed, prize in German. Passed the sessional examinations: Chandler, Stewart, McKibbin, Ritchie, Wicksteed.

Second Year.—Hugh Pedley (Victoria College,) first rank general standing, prize in botany; H. Lyman (High School,) first rank general standing, prize in logic, prize in botany; Archibald McGoun, first rank general standing; Alindus J. Watson, first rank general standing; H. C. Morton, prize in English literature. Passed the sessional examinations: Pedley, McGoun, and Lyman, equal; Watson, Crothers, Cox and Morton, equal; Duffy, Graham, Phinney, McOuat, Gray.

First Year.—Eugène Lafleur (High School, Montreal,) first rank honors in mathematics and prize, first rank general standing, first prize in classics, prize in history, prize in French, prize in German, prize for English essay; J. H. Graham (Huntingdon Academy), second rank honors in mathematics; Charles H. Gould (High School, Montreal,) first rank general standing, second prize in classics, prize in French. William H. Warner, First Rank General Standing; prize in Hebrew; prize in Chemistry; prize in English, and prize for Essay; Sydney C. Chubb (Southampton College), prize in Chemistry. Passed the Sessional Examinations: Lafleur, Gould, Warriner, Scott, Robertson, Graham, Atwater, Russell, Anderson, McGibbon, McGregor, Chubb, Walker.

DEPARTMENT OF PRACTICAL AND APPLIED SCIENCE.

Second Year.—Joseph William Spencer, First Rank Honors in Geology and Mineralogy; Charles J. Harvey, prize in French.

Middle Year.—Arthur E. Hill, prize in Engineering. Passed the Sessional Examinations: Hill, Burchell, Hawley, Ross, Page, Wilson, Rodger.

Junior Year.—Frederick Hetherington (High School, Quebec), prize in Engineering. Passed the Sessional Examinations: Thomas, Ewing, Hetherington, Reed, Rogers.

The degree of B. A. having been conferred on those mentioned above as having passed, and the medals having been presented to the successful candidates, a valedictory address was read by Mr. John S. McLennan, B. A., on behalf of the graduates in Arts. The Degree of Bachelor of Applied Science was then conferred on the

gentlemen above named, and a valedictory on behalf of that department was delivered by Mr. Charles J. Harvey.

Rev. Prof. MURRAY then addressed the graduates upon the subject of education and mental culture. The Rev. gentleman discussed at some length the respective merits of the classical and science systems of mental training, and offered some valuable suggestions to the graduating classes.

The Degree of M. A. in Course was then conferred by the Vice-Chancellor upon Messrs. James Cameron, John D. Clowe, William J. Dart, Duncan McGregor, Gustavus Munro, E. F. Torrance, Bachelors of Arts.

The Degree of LL. D., in course was conferred upon Mr. James Kirby, M. A., D. C. L.

The Degree of B. C. L., *ad eundem*, was conferred upon Mr. Lareau, LL. B., Victoria College.

The Chairman then addressed the convocation. He remarked that at the recent meeting of the Law and Medical Faculties, he had offered some observations upon the duty of liberality towards the University incumbent upon private individuals. He took the present opportunity to represent the need of more students. This year they had the largest graduating class in arts yet attained, but the number was only sixteen, which he thought was much below the number who, in a city of this population, and in a country like Canada, should present themselves. Every young man in this country had the opportunity of rising to the highest positions, and to enable them to make a fair start parents should afford their sons the benefit of the culture which was within their reach at this University. The learned Judge then referred to the profession of husbandry as one of vast importance. A great many people thought no preparation was required for this calling. Without claiming for agriculture an excessive share of importance, it must be remarked that it was the aggregate of the harvest of the seas, the mines, the forests, the through trade, and the improvable lands that made up the earnings of the community. There was a foolish idea prevalent that it didn't require much capital or brains for a farmer—that anybody could do work like that; but this was a great mistake. People who had money must educate their children for the pursuit of this industry before the resources of the country could be fully developed. One reason, he thought, why so many sons and grandsons of rich men descended in the social scale was because their parents brought them up to the same profession as they had themselves succeeded in. But children often had a distaste for their fathers' pursuits, or thought they had money enough without working. They might call themselves gentlemen, but gentlemen without education, gentlemen in a country like this, without some work to do, would not be gentlemen long. He condemned the crowding of large numbers into the learned professions, a proceeding which, to use a very homely expression, resulted in there being more cats than there were mice to catch. (Applause.) In conclusion, he reminded the graduates of McGill of the debt they owed their University, and hoped they would strive to discharge it to the best of their ability.

The Vice-Chancellor stated that, though he did not propose to address Convocation, he had a few statements and announcements to make. The first gold medal ever offered in this University was that founded by Henry Chapman, in 1856, and copies of which he has had annually struck from the beautiful dies executed for him by Leonard Wyon, of London. Mr. Chapman now proposes to render this gift permanent by placing the dies and a sum of money for the endowment of the medal in the hands of the Board of Governors; so that this the first gold medal of McGill College will be placed in point of perpetuity on a par with the others, and will continue to

be offered as a stimulus to the higher culture of the classical languages and literature. He had to announce with much gratification, another and most valuable gift to the College from His Excellency the Governor General, who proposes to give annually, during his residence in Canada, a gold, and a silver medal for competition in the Faculty of Arts. After careful consideration the Corporation has decided to suggest to His Excellency as the special subject for these medals a course of study in History, and that the competition should be open not only to undergraduates, but to graduates within seven years of their matriculation. Should this suggestion be adopted, the Vice-Chancellor proceeded to say, the subjects appointed for study will be announced in the Calendar now forthcoming, and the first examination for the Earl of Dufferin's medals will be held in December next. There can be no doubt that these medals will rank among the most coveted distinctions that the University can offer, and it is to be hoped that there will be many competitors, and that not only will a stimulus be given to historical research, and the admirable collection of historical books placed in our Library by Mr. Peter Redpath be more fully utilized, but that the interest excited may move some of our citizens to endow a chair of History in the University. In the past session the students of the University have numbered over 300, of whom the large proportion of 118 are in the Faculty of Arts. The Degrees in course conferred at this meeting of convocation and that held in March are 77. There is reason to hope that we shall have still larger classes next year. In connection with this I would direct attention to some changes in the Calendar for next session, the earlier sheets of which are now on the table for distribution. One of these relates to the Scholarships offered in the third year and to the Scott exhibitions, the conditions of which have been so modified as to make them accessible to a larger number of competitors. Another relates to exemptions offered in the third year in favor of honour studies. Another is the appointment of an assistant to the Professor of Engineering and the institution of arrangements for field-work at an earlier period of the session than heretofore. All of these and some other changes introduced will, it is hoped, be found conducive to the advantage of our students.

The Most Rev. the Metropolitan having pronounced the Benediction, the proceedings came to a close.

At a meeting held yesterday afternoon the following representative fellows were elected:—Law, J. J. Maclaren, M. A., B. C. L.; E. Holton, B. C. L.; Medicine, J. Reddy, M. D.; G. A. Baynes, M. D.; Arts, R. A. Ramsay, M. A., B. C. L.; C. P. Davidson, M. A., B. C. L.

Convocation Season.

The first blush of spring is a fitting season for our University to send forth its noble company of *débutants* on life's stage, each perhaps animated by hopes and desires peculiar to himself, but all alike sustained and nerved for the contest by the fervor of glorious youth. They leave their academic halls with eloquent words of counsel and admonition yet sounding in their ears, and while they revere and strive to follow the advice of their late instructors, they can hardly feel themselves left without a rudder in the stream of life. Year by year addresses of marked ability are delivered at these University gatherings, and though the unusual pressure upon our space has prevented us from doing more than hint at the subject of them on the last occasion, there has been no falling off in the care and talent which they indicate, or the

interest with which they have been received. We are not surprised at this, for the theme is of supreme importance, and even those who have passed the first stages during which such advice is most useful, must give their attention while the way which is thought best is pointed out to those who are pressing in their footsteps. The first statesmen of the day have not disdained the theme. Mr. Disraeli at Glasgow and Lord Derby at Liverpool have given to British youth their matured thoughts upon it; and hardly any one is so low as to think he cannot add a little to the common fund of knowledge. Notwithstanding the multitude of counsellors, however, it is possible that we have not found out much that was not known at some time to our ancestors, though the precepts may have been forgotten or unnoticed. We cannot dispute the noble examples of individual culture which abounded even in the remotest times, but one thing we may claim, that a greater number of persons are in our time afforded the opportunity of drinking at the divine fountain of knowledge. We are not disposed to value this privilege lightly, for the success of educational work must be judged not by isolated examples of high culture, but by the diffusion of knowledge among the multitude. Let the lives of the masses be lifted above the slow, unreasoning existence of undeveloped intelligence, and a great step has been taken beyond what ancient times can show us.

Those of us who listen to or read addresses upon university education and mental culture, may imagine that there is considerable diversity of opinion among those engaged in the work. It is true that there are differences of opinion, and it would be a great mistake to suppose that we have yet discovered an absolutely perfect system of education. But educationists are at least pretty well agreed in the rejection of certain injudicious systems which had their days. There is no longer any hesitation for instance, in disapproving the exclusively classical curriculum. Nor are there many intelligent admirers at the present day of that devotion to the midnight oil which took not into account the physical well being of the student. It may be hoped that amidst all the impressive warnings respecting the importance of physical health, warnings which were recently reiterated by Lord Derby, there will be fewer victims to the *regime* lamented by Horace Mann, who said that in college he was taught all about the motions of the planets as carefully as though they would have been in danger of getting off the track if he had not known their orbits; but about his own organization, and the conditions indispensable to the healthy functions of his own body he was left in profound ignorance. There have been pedagogues who considered all time wasted when the printed page was not before their pupils' eyes, but we trust their day is past, and while the subjects of study are more numerous than our fathers ever dreamed of, it will not be forgotten that it is essential to success in life that the mind should have a suitable temple in which to reign, and that mere book lore without bodily energy is of little profit to its possessor.

One thing which is apt to bewilder the student of the present day is the great variety of the subjects which by his various instructors are pressed upon his attention as of equal importance, and each of which seems to him to demand a lifetime for its mastery. It is undoubtedly becoming more and more important for those who aim to excel in any pursuit to fix early their choice; after they have done so firmly and irrevocably, there is not much danger of their extending their studies too far. But if the student wanders listlessly, undecided and hesitating as to his future, there is danger that the keen memory and intellectual freshness of youth

may grow dull before the time arrives when the actual preparation for life's work is entered upon. "Le mieux est l'ennemi du bien," says the French proverb. By seeking uneasily and anxiously after what shall approve itself to his judgment as absolutely the best work for him, the student will often be put to serious disadvantage in the battle of life. "The man who succeeds above his fellows," said the late Lord Lytton, "is the one who early in life clearly discerns his object, and towards that object habitually directs his powers."

At the same time we are far from urging our young friends to make preeminence in some particular pursuit the engrossing care of their life. Some one has lamented that so many excellent men in the United States have been spoiled by the hope of one day filling the Presidential Chair. So, too, we have no doubt that men capable of doing very useful work have been led to waste their lives by the hope of handing down a name to posterity. It must be admitted that specialists are not always the most complete of mortals. Few of them approach closely to the "superior man" of Confucian philosophy, who "while there is any thing he has not studied, or while in what he has studied there is any thing he cannot understand, will not intermit his labour; while there is any thing he has not inquired about which he does not know he will not intermit his labour." And still less does restless toiling after distinction chime in with the idea of Wilhelm von Humboldt, whom Matthew Arnold calls "one of the most beautiful and perfect souls that have ever existed," and who used to say that one's business in life was, first, to perfect oneself by all the means in one's power; and, secondly, to try and create in the world around one an aristocracy, the most numerous that one possibly could, of talent and character. Those who hold these views would fain see the process of culture, mental, moral and physical, carried very far before the student's mind is suffered to be engrossed with a specialty, though the meed of honours and wealth be less; and while it is generally desirable to defer the time when the professional work of life should break in upon the work of general culture, so it is certain that it should never supersede it.—*Gazette*.

Montreal Ladies' Educational Association.

The annual meeting of this Association was held on the 7th inst., in the Synod Hall, Principal Dawson, LL. D., F. G. S., in the chair. The Very Reverend Dean Bond, Mr. Justice Sanborn, Rev. Canon Baldwin, Rev. Professor Campbell, Prof. J. Clark Murray, Rev. Dr. Cordner, Prof. Johnson and Mr. Lunn occupied seats on the platform.

Dean Bond having opened the meeting with prayer, the Chairman read a letter of apology from Judge Dunkin, who was prevented by illness from being present. The minutes of the last annual meeting, May 1873, were then read.

The Report for the year 1873-74 was next read. The following are the chief points of interest contained in it:—The past year was prosperous, spite of several disadvantages. In December last, Mrs. Molson, to the great regret of the Association, tendered her resignation of the Presidency, and Mrs. John Henry Molson was elected to succeed her. The Secretary, Miss Lunn, also resigned previous to leaving for Europe, but the resignation was not accepted, and a *pro tem.* Secretary was appointed. The course of study, under the auspices of the Association, was opened by a series of "Lectures on English History," by Professor Goldwin Smith, whose report states that "the results of the examination are not less satisfactory than they were last year. On the whole, I should say,

they are more so. The success of your experiment may therefore be regarded, I trust, as not doubtful."

This course was followed by one of fifteen lectures on Physiology, by Dr. Wright, and on Mental Philosophy, by Prof. Clark Murray. Both courses of lectures were very well attended; so well, that some disappointment was felt by Dr. Wright when only seven students came up for examination. Several of these ladies passed with brilliant success. Dr. Wright concludes his report by saying:—"My report would be incomplete were it to end without an expression of surprise from me at the high degree of excellence exhibited in many of the answers. Several of them were so perfect as to receive the full number of marks, and others so close to these as to fall short by a very small deficiency. The Ladies' Association may therefore be congratulated upon the success of its enterprise as shown in such fruits of proficiency, ripening under its endeavors to advance the accomplishments and learning of its members."

In January the lectures were resumed, and Dr. Dawson commenced a course on "Historical Geology," in compliance with a very strongly expressed wish due to the interest felt in the lectures given in 1871, on "Useful and Ornamental Stones." The students were again small in number in comparison with the auditors.

The different lecturers regretted that out of the large number of auditors, so few should present themselves for examination. It is hoped that next year the number of students examined will be very much increased. In the course on "Physiology" only eight candidates came forward, although the attendance showed 150 persons present. In "Mental Philosophy," the proportion was larger: eighteen out of forty. Dr. Dawson in his report says:—"I was somewhat disappointed that so small a number came up for the examination. It is, I think, much to be regretted that so few of the students can be induced to come up for the examinations, as it is certain that in the future the ordinary pass certificates of the Association will be highly valued by those who may be so fortunate as to possess them."

The thanks of the Association are given to Dr. Dawson for his assistance and advice, also for his liberality in having returned \$330 of the Lecture fees, having disbursed \$70 for expenses. This sum has been devoted to a testimonial to Principal Dawson, with the unanimous concurrence of the present Committee. The thanks of the Association are also due to Professor Goldwin Smith, who delivered the inaugural lecture, to a large and interested audience, on October 1st, 1872. Thirty-five students came up for the different examinations during the session. Miss Carrie Cordner alone fulfilled the conditions under which students are allowed to compete for the "Hannah W. Lyman Memorial Prize," and having passed all the examinations before Christmas, and taken first class rank in both Historical Geology and Mental Philosophy at the close of the session, both prizes have been awarded to her.

The financial condition of the Association is not quite satisfactory, several subscribers having withdrawn, and the desirability of a steady number of annual subscribers is much felt. The sum received from subscribers is \$1716; from sale of students' tickets, \$241.25. The balance from last session, \$665.52. The expenditure of the present year amounts to \$2,192.92.

The Synod Hall has been secured as a Lecture Room for the session of 1874-75. It has also been decided that each member will have the privilege of receiving with her member's ticket, either a student's ticket, not transferable, or a visitor's ticket, which can be transferred at pleasure. Arrangements have been made for a Course of Lectures on "Optics," one on "English Literature,"

and one on "Hygiene." A Course of Lectures on French Literature is also proposed. The number of lectures has been reduced to sixty. The committee suggest for the session of 1875-76, History, one Modern Language and Literature or Moral Philosophy, and some scientific subject.

Rev. Canon Baldwin moved—"That the Report now read be received and adopted, and printed for circulation." In speaking to his motion, the Canon dwelt on the wonderful influence of educated women on the national prosperity, on the status of women among the ancients, the change effected by Christianity, and illustrated by historical references his remarks on the high cultivation of ladies in different ages. He expressed deep interest in the success of the Association.

Rev. Dr. CORDNER seconded the motion, and was glad of the opportunity of testifying his interest in so laudable an undertaking as that of the Association. He considered it was doing quiet but valuable work in the community, and highly approved of its objects. He referred to the efforts of the Professors and Ladies on behalf of the cause and paid a deserved compliment to the chairman for his warm cooperation in every scheme for the promotion of sound education in this country. He approved of the reduction of the number of lectures, and alluded to the effect such an Association as this must have in completing a school education.

His Honor Mr. Justice SANBORN moved—"That this meeting, recognizing the valuable work which this Association is carrying on, pledges itself to put forth renewed efforts to secure success and permanence in the future."

In speaking to his motion, the learned Justice remarked that he was glad, though almost a stranger to Montreal, to show his interest in the work of the Association, a notice of whose inception he had seen in a paper some three years ago. He was surprised at its rapid progress, and was sure that it would continue to prove a valuable help in giving higher education to ladies. He alluded to the very false idea of an education being *finished* by a course of a year or two at a boarding school. Education in its highest sense was only finished with life. He instanced the case of Agassiz and Michael Angelo, who continued their studies to the day of their death. He referred to the interest taken now-a-days in the acquirement of knowledge, and to the gratification he felt at the ready manner in which the Association had acknowledged Dr. Dawson's valuable services.

The motion was seconded by Professor Campbell, who in the course of his remarks warned lady students not to divide their attention among too many subjects, nor on the other hand, to pursue one or two to the exclusion of other necessary branches. He advocated the study of literature, which was frequently neglected.

The Chairman made some interesting remarks on the progress of the Association and its future prospects, and after thanking the various speakers, touched on the influence of the movement and on the value of the certificates of the Association to their holders. He urged the students to submit more generally to examination in the subjects lectured upon, and advised them not to contemn 2nd or 3rd class certificates; 1st class ones could not always be got even by students at Universities. He hoped the present Association was paving the way for a Ladies' College, adding that many of the Examination papers he had seen would do credit to any Educational Institution. He expressed his gratification at the testimonial presented to him by the Ladies of the Association, while assuring them he had been quite repaid by his pleasure in the work.

The work of the coming year was next alluded to. Prof. Johnson would lecture on "Optics," with illustrations

by means of the College apparatus, kindly loaned for the purpose to the Association. "Hygiene" would be lectured on by Dr. Roddick, and there would be a course of lectures in English literature.

The Rev. Prof. Murray closed the meeting by pronouncing the benediction. The following ladies were elected office-bearers:—President, Mrs. J. H. R. Molson; Vice-Presidents, Mrs. T. B. Anderson and Mrs. Dawson; Secretary, Miss Lunn, and a Committee of thirty six ladies.—*Gazette*.

Board of Arts and Manufactures.

At the fifth quarterly meeting of the Council of the Board, held on the 12th and 13th inst., Mr. J. B. Rolland, President, in the chair, the financial statement showed a balance in hand of \$160.04. The reports of the schools of Montreal, Quebec, Sherbrooke, Levis and Sorel for the last winter were presented, and Mr. Joseph Woodley was elected, and took the chair, as President for the coming year, and Mr. Levesque, Vice-President, while Mr. S. C. Stevenson was appointed Secretary for the next quarter, Mr. Leclaire having declined re-election on account of incompatibility in the duties of Secretary of the Bureau of Agriculture and Secretary of the Council of Arts and Manufactures. Thanks were voted to both the retiring President and Secretary for their services. The opinion of the advocates for the Council on the Crystal Palace question, namely, Messrs. Crosse, Q. C., and Hon. Mr. Trudel, was given, and showed that the claims of the Council to the property were well-founded. The report of the Committee to enquire into the best means of securing technical education and the selection of a professor to superintend the classes in connection with the Council, recommended that the classes should, for the present, be entirely free; that a sum of money be granted for the purchase of six series of copies and models for the schools under the direction of the Council; that steps should be taken to obtain, if possible, a gentleman from South Kensington, England, to superintend the classes, and that, if possible, the services of Mr. Bourrassa should be secured to act in conjunction with this gentleman. The Committee also recommended that the following subjects should be taught in the schools, viz., geometry, elementary mechanics, physics, elementary and industrial, chemistry (applied), architectural drawing, modelling and building construction. The report was received, and \$500 were appropriated for the purchase of the series of copies and examples therein recommended. The next meeting of the Council was fixed to be held at Sherbrooke on the 18th of August next, at 10 a. m. The Finance Committee for the current year was appointed as follows: Messrs. L. J. Boivin, N. Beauchemin, Leclerc, White and Bulmer. The question of the Crystal Palace was again brought up by Mr. Crosse, who explained some matters in relation thereto, and showed, at length, the just and well-founded claims of the Council to that property. After some discussion by the members, the following resolution was moved by Mr. L. J. Boivin and seconded by Mr. Smith:—That, inasmuch as the permission given to the Dominion Government to use the building of the Crystal Palace for a battery of artillery will not preclude the museum of the Council being accommodated in the same building, there being sufficient room for the purpose, and one use not necessarily creating any inconvenience to the other; that the remainder of the objects of which the museum is constituted be forthwith removed to said building, and for the same reason as well as to protect the building and the possession and ownership of this Council therein and in the property, and for his more suitable accommodation, the Secretary be immediately provided with an office in the building.—Carried.

Moved by Mr. Stevenson, seconded by Mr. Lyman—That the opinions of Messrs. Crosse and Trudel on the position which the Council of Arts and Manufactures occupies in relation to the property in St. Catherine street, known as the "Crystal Palace," be received and reported in the minutes; that this Council deems it expedient to carry out the various suggestions contained therein, and for that purpose hereby authorize the President to adopt whatever measures may be necessary to maintain the rights of the Council in the property in question.—Carried.

It having been resolved that a report of the operations, &c., of the Council during the preceding year be forwarded to the Government, the Council adjourned.

College of Physicians and Surgeons of Lower Canada.

The semi-annual meeting of the Board of Governors of this college was held on the 12th inst., in the Jacques-Cartier Normal School Montreal.

Dr. Hingston was elected Governor in place of the late Dr. Smallwood; Drs. Ross and Roddick were elected members of the College.

The following gentlemen were admitted to the study of medicine after examination:—James Ward, James Leprohon, Gaspard Turcot, Philippe Gaillardet, Isaie Sylvestre, Jos. Robillard, Olivier Charbonneau, Honore Masse, A. Lapalme, Joseph Sylvain, Achille Gauvreau, Israël Joncas, Arthur Vincelette, Joseph Etienne Bolduc, Adjour Samson, Thos. Lambert, A. Methot, Edmond Barry and A. Poulin. Mr. S. Levy was admitted to the study of pharmacy.

The licence of the College was given to the following graduates:—Arthur Patrick Shee, M. D., Laval; Philippe Charest, M. D., do; Edwin Turcot, M. D., do; Charles Clement M. D., do; Louis Honoré Labrecque, M. D., do; Samuel Pouliot, M. D., do; Arthur Lyon, M. D., McGill; George Henry Christie, M. D., do; Walter Sutherland, M. D., do; James C. Cameron, M. D., do; W. A., Molson, M. D., do; Alexander Proudfoot, M. D., do; Léonidas Brunet, M. D., Victoria; Edmond Ouimet, M. D., do; Joseph E. Berthelot, M. D., do; Severin Lachapelle, M. D., do; Hermenegilde Jeannotte, M. D., do; Louis D. Hebert, M. D., do; Joseph Edward Scallon, M. D., do; Arthur Roy, M. D., do; Charles Demers, M. D., do; Louis Coyteux Prevost, M. D., do; Alfred Majeau, M. D., do; Joel Laurendeau, M. D., do; Frs. X. Mousseau, M. D., do; Stanislas Lamoureux, M. D., do; Avila Demers, M. D., do; Telesphore O. Globensky Wilson, M. D., do; Joseph Roy, M. D., do; Alex. Germain, M. D., do; Victor Moquin, M. D., do; Theodore Phenix, M. D., Louis Laberge, M. D., do; Eugene Trudel, M. D., do; Alfred Brossois, M. D., do; Edouard Ferron, M. D., do; Charles Desorey, M. D., do; Victor Elz. Brouillet, M. D., do; Arthur Duval, M. D., do; Israël Lemieux, C. M., M. D., Lennoxville; Esroum Duclos, C. M., M. D., do; David Alexander Hart, C. M., M. D., do; Joseph Campbell, M. D., Queen's College; Francis Bourk, M. D., do.

Alexander Munro was admitted to the practice of pharmacy after examination.

Home and School of Industry, Montreal.

A meeting of the ladies of the Home and School of Industry was held in Association Hall on the 18th inst., Rev. Canon Baldwin in the chair. The chairman read the twenty-sixth annual report, giving the operations of the institution during the past year. At the date of the annual meeting last year there were in the Home 39 children, and during the year there were 29 more added, making in all 78 children who have enjoyed the benefits of the Home during the past year. Of these 26 have gone to live with parents and friends, 12 have been furnished with situations, and 2 have died, leaving 38 at the Home. It is rather remarkable that the two deaths were caused by whooping cough, and that, with one exception, they are the only deaths that have taken place at the Home for a number of years. Thus far over 100 girls have been sent out to service from the Home. The thanks of the ladies were tendered to the newspapers which have published the lists of donations; also, to several gentlemen who have rendered services to the institution, more especially to Dr. MacCallum, who for nearly 20 years has attended to the medical wants of the institution gratuitously. Over \$2,000 was realized at the late Floral Festival for the Building Fund. On the 1st instant they were obliged to vacate the premises occupied by them, 109 St. Antoine street, and have taken another house on Richmond Square, for which they are to pay \$400 per annum.

The revenue during the year has been as follows:—Balance from last year, \$288.00; received for children's board, \$461.60; received Government Grant, \$320.00; received from City and District Savings Bank, \$150.00; subscriptions and donations, \$829.29; St. Andrew's Sabbath-school, \$20.00; collected for Christmas dinner, \$55.50; bank interest, \$13.13; total receipts, \$2,137.52.

The expenditure has been \$2,125.95 for the following items:—House rent, \$304.50; salaries, \$282.85; baker's bill, \$300.00; grocer's bill, fuel, \$166.60; clothing, \$105.18; for household

expenses of various kinds, including repairs, furniture, tinsmith and shoemaker's bills, Christmas presents, water rates, insurance, &c., &c., there was spent \$365.00, leaving a balance in hand of \$11.57.

Something over a year ago a piece of ground on Mountain street, containing 14,925 feet, was bought at 45 cents per foot for the purpose of erecting thereon a suitable building for the Home and School of Industry. On this purchase there has been paid \$2,000. There is at present on hand for the purpose of building about \$3,000, while another \$3,000 has been promised.

Resolutions were passed that application be made for an act of incorporation under the title of "The Hervey Institute," and that the building be forwarded with as little delay as possible. When the building is completed it is contemplated, in addition to the presents objects, to include a temporary home for young women coming from the country in search of employment; also a meeting place for a Young Women's Christian Association, to be formed on much the same principles as those for young men, where moral young women, whether engaged in service or otherwise, can resort, for Christian advice, in all cases of difficulty, and a place for a public registry of servants. These objects need no further explanation to commend them to the Christian people of Montreal, and it is very desirable that a hearty response be given to the request for more funds to enable the building to be completed as speedily as possible.

Several benevolent institutions have already branched off from the Home and School of Industry; the latest of these is the recently organized "Young Women's Christian Association," which has for its object the keeping of a Home where young women can obtain board and lodging at a reasonable rate, and also where their spiritual interests will be promoted. The public should remember that the present "Young Women's Christian Association" is entirely separate from the "Home and School of Industry."

Addresses were delivered by the chairman, Rev. Dr. Taylor, Rev. Gavin Lang, and by Messrs Clendinneng, T. M. Taylor, Morris, and McLennan, and the proceedings were concluded with the benediction.

The following ladies were elected office-bearers for the present year:—1st Directress, Miss Hervey; 2nd Directress, Mrs. Lang; Treasurer, Mrs. Holmes; Secretary, Mrs. Clark, and a committee of eight.

Chameleons.

There is a curious little lizard, the name of which is so coupled with fable that many believe it has never even existed. We mean the chameleon, which, though never seen on this continent, abounds in the old world. It is generally imagined that the reptile is capable of changing its colour at will to the brightest of rainbow hues, and there is a wide-spread popular belief that it lives on air, both of which ideas, though naturally arising from the peculiar appearance and habits of the animal, are far from the truth. Some years since, we captured a pair of these lizards among some ruins in Asia Minor; and for the three months during which they lived very comfortably in a wooden birdcage, we were enabled to study their strange peculiarities, and notably the phenomena for which M. Paul Bert, a member of the French Biological Society, has recently suggested some interesting explanations, which to us seem more in accordance with appearances than any yet adduced. The chameleon measures from five to eight inches in length, and has a curious pyramidal-shaped head, apparently separated from the neck. Its body is short and thick, and ends in a prehensile tail of medium length. The ears are concealed under the skin, the mouth is large, and the eyes, which are very prominent and full, are closely covered by a circular lid, in which is a small round perforation just in front of the pupil. The legs are long and slender, and terminate in a hand formed of five toes, divided into two bundles so as to resemble one broad finger and a thumb. By the aid of these members, and by winding their tails around the branches, the lizards climb about shrubs and trees in search of insects. Their motions are, however, very slow, and their habits sluggish in the extreme. They will cling to the bars of their cages for days at a time, giving not the slightest sign of life, except perhaps the occasional twinkle of one eye. Handling them does not seem to disturb their equanimity, as they rarely struggle as long as they are permitted to cling to a finger, while they are perfectly harmless.

The strange peculiarity of the animal, however, is its faculty of changing its colour, not in bright tints, but from a pale grey to light green, yellow, brown, reddish and violet shades, all, however, dusky and undecided. These changes sometimes occur very rapidly and are apparently provoked by anger and fear. In handling the lizard, we have noticed that, although it would, as we have already intimated, show no symptom of uneasiness, the clear light tint which covered its whole body would give place to dark brown blotches, some of which shaded curiously into black, resembling in form the spots of a leopard. The cause of the phenomenon has generally been considered to be soft granules, under the skin and of different colours, which are more or less extended according to the quantity of blood which reaches them: but the recent investigations of M. Bert show clearly that the nervous system acts directly without the intermediation of the blood. If the arteries of a member be tied so that no blood can pass, and the nerve affected, the colorations still continue; while on the other hand, if the nerve be destroyed, the tissues assume a black tint from which they do not change. It is very probable that the nerves thus acting are of the same order as the vaso-motors; for when the animal is poisoned by curare, and the other nerves are consequently paralyzed in their functions, it at once becomes black. If the sciatic nerve be electrified in a thickness at which the nerves of colour should exist, the muscles do not contract, but the tint of the member changes, proving that the current acts separately on the colour nerves. The action of the latter also persists exactly as does that of the vaso-motors in spite of the curare poison. The microscope shows tubercles beneath the skin, which become differently coloured through the singular bodies, of which they are composed, contracting or expanding as governed by the nerves.

Another curious feature of the chameleon is the independence of its eyes. It moves them separately; and when the animal sleeps it seems as if but one-half of it were awakened at a time. If a light be placed before one eye, the half of the corresponding side of the body becomes of a different colour from the other side; but the tint becomes uniform all over when the light is carried before the other organ. It would seem from this that the reptile has two distinct luminous perceptions.

So sluggish a creature, it might be supposed, would be hardly suited for catching insects, and such indeed would be the case were chasing the latter the only way of entrapping them. The Chameleon, however, resorts to strategy, and grabs its prey from a distance over which the unsuspecting fly or bug hardly deems it possible that its enemy can reach. The lizard's mode of seizing the insect is not only peculiar, but also gives further proof of the dull nature of its perception. It never uses but one eye, and, while its body is perfectly motionless, will follow the movements of its prey with intense attention until it comes within about three inches of its nose; and then a tongue will dart out, more like a streak of pink lightning than anything else, strike the insect, and carry it back into the month. This tongue, which is out of all proportion to the size of the animal (sometimes twice its entire length), is a hollow tube terminated by a fleshy knob which has a cup-like cavity on its anterior surface, always covered with a viscid fluid. It shoots out a perfectly straight rod, and strikes the insect with unerring accuracy.

M. Bert, who has dissected the operating mechanism, says that the tongue is squeezed out, just as a cherry-stone can be forced out by pressing the fruit between the fingers. Strong bands of muscles, surrounding the tongue, serve to apply the necessary pressure.—*Scientific American*.

On Analogy.

What is analogy? All words are either univocal or equivocal. A word is called univocal when it always expresses the same concept, applied in the same way to all the individuals of which it can be predicated. On the other hand, a word is called equivocal when it expresses either concepts altogether different, or concepts in some respects the same, but yet applicable to different objects after a different manner. In the former case the concept is strictly and properly equivocal, in the latter it is analogical. And here we must notice that it is very hard to draw a line between these two classes of words. Some words, indeed, are not in any sense analogical, and their different meanings are in no way connected, *e. g.*, ounce, pound, page, case, bull; but there is a large class of words about which it is

difficult to decide whether they are analogical or not. When we use the word "club" in its material or its social signification, it at first seems as if there was no common meaning, but if we look a little more closely into the ambiguous word we shall find in its different senses the common idea of union and strength. We should at first imagine that the word "tract" was purely equivocal, as meaning a pamphlet or a space of country, but there is contained in both the notion of extension, of something spread out over a certain surface. And so the merry "mill" which our sporting papers describe, derives its name from the process of beating and pounding common to the faces of those engaged in it and to the corn which is ground into flour. Indeed, there are few words in any language wholly and purely equivocal. Some writers on logic have found themselves so perplexed in the distinction between these words which have something in common, and others which are more strictly analogical, that they have divided equivocal words into those in which the equivocation is purely accidental, and those in which it springs from a common derivation or indicates some kind of accidental connection. The words which we have just mentioned would obviously come under this latter class. But we are now concerned with analogy in its strict and proper sense, where the concept is in some respects the same, but is applied to different objects in a different manner. In our very definition an analogy at once presents itself. In what sense are we using the word "concept?" Are we speaking of the formal or of the objective concept? Is the analogy to be looked for in the notion which exists within the mind, or in the object outside of us, which we regard under a certain aspect? In order to answer these questions we must say a few words on the difference between the formal and the objective concept. Every term which we employ may be said to stand for three different things. Primarily and immediately it stands for a certain idea or concept existing in our mind, originally derived from external things, directly or indirectly, through the medium of the senses, but at present purely subjective in that it forms part of our intelligence, and so is cut off from the world outside us. This is the subjective, or formal concept; it is an individual thing, a quality inhering in the mind, but yet an image or representation of something without us. In a secondary and mediate sense the term stands for some object or quality, or set of qualities, existing outside the mind, but presented to the intellect under a certain aspect, which aspect is represented in the formal concept. It may be some concrete thing, or a universal idea, or even an imaginary set of qualities which have not any actual existence, but which the mind chooses to invest with a factitious being in order to transfer them into herself under the guise of a formal concept. The objective concept is a concept only in an analogical sense, in that it forms the material out of which the formal concept is derived.—*The Month*.

Nickeling.

The double sulphate of nickel and ammonia, which is the salt that is generally used, may now be had in commerce almost pure. It is manufactured on a large scale by Joseph Wharton, of Camden, N. J., who controls the nickel market in the United States. Cast nickel plates for anodes may be obtained from the same source. The anodes should considerably exceed in size the articles to be covered with nickel. Any common form of battery may be used. Three Daniell's or Smee's cells, or two Bunsen's, connected for intensity, will be found to be sufficient. The battery power must not be too strong, or the deposited nickel will be black. A strong solution of the sulphate is made and placed in any suitable vessel: a glazed stoneware pot answers very well if the articles to be covered are small. Across the top of this are two heavy copper wires, to one of which the articles to be covered are suspended, to the other the anode. The wire leading from the zinc of the battery must then be connected with the wire from which the articles are suspended, the other battery wire being connected with the anode.

In order to prepare the articles for coating, they must be well cleaned by first scrubbing them with caustic soda or potash, to remove any grease, and then dipping them for an instant in *agua regia* and afterwards washing thoroughly with water, taking care that the hand does not come in contact with any part of them. This is accomplished by fastening a flexible copper wire around them, and handling them by means of it. The wire serves afterwards to suspend them in the bath.

If the articles are made of iron or steel, they must first be covered with a thin coat of copper. This is best done by the cyanide bath, which is prepared by dissolving precipitated oxide of copper in cyanide of potassium. A copper plate is used as an anode. After they are removed from the copper bath, they must be washed quickly with water and placed in the nickel bath; if allowed to dry or become tarnished, the nickel will not adhere.

Great care must be used through the whole process to keep all grease, dust, or other dirt from the articles to be covered, or else the result will be unsatisfactory. The whole process is one of the most difficult that is used in the arts, it being far easier to gild, plate, or copper an article than to nickel it; but if due care be taken, the results will amply repay for the trouble.—S. P. Sharples, Massachusetts State Assayer, in *Boston Journal of Chemistry*.

Lake Titicaca.

This is the most singular and interesting lake in the world. Situated on the crest of the Andes, it is the highest large body of fresh water, and as concurrent traditions point to it as the spot where Manco Capac, the first Inca, appeared and woke the aboriginal tribes from their long sleep of barbarism and ignorance, it is the historic centre of South America. Humboldt called it the theatre of the earliest American civilization. On an island within it are the imposing ruins of the Temple of the Sun, and all around it are monuments which attest the skill and magnificence of the Incas. There are also, as at Tiahuanaco and Silustani, the remains of burial towers and palaces, which antedate the crusades, and are therefore preincarial.

Lake Titicaca is about the size of Ontario, shallow on the west and north, deep towards the east and south. The eastern or Bolivian shore, being backed by the lofty range of Sorata, is very high and precipitous. The lake never freezes over, although the temperature of Puno is often 18° at sunrise. Two little steamers of 100 tons each do a trifling business. Steam is generated by llama dung, the only fuel of the country; for there are no trees within 150 miles. The steamers actually cost their weight in silver; for their transportation (in pieces) from the coast cost as much as the original price. A steamboat company has just asked from Bolivia the exclusive privilege of navigating Titicaca and the Rio Desaguadero to Lago Pampa, with a guaranty of six per cent on the capital and a share in all new mines discovered.

Professor Orton, the latest traveller in that region, calls attention to the fact that Lake Titicaca is not so high as usually given in geographical works by about 300 feet. Its true attribute is 12,493 feet, and in the dry season it is four feet less. This fact has been revealed by the consecutive levellings made in building the Arequipa railway just finished, which reaches from the Pacific to Lake Titicaca. The road rises from the sea to Arequipa, 7,550 feet; thence to the summit, 14,660 feet; and then descends over 2,000 feet, to Puno on the west shore of the lake, a distance by the track of 325 miles from the ocean. Pentland's estimates of Sorata, Illimani, and other peaks of the Andes, having started from the Titicaca level as a base line, must come down full 300 feet.—*Scientific American*.

Artesian Wells.

A recent question which appeared in our (*Scientific American*) column of answers to queries, regarding the greatest depth attained in the boring of artesian wells, has elicited some interesting letters from correspondents. We find it necessary from the information given by one writer to revise the statement that the well in Louisville, Ky., 2,086 feet in depth, is the deepest in the country, as the bore sunk for Belcher's sugar refinery in St. Louis has penetrated 2,200 feet, while that excavated for the insane asylum in the same city has reached the enormous depth of 3,843 feet, or in that locality, 3,000 below the level of the sea. This would give a water pressure at the bottom of 1,293 pounds to the square inch. Another correspondent tells us of a bore in the old world which is deeper than the one last mentioned by several hundred feet. It is situated in the village of Spenburg, some twenty miles from Berlin.

The government, it seems, in order to obtain a supply of rock salt, began the sinking of a shaft 16 feet in diameter. At a depth of 280 feet salt was reached, but excavations were continued, the bit still remaining in the salt deposit, which thus exhibits the prodigious thickness of 3,907 feet.

The supply of water from an artesian well is practically inexhaustible. At Aire, in Artois, France, a well, bored over a century ago, has since then flowed steadily, the water rising 11 feet above the surface at the rate of 250 gallons per minute; and at Lillers, in the same country, one well has yielded a continuous stream since the year 1126. This fact, coupled with the large amount of water delivered, renders the artesian well of the greatest value for the irrigation of desert plains. Up to the present time, some seventy-five shafts have been sunk in the Desert of Sahara, yielding an aggregate of 600,000 gallons per hour. The effect of this supply is said to be plainly apparent on the once barren soil of the desert. Two new villages have been built and 150,000 palm trees have been planted in more than 1,000 new gardens. Water, it is stated, is reached at a very slight depth, in some cases hardly 200 feet.

The success attending the efforts of the French engineers in Africa has led to the excavation of numerous wells in the dry alkali plains along the line of the Union Pacific Railroad. There is a desolate and arid section, extending along the Bitter Creek Valley for a length of about 120 miles, and varying in width from 20 to 50 miles. Since the building of the road, water trains have been running over the whole distance, supplies being obtained from the Green and other rivers. The cost of running these trains was about \$80,000 a year. It became therefore absolutely necessary to produce some other means for getting water for the locomotives, and the miners working in the coal mines along the route. The only relief available was boring artesian wells, and a correspondent of the *Tribune* says that, last year six were begun. The subsequent success has been all that could be desired. The first well is at Separation, 724 miles from Omaha, and the last one is at Rock Springs, (1,145 feet deep) 832 miles. Another is in progress at Red Desert. There are layers of clay mixed with sandy loam, clear sand and water-worn pebbles (in which the supply of water is usually found), layers of sandstone of varying degrees of density, and beds of sulphate of alumina and iron chemically combined, resembling the peculiar bluish clay of some of the surface soil. The Rock Springs well rises 26 feet above the surface, discharging at the latter 960 gallons per hour. The water in the various wells, it is said, sometimes holds in solution as much as 280 grains of mineral salts to the gallon, and hence produces undesirable effects on steam boilers. It is believed, however, that for agricultural purposes these salts could, with plenty of water, be washed out, when the result would be a remarkably productive soil, which would be as valuable as guano. A flowing well furnishing 1,000 gallons per hour will water a section of 640 acres.

An artesian well, we learn, is also in progress at Denver; it is already down 800 feet, and water has risen nearly to the surface. The government has appropriated \$10,000 to sink one at Fort D. A. Russell, and it is now nearly 900 feet deep. A well 1,000 feet deep costs about \$10,000; and out on the plains, this outlay would make a most productive farm and might be made the nucleus of a stock range of thousands of acres.

Béton Coignet Artificial Stone for Ornamental Architecture.

Some seventeen years ago, M. Coignet introduced his *béton* stone into France. Although at first encountering popular prejudice, the material speedily made its way, through its intrinsic merit, into favour, and finally, after being experimented upon for a period of two years, was adopted by the French government in the construction of many important edifices and structures. Forty miles of sewers in Paris, the immense aqueduct of Le Vanne, the arches which cross the sandy valley of Fontainebleau for a distance of thirty-one miles, the supporting arches of the Exposition building, the docks at Bourdeaux, and in various others prominent engineering works the *béton Coignet* has been entirely employed; and also in Egypt the material has been used, for lighthouses and in forming the massive blocks used in the building of the Suez Canal. In a large number of private and public edifices in the vicinity of

this City (New York), recently erected, this stone has been employed. Prominent instances among these are the arches, columns, and traceries of the great Catholic Cathedral, now in progress on the corner of Fifth Avenue and 50th street, and in the various architectural ornamentations of Prospect Park, in Brooklyn. This material is specially advantageous for decorative purposes, as it offers great facilities for the reproduction of ornamental detail. A design, once well modelled and prepared for carving, can readily be repeated.

A large new manufactory of *béton Coignet* has been established by the New York and Long Island Coignet Stone Company—the works are very extensive and are capable, we understand, of turning out fronts of ten ordinary houses per day, besides a large quantity of fine ornamental work. The process of manufacturing consists in first grinding down the constituent elements of the stone to be imitated, and mixing them by machinery until they reach a plastic state. The moulds are then filled by a peculiar process which entirely excludes the air, and are immediately removed. The stone within a few days, is ready for transportation, and continues to increase in density.

The *béton* is impervious to water; and so far as experience proves, withstands the frost of extreme northern climates, and will withstand a crushing pressure of about four tons to the square inch. Structures composed of it are much lighter than those of natural stone, while the strength is equal, if not, in many instances, greater. A cubic foot of the material weighs about one hundred and forty-six pounds. Walls of it present a homogeneous mass, and are not liable to the accidents common to brick and mortar structures.

We learn that, since the failure of both granite and marble in the great fires of Chicago and Boston, tests have been made as to the capability of *béton coignet* to resist intense heat, and the results show that it neither explodes like granite, calcines like marble, nor warps and twists like iron structures. It is, besides, a non-conductor of heat to no small extent, and therefore tends to check the passage of conflagrations from building to building.

General Gillmore, of the United States Engineers, some time since visited Europe for the express purpose of inspecting the structures made from this stone, and on his recommendation the government has adopted it for use in the construction of the casemates, sally-port, floors, and other portions of Fort Wadsworth, on Staten Island. It would be difficult, we imagine, to limit the employments for which the material appears eminently suitable. The cost of manufacturing is said to be about half that of natural stone when cut.—*Scientific American*.

MISCELLANY.

Mill's Education.—Among the numerous misrepresentations now current of John Stuart Mill's Autobiography, perhaps none is more strikingly at fault than that which describes the unique education which he received from his father as an education of cram. It is true that Mill became an accomplished scholar when a mere child; and it is quite natural for people to suppose that so much knowledge could have been got into so young a head only by being crammed in. But this view of the case is very distinctly repudiated by Mill himself, who certainly was quite capable of analyzing the process to which he was subjected, and was quite candid in giving his opinion of it. "Most boys or youths," he says, "who have much knowledge drilled into them have their mental capacities not strengthened but overlaid by it. They are crammed with mere facts, and with the opinions or phrases of other people, and these are accepted as a substitute for the power to form opinions of their own; and thus the sons of eminent fathers, who have spared no pains in their education, so often grow up mere parroters of what they have learnt, incapable of using their minds except in the furrows traced for them. Mine, however, was not an education of cram. My father never permitted anything which I learnt to degenerate into a mere exercise of memory. He strove to make the understanding not only go along with every step of the teaching, but, if possible, precede it. Anything which could be found out by thinking I was never told until I had exhausted my efforts to find it out myself." And this testimony not only settles the question concerning the character of Mill's education, but expresses in a lucid and forcible way a vital principle in the proper education of every child.—*Christian Union*.

A Valuable Invention for Saving Life at Sea.—The *Belfast (Ireland) News Letters* says a public trial of "Dolby's Water-Bottle Lifebuoy" took place recently in the harbour, near the Queen's Bridge, in the presence of a large concourse of people. At two o'clock precisely a full-grown labouring man jumped into the river with his boots and clothes on, and with nothing more to float him than a tin water-can, known by the name of "Dolby's Patent Water-Bottle Lifebuoy." The effect of this water-can was that, although the man was offered money by some of the bystanders if he could sink himself for a few seconds, he found it utterly impossible to do so. The next experiment tried was still more startling, for the man, having secured an additional water-can to his back, again went into the water with a 14 lb. weight in one hand and a 7 lb. weight in the other, and, notwithstanding this, he was enabled to carry his head high out of the water. At the termination of the trial the inventor, who was present, was congratulated on the successful result of the experiments. This new lifebuoy is made in the form of a parallelogram, about three inches deep, with rounded edges, and slightly curved to fit the body, to which it can be strapped. It is a simple tin water-bottle, capable of containing five or six quarts. It is convertible at a moment's notice into a lifebuoy of the best description. The cost of this useful bottle is only a little beyond that of the ordinary bottle which the emigrant is compelled to have amongst his equipments. We learn with satisfaction that Mr. Henry Gowan has become agent for this patent lifebuoy, in order that it may be supplied to all emigrants leaving the port.

Rendering Wood Uninflamable.—The late fire at the *Pantechicon* gives interest to any invention having for its object the prevention of similar disasters. A few days since experiments were made at *Woolwich* to test a process discovered by Dr. Thomas Jones for rendering wood uninflamable. The first experiment was with some shavings, which, after being soaked in the preparation, were thrown on a bright fire. Instead of blazing they were merely charred, without emitting flame. On a match being applied to a heap of prepared shavings they refused to ignite. A large pile of prepared wood, being saturated with paraffin, remained unburnt, although the oil on its surface gave forth fierce flames. When a similar test was applied to a heap of unprepared wood the greater part was consumed in a quarter of an hour. But the most crucial experiment was the last. A quantity of gunpowder, packed in a wrapper of prepared brown paper, was inserted in a cask previously saturated with Dr. Jones's solution. This barrel being turned on its end, paraffin was lighted on the top, with no effect either on the wood or inclosed powder. The barrel being reversed, lighted shavings were dropped upon the packet of powder, but they burnt out without causing any explosion. In fact, the powder, on being taken out and submitted to experiment, retained all its strength. Dr. Jones does not claim for his invention that it renders substances incombustible. All he maintains is, that by employing his process the progress of a fire would be greatly delayed, since substances saturated would give off no flame. The late *Woolwich* experiments prove that, under certain conditions, this very desirable result can be attained. Until more extensive trial it is impossible to decide upon the exact merits of this invention, and we are therefore glad to see that the experiment will be repeated on a larger scale. Should these prove equally successful with the last, one influence leading to the rapid spread of fires will disappear. At one time the flames at the *Pantechicon* threatened to seize *Belgravia*, although the building was completely detached. No one who saw the fiery tongues leaping over *Lowndes square* will doubt the great importance of any invention claiming to prevent their emission.

Influence of the Moon on the Weather.—*Wierzbicki*, Assistant at the *Observatory at Cracow*, has made use of forty-five years of continuous observations on the climate of that station to investigate the influence of the moon. The first person who made any practical investigation of this subject appears to have been *Laplace*, who studied the influence of the moon upon the height of the barometer. In the same direction also *Bouvard* laboured, basing his investigation on twelve years of observations at *Paris*, and he proved that the influence of the moon upon our atmosphere was so inconsiderable, at least for the latitude of *Paris*, that it might be considered as not existing at all. *Wierzbicki* divides his investigation into two sections; studying first the influence of the synodic revolution of the moon, or the time that the moon occupies in passing through all its phases, and

further subdividing the period of forty-five years into two periods of nineteen years each, and showing that for both of these periods, as well as for the entire periods, as well as for the entire period of forty-five years, the clear weather (*i. e.* the number of clear days) shows scarcely any trace of a connection with the phase of the moon. During the lunar month, in fact, the number of clear days increases and diminishes five times, and without any apparent regularity. With regard to the rainfall, it appears that in the first period of nineteen years the maximum rainfall occurs between the first quarter and the full moon and the least rainfall between the full moon and the last quarter. On the other hand, the last period of nineteen years leads to a different result; so that, from the whole series of observations, there results only a very slight indication of a connection with the moon—which connection, if it actually exists, would require for its demonstration a series of measurements of the rainfall numbering through a much longer period of years. The result attained by the study of the number of days on which rain fell substantially agrees with that from the study of the quantity of rain fallen, in showing that the moon has very little, if any, influence upon processes in our atmosphere. The same author, in studying the anomalistic revolution of the moon, gives, by a very careful process of reasoning, two conclusions different from those advocated by *Schiaparelli*, in finding no trace of the influence of the distance of the moon from the earth upon meteorological phenomena.

Merchant Fleets.—The following interesting statement of the comparative strength of the merchant fleets of the chief maritime nations, is published in the *French Journal Officiel*. European sailing vessels under 50 tons burthen, and American under 80 tons, are not included:—

	Sailing Vessels.		Steamers.	
	Vessels.	Tonnage.	Vessels.	Tonnage.
England.....	20,832	5,320,089	3,061	2,624,431
America	6,786	2,132,838	403	483,040
Germany	3,834	893,953	200	204,894
Norway.....	3,930	1,137,177	88	41,602
Italy.....	4,220	1,126,032	103	85,045
France.....	3,973	893,952	392	316,755
Spain.....	2,867	540,211	202	138,665
Holland.....	1,447	397,232	95	72,753
Greece.....	1,955	392,294	8	3,390
Russia.....	1,327	347,744	114	67,522
Sweden.....	1,827	327,409	143	53,327
Austria.....	965	336,113	91	84,155
Denmark.....	1,226	170,834	71	34,498
Portugal....	415	93,815	17	14,536
Belgium....	46	14,704	42	30,444
Turkey.....	224	34,711	9	3,049
Various.....	407	157,022	109	70,067
Total.....	55,281	14,311,129	5,148	4,328,193

Mortality of British Statesmen.—It is somewhat remarkable, says the *London Telegraph*, that while, in the Parliament which has just been dissolved, only 55 members should have been removed by death from the House of Commons—an assembly numbering more than 650—the House of Lords, a body containing 200 fewer members, has witnessed the loss of 108 peers. In the first year of the existence of the Parliament—1869—the number of peers whose deaths were recorded was 32. These included men of all ages, from the venerable Bishop of Exeter, who was 91, to the Earl St. Maur, the only surviving son of the Duke of Somerset, who was only 33. Beside the Bishop of Carlisle, Manchester, and Salisbury. The Earl of Randor, a liberal before the dawn of the present century, was removed at the great age of ninety. Lords Broughton and Tanton, known to the politicians of a former generation as Sir John Cam Hobhouse and Mr. Labouchere respectively, died within a few weeks of each other, and their titles became extinct. The deaths of the Earl of Derby, three times Prime Minister, and of the Marquis of Westminster, were announced almost together. 1866 witnessed the deaths of the Earl of Glasgow, well known as a patron of the turf; Lord Stanley of Alderley, postmaster-general in the cabinet of Lord Palmerston; and the fifth and sixth Earls of Kingston. Lord Hawke also died. In 1870 the House of Lords lost twenty of its members. Amongst those were the Marquis of Cholmondeley and Lord Willoughby d'Eresby, the Bishop of Chichester, the Earl of Clarendon, the Earl of Roden, Viscount

Session of February 3, 1874

MODEL SCHOOL DIPLOMA, *Second Class* (E):—Mr. Wm. U. Taylor.
ELEMENTARY SCHOOL DIPLOMA, *First Class*:—Misses Kate F. Campbell, Maria J. Cochran, Janet McDougall, Catherine M. Martin, and M. Wm. U. Taylor
Second Class:—Misses Nancy Campbell and Rose-Maria Rooney.
T. A. GIBSON, Sec'y.

—
STANSTEAD.

Session of November 21, 1873.

ELEMENTARY SCHOOL DIPLOMA, *First Class* (E):—Misses Laura Keith, Jennie Morgan, Abbie L. Ball, and Emma J. Baldwin, Messrs. Henry H. Andrews, James Gardner, Wm. G. Gardner, George B. Jinsler, Almon H. Noyes, and Francis G. Gale.
C. A. RICHARDSON, Sec'y.

Session of February 2, 1874.

ELEMENTARY SCHOOL DIPLOMA, *First Class*, (E):—Misses Ettie L. Merrill, Sarah P. Wilcox, Messrs. W. F. Giddings, J. E. Wright, James Nish and Charles W. Cate.
C. A. RICHARDSON, Sec'y.

ERECTIIONS, ANNEXATIONS AND CHANGES OF SCHOOL MUNICIPALITIES.

The Lieutenant-Governor,—by an order in Council, dated 12th March last,—was pleased

To unite, for school purposes, the two Municipalities of Saint Malachie, in the Co. of Dorchester,—to take effect from the 1st July next.

The Lieutenant-Governor,—by an order in Council, dated 18th March last,—was pleased

To order that, to the Village of Aylmer, in the Co. Ottawa, certain lots, at present forming part of Hull, should be united,—namely, those bounded on the East by the road known as "Chemin des Chênes" which crosses lot fifteen of the first and second ranges of the Township of Hull longitudinally; On the North by the macadamised road, known as "the Turnpike Road," as far as the former limits of the Municipality of the Village of Aylmer; on the South by the River Ottawa;

To give to the Municipality of Saint-Michel-de-Beauport, Co. Quebec,—the following limits,—namely,—bounded on the South of the St. Joseph Concession by the division line between the property of Antoine Marcoux and that of James Dinning, continuing said division line to the East as far as that of Louis Marcoux, and to the West of the lands of Antoine Marcoux the line continues to the level North of the Concession Road, St. Joseph in a straight line as far as the Parish of Charlesbourg, to the South of Concession Saint-Michel by the lands called *Grand Clos*, owned by Louis Marcoux, Amable Langevin, Charles Vallée, Joseph Parent, Félix Parent, Joseph Robert, père et fils; Joseph Polycarpe Binet, and Fabien Parent; to the East in the St. Joseph Concession, by Louis Marcoux; to the East of the St.-Michel Concession, by Jean Marcoux; to the East in the Sainte-Thérèse Concession, by Joseph Giroux, representative of Widow Pierre Dubeau; above Sainte-Thérèse, the neighbours to the East of the line of Joseph Giroux, if this line be prolonged as far as Laval, are unknown; to the North by the Parish of St. Charlesbourg for all the above Concessions.

The lands above described will for the future form part of the Municipality of Beauport.

The Lieutenant-Governor,—by an order in Council, dated 24th March last,—was pleased

1. To erect,—into a School Municipality, to be known by the name of "Sault-au-Matelot," in the Co. Saguenay,—the following:—Extending to the West of the Mill along the public road as far as the property of Ignace Tremblay, inclusive; to the East as far as the residence of François Desbiens, also on the public road;

2. To erect, into a School Municipality, to be known by the name of Sainte-Pudentienne, in the Co. Shefford, the new Parish of this name, with the same limits that it has for religious and civil purposes;

3. To annex to the Municipality of Lambton (Saint-Vital) in the Co. Beauce, the Township of Price, in the same County, for School purposes, with the same limits it has for religious and civil purposes;

4. To annex to the School Municipality of Kingsey, in the Co. Drummond, the lots nos. 24, 25, 26, 27, and 28 of the Fourth Range of the Township of Simpson, lots 25, and 26 of the second and third Ranges of the same Township.

The Gilchrist Scholarship, 1874.

Candidates residing in the Province of Quebec, who wish to compete for these scholarships, are hereby notified that the examination will be held on the last Monday of June next in the city of Quebec. Any further information may be obtained on application to the Ministry of Public Instruction, Quebec.

DISSOLUTION OF BOARD OF SCHOOL TRUSTEES.

Notice is hereby given that the Dissentients of St. Pie, in the County of Bagot, having had no School in operation for more than a year, either in their own Municipality or conjointly with other Trustees in a neighboring Municipality, and that they are not taking any steps to carry out the school law, I shall recommend the Lieutenant-Governor in Council to order that the Board of Trustees for the Dissentient Schools of said Municipality shall be declared dissolved after the expiration of three months from the date of the present notice, in conformity with Sec. 16, Cap. 16, 32 Vic.

(Signed) G. OUMET,
Minister of Public Instruction.

Quebec, February 1874.

Wanted.

The School Commissioners of Cape Despoir, Gaspé, want, for 1st July next, three Teachers holding First Class Elementary School Diplomas and capable of teaching English and French—to whom liberal salaries will be paid. Apply to

REV. FRANCIS McDONNELL, Pres.,
OF
PHILIP ABERN, Sec.-Treas.

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Printed by Léger Brousseau, 7, Buaie Street, Quebec.