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The Canada School Journal.

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The Canada School Journal

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CANADA SCHOOL JOURNAL HAS RECEIVED

*An Honorable Mention at Paris Exhibition, 1878.
Recommended by the Minister of Education for Ontario.
Recommended by the Council of Public Instruction, Quebec.
Recommended by Chief Superintendent of Education, New Brunswick.
Recommended by Chief Superintendent of Education, Nova Scotia.
Recommended by Chief Superintendent of Education, British Columbia.
Recommended by Chief Superintendent of Education, Manitoba.*

The Publishers frequently receive letters from their friends complaining of the non-receipt of the JOURNAL. In explanation they would state, as subscriptions are necessarily payable in advance, the mailing clerks have instructions to discontinue the paper when a subscription expires. The clerks are, of course, unable to make any distinction in a list containing names from all parts of the United States and Canada.

The CANADA SCHOOL JOURNAL is read by a gratifyingly large proportion of the Teachers of the Dominion. We cannot conceive of the Conductors of a public Journal ministering to the literary tastes and professional aims of a worthier class of readers. We aid, we trust with some degree of effectiveness, in a work of immense magnitude and importance, a work none the less grand and momentous because its processes are often silent and imperceptible. To promise for such a constituency as ours a suitable variety of Educational aliment involves more labour and care than would at first appear. Our task would be easy if we were the heralds of some particular reform, the champions of some specific idea, or institution, or hobby. Still easier would it be did we play the part of an indiscriminate critic, or faultfinder, a regular *ensor morum* in every thing pertaining to Education. Ours is the nobler, but more difficult duty of providing wholesome but stimulating nutriment for the great teaching staff of the Dominion, supplementing other means of professional instruction, bringing the Educational thought and effort of the West and the East together, in short, making the CANADA SCHOOL JOURNAL the instrument through which, both the philosophy and the history of Canadian Education shall find expression.

"QUESTIONABLE ADVERTIZING" FOR PUPILS."

We have on several occasions called attention to the fact that some Collegiate Institutes were, by advertizing circulars, magazines, and agents, endeavouring to draw the best students from all parts of the Province to their classes. We regarded such practices with alarm, as they could evidently lead to but one result; the destruction of our general system of High Schools throughout the Province, and the building up in its stead of a few large institutions. A result so calamitous as this we have striven to prevent, and we are much gratified to note that the results of the various examinations this year have fully sustained our contention, that as good, and in many cases better work was done in the smaller High Schools, than in those

more pretentious Institutions which were endeavouring to make capital for themselves at the expense of the other Institutes and High Schools.

The illustrations of this fact are abundant. At the University examination, many of the High Schools stood proudly at the top beside, the best of the Collegiate Institutes. In the Intermediate examinations the results were even more notably in favour of the smaller schools, as will be seen by an examination of the results which we publish in another column.

There is no more striking instance of this than that afforded by a comparison of two schools in the same district. The City of Hamilton has surrendered the whole of its once excellent public school system to the principal of the Collegiate Institute. The direct aim of the efficient public school staff of that city is now to fit their pupils for passing the Entrance Examination to the Collegiate Institute. The pupils attend very regularly, the teachers work faithfully, and Mr. Dickson therefore gets good material, and what is of vast importance, he receives his pupils at an early age. It must also be remembered that, in order by one stroke of policy to secure a yielding subordinate and a county assistant in gathering pupils, Mr. Dickson opposed the appointment of eligible Hamilton men, and favoured the appointment of the Inspector of Wentworth to the nominal position of Inspector of Hamilton. The other High Schools of Wentworth know too well how the brightest students have been swept from their vicinities to Hamilton. Notwithstanding these unequalled privileges, and the unique methods of advertizing for good students which Mr. Dickson adopted, his school only succeeded in passing 24 candidates. The small village of Caedonia, a few miles from Hamilton, passed 23 candidates. Comment is unnecessary.

It is not the number passed, but the number "plucked," that decides the inefficiency of a school. The fact that a school like that in Strathroy passes 18 out of 21, while Hamilton only passes 24 out of 89 is clear proof of the soundness of our advice to those who seek higher education, "be true to the institutions of your own district."

It is only reasonable to expect that without the aid of the agent at teachers' conventions these contrasts will be even more striking in the future, unless the Hamilton School Board reforms the anomalous system of schools now in existence in their city. Whatever may be said of a union between High and Public School Boards, there seems to be no good result from placing the control of the Public Schools in the hands of a High School Master, if he is unacquainted with Public School work.

The High School Masters' Section of the Ontario Teachers Association passed a resolution at their late meeting condemning what they named "questionable advertizing." This must not be understood to mean making announcements of the facilities afforded by schools for the various classes of students, which is of course proper and commendable.

FORM LEGISLATIVE ASSOCIATIONS IN COUNTIES.

So long as teachers are content to be merely the guides of the young they will be treated with disrespect by a large portion of the community. Even *respectable* newspapers sneer at a man if he is "only a teacher." The teacher should be a man of better training and more culture than the majority of the community among whom he labours. He is neglecting a duty which he owes to himself and those around him, if he does not make his higher training and culture felt in his district. He should persevere, in spite of repeated discouragement and frequent failure in his efforts to awaken a desire for more and better reading, to elevate the character of social meetings, by the introduction of a few interesting literary exercises, and to organize and conduct some kind of a literary association during the autumn and winter months.

He should do more than this however. He should aim to be a leader in the formation of public opinion. He can do much to guide his fellows, without making himself obnoxious by sneering at their ignorance or ridiculing their prejudices. Especially with reference to educational matters the teacher should direct the action of his section. He should fit himself for an intelligent defence of his profession from the sophistical attacks of its opponents, and he should never be cowardly enough to listen to such attacks without repelling them in a decided manner.

What the teacher should do for his section the Teachers' Association should do for the county, and especially for the county's representative in the Local Legislature. It cannot be expected that he can keep abreast of the times in educational matters in addition to attending to his private business and official duties. Even teachers find it sufficiently difficult to become fairly acquainted with their own work in its methods and its philosophy, when they devote themselves exclusively to its study. Those whose duty it is to legislate on educational matters will generally be thankful for information and suggestions coming from those whose practical experience best fits them to advise on these subjects.

The Legislative Committee of the Ontario Teachers' Association reported in favour of the organization of local legislative committees in each inspectorial district. This report was adopted at the late meeting, and we hope the recommendation will be carried out. Legislators will receive the benefit of counsel with reference to subjects about which in most cases they can really know very little, and teachers themselves will gain not only by improved legislation, but in the most essential element of self-respect. This will necessarily develop as their sphere of influence widens, and opportunities for working unitedly are increased. These local associations would be of great service to the Provincial Legislative Committee in collecting information and statistics. By all means let the local committees be formed.

RESTRICTIONS ON SCHOOL BOARDS.

Every man has a right to his opinion. He has also a right to advocate his views, provided they are not treasonable or

immoral. We would not like to see any man's liberties lessened, but we would not object to the enactment of a law which would prohibit the adoption by Parliament of undigested opinions, simply because they may be stated forcibly by some member whose personal interests have blinded him to the rights of others. Either one of two things might fairly be expected: important reactionary amendments should not become law until the session following the one in which they are introduced, or some one in the house should be sufficiently well-informed to be able to expose fallacies, however loudly they may be proclaimed by interested parties.

It is a well-known fact that there are in Canada, and, indeed, in every civilized country, certain classes who would root out utterly a national system of public schools. There are first the people who have too much tone to send their own children to a public school. Then we meet the sectarians, who oppose what they designate the godless secular schools. There are also the rich who have no children, and who are too often narrow, selfish and grasping, who regard it as an outrage that they should have to help to pay for the education of the children of other people.

These people are not strangers, neither are they new foes. Their great grand-fathers were just as ungenerous and just as narrow-minded as they are. Unfortunately, however, there are times when they succeed in gaining their desires, in part at least. This does not follow because they themselves are any wiser, or their arguments any stronger, but because those who should withstand their aggressions are not prepared for duty.

During the session of the Ontario Legislature in 1879, one of the members introduced a resolution proposing to take from school boards their right to provide accommodation for the pupils resident in the municipality or section whose school interests they were elected to control. He was a large rate-payer in a section in which he did not reside, and he claimed that the trustees should have no power to expend money on capital account. He did not argue the case with a tithe of the ability which had been shown in urging the same views in 1851, but while his abler predecessors were defeated, he was completely victorious. He was spared the trouble of effort in accomplishing his reactionary work, too, for the Government asked him to withdraw his notice of motion, and incorporated his resolution with the amended school bill of that year. Protests came from many parts of the country, the amendment was amended so as to remove its worst features, and was submitted in a harmless shape, but during the last two days of the session was passed in its most objectionable form.

We are glad to see that the opposition to the measure, instead of remaining passive, is rapidly becoming active and decided. A resolution calling for its repeal was unanimously passed at the Provincial Convention in August, and we confidently hope that Mr. Crooks will give the matter his most careful consideration. We are convinced that if he does so he will agree with the views of his great predecessor and with the whole teaching profession, that the principle destroyed by the 29th amendment of 1879 was the "Samson lock" of the Public School system of the Province.

MATHEMATICS AT THE INTERMEDIATE.

Our readers well know that certain men have, during the past few years, laboured hard to make the word "mathematics" distasteful to students and politicians, with the single aim of injuring one of the ablest educators of our country. Unfortunately for him, he was not only recognized in America and England as an able mathematician, but he was a man of power and influence in his own country, and he could not always be brought to see that he was intended by his Creator solely to advance the personal interests of a few selfish and vindictive men. Failing to injure him by other means, they raised the cry of "mathematics!" and endeavoured to produce the impression that through the influence of Dr. McLellan the study of mathematics was being unduly forced into prominence in our High Schools. When, at the beginning of this year, he found it desirable to rest for a time from a portion of his work, these gentlemen greatly rejoiced, and impatiently waited for the coming examinations, that they might express their satisfaction at the change of examiners in mathematics. The hour at length arrived, and, it is said, by pre-arranged plan several of these "guileless beings" wrote to the Minister of Education expressing their unbounded satisfaction with the mathematical papers for the Intermediate, each taking special care incidentally to contrast them with those of previous years. Unfortunately for them and their wily schemes, mathematics never before carried such destruction among their ranks as this year. Some of them are reported to have lost every candidate through the papers of which they so highly approved.

We do not wish to be understood as objecting to mathematics; neither do we say one word against the very able and judicious mathematical examiners of this year. We merely record the discomfiture of a few designing men in their last attempt to injure one of our ablest educators.

RESUSCITATION OF THOSE APPARENTLY DROWNED.

There has been an unusually large number of deaths from drowning in Canada during the present season. Travel by water is becoming more and more popular, and every year shows more clearly the necessity for providing against avoidable death by drowning. The art of swimming and floating should in some way be more universally taught and practised. The method of resuscitation should also be taught, and it may be introduced and explained in any school without difficulty. We are sure that the teachers throughout the Dominion will join us in expressing gratitude to Dr. McLaughlin, M.P.P., for the very concise, clear, and simple rules contained in the article in another column of this *Journal*. There are several points of detail, introduced in these rules, which are of vital importance, and which have been overlooked in all other codes with which we are acquainted.

With a view of making the rules more practically useful, we have had cuts specially prepared for the article, and we strongly urge all teachers of classes above the second book to explain in theory, and to illustrate practically before their classes the

mode of operation most likely to restore to consciousness those apparently drowned.

A pupil should be operated upon by the teacher and one or two assistants from the senior pupils, or the pupils themselves may go through the various steps, in turn, under the guidance of the teacher. The Toronto School Board has decided that the method of resuscitation shall be taught in every school in the city.

Dr. McLaughlin has, on former occasions in the Legislature, shown the deep interest he takes in the welfare of both the teachers and the pupils in our schools. We trust that he may continue to champion the cause of long holidays, and due attention to hygienic demands in schools, and we will regard it as a privilege to assist him in his good work.

ONTARIO TEACHERS' ASSOCIATION.

HIGH SCHOOL SECTION.

The proceedings of this section were of special interest and importance, on account of the subjects under discussion. At the meeting of the association last year, this section appointed a committee on Legislative Aid to Secondary Education, including the Upper Canada College question, and also that relating to the grading of secondary schools into High Schools and Collegiate Institutes. This committee had partly matured a scheme for the grading of High Schools and the distributing of the legislative grant; but, before their report was submitted to the section, a Memorandum was issued by the Minister of Education, inviting this committee and the executive of the section, together with the H. S. Inspectors, to consider a number of questions, including that of the special committee.

This joint committee met on Monday preceding the convention, and, after frequent and prolonged sessions, arrived at certain conclusions, which were embodied in their report to the full section on Wednesday.

The proceedings were characterized by an unusual amount of pointed, earnest discussion; and the work accomplished is regarded as very satisfactory. Although several questions were discussed which involved the consideration of the special interests of the different grades of schools, the best of feeling prevailed, the *general good* of the High School system being kept uppermost.

The report was considered clause by clause, and the following are the resolutions finally passed by the section:

- 1st. That the fixed grant to each High School or Collegiate Institute be one-fourth of the amount paid for teachers' salaries.
- 2nd. That a portion of the grant be given on general average attendance, and that a further sum of say \$3 per pupil be granted on the average attendance during the preceding year, of those who pass the intermediate examination.
- 3rd. That the clause in the statute relating to the establishment of Collegiate Institutes should be repealed in so far as regards the required attendance of a certain number of boys in Latin or Greek.
- 4th. An amendment was substituted—That in the opinion of this section Collegiate Institutes should continue to exist, but that the basis of establishment and continuance should be broadened by including girls as well as boys, and by recognizing other studies as well as Latin and Greek; to which was added, that in the opinion of this section no school should receive a total grant of less than \$400, or more than the highest grant paid to any school this year (1881).
- 5th. That in the interest of secondary education it is desirable that a minimum fee of

say \$5 per annum should be established in all High Schools, provided some arrangement be made to meet the case of those towns which contain High Schools, and whose Public Schools contain no 5th and 6th classes.

Our readers will see that this disposes for the present of the question as to the necessity and desirability of Collegiate Institutes. Some have thought that this class of schools was anomalous and quite unnecessary in the system, and, particularly that the special grant they receive ought to be taken from them. It is evident that the very full discussion of this question has accomplished much good, and brought the masters to devise such measures as are likely to perpetuate these schools, and possibly increase the number, at the same time placing them on a more defensible basis. According to the above scheme, any school may qualify in Latin if desirable, but other schools unable to reach the average of sixty boys in classics will be able to attain Institute rank by specializing in some other department. This meets a very generally expressed demand, and will place girls on an equality with boys.

The first resolution is very well calculated to encourage Boards of Trustees to liberality in the matter of salaries. It is well known that as a class, High School teachers are insufficiently paid, and this rule will, if adopted, tend greatly to improve the present condition of things.

The fourth clause very wisely proposes a limit beyond which no school may go in receiving government aid. This was, of course, necessary after passing the first clause; and will tend to a more equitable distribution of the grant among the lower grades.

The fifth clause we believe was passed on a very small majority, since, while it is thought there is a growing feeling in favor of fees, a difficulty presents itself, first in the case referred to, where parents might feel disposed to insist on free tuition in the Public Schools through the fifth and sixth classes—thus personally saving High School fees, but putting *the town* to the inevitable expense of additional teachers for these forms. There is another objection to hastily making any change, from the fact that some High Schools in towns separated in the county receive large grants from County Councils on condition of there being no fees. The imposition of fees we think might be left with the local authorities, since no compulsory scheme appears at present generally applicable.

The following additional resolutions were passed.

It was moved by Mr. McHenry, seconded by Mr. Bowerman, and carried, That in the opinion of this section the standard for admission to High Schools should remain as at present, but that some suitable elementary text book in English History should be prescribed for Public Schools.

Mr. Millar moved, seconded by Mr. Hodgson, That this section thinks that questionable advertising and like methods of inducing students to remove from institutions to which they fairly belong, for the purpose of building up large Collegiate Institutes and High Schools, have the effect of lowering the professional respect of teachers. Carried *nem. con.*

What questionable advertising meant was not plain, and the Executive Committee was requested to define it, and report at the next annual meeting.

A motion by Mr. McHenry, seconded by Mr. Fessenden, was carried, requesting Messrs. Seath and McMurchy to prepare a resolution anent the retirement of Dr. Tassie.

The section then proceeded to the election of officers for the next year:—

It was moved by Mr. Strang, seconded by Mr. Reid, "That the

Executive Committee for the ensuing year be composed of Messrs. McHenry (Chairman), Fessenden (Secretary), McMurchy, Purslow, McGregor, and A. Millar (Walkerton); and that the Legislative Committee be composed of Messrs. Seath, Millar (St. Thomas), and Hunter. Carried.

Mr. Strang moved, and Mr. Robinson seconded, "That in the opinion of this section it is desirable that the course of study prescribed for the lower school should be revised so as to make it more flexible, especially in the case of girls, and to secure the payment of greater attention to the higher English branches." Carried.

Moved by Mr. Robinson, seconded by Mr. Hodgson, "That in the opinion of the High School section the amount of Latin and French prescribed for the Intermediate is too great, and that the programme should be amended by striking out *Cicero Pro Archia*, or some equivalent, and a portion of the French." Carried.

Moved by Mr. McMurchy, seconded by H. J. Strang, "That the cordial thanks of this section be conveyed to Dr. Tassie for the careful attention which he gave the interests of the High School section while he acted as their representative on the Senate, and that they desire to express their regret at his withdrawal from a profession in which he laboured so long and successfully." Carried.

We hope that the resolution referring to the course of study for girls may receive due attention from the Minister, as it seems to be the uniform opinion of head-masters that it is practically impossible to bring to the passing point in mathematics many girls who stand high in all other departments of their work. The teachers desire, we believe, that after they have reached a fair standard in this group, they be allowed to substitute an equivalent (for the balance of mathematics) in additional French, German, or English. For those not aiming at teaching, *i.e.* for the Intermediate *per se*,—this is quite practicable, and we trust may be brought about ere another examination takes place.

The head masters seem to think that the Latin group is at present rather heavy, and have suggested that the work be lightened. The same request is made regarding the French. As far as the Latin is concerned, since classes in all the authors prescribed for 1881-2 must be formed for students preparing for either of our Universities, we can see no good reason for dropping any one of these representative authors, with whose style every boy reading Latin ought to be early familiarized. Doubtless the minister will give the various recommendations of this section that consideration which they deserve, especially as on nearly all the subjects discussed he has requested an expression of opinion.

[The work of the other Sections will be analyzed next month.]

—It gives us much pleasure to record the success of a teacher who, by diligent study and a faithful performance of his duty, has won a higher position in the profession. Mr. W. F. Rittenhouse, of St. Catharines Central School, improved the small portion of time not occupied in teaching by qualifying himself for a higher certificate than the one he lately held. This, together with a recognition of his indefatigable labours in the school-room, won the approbation of the Board, who have promoted him to the head mastership of the school in which he so faithfully performed his duty as assistant. From our knowledge of Mr. Rittenhouse we can safely predict equal success and satisfaction in the more onerous and responsible position he now fills.

—We regret extremely to hear of the illness of Mr. P. Switzer, P. S. Inspector of the Algoma and Parry Sound District, and one of the most indefatigable workers in the cause of education. Mr. Wm. Kidd, P. S. I., Kingston, is also reported ill, and unable to attend to his duties; and Mr. J. C. Gashan, H. S. I., has suffered much from illness. We sincerely hope that ere long we shall receive a favourable account of good progress made towards recovery, if not of complete convalescence, of these three gentlemen.

We reprint an interesting editorial item which was accidentally misplaced in our July number.

The authorities of the leading New England Colleges have undertaken and are maturing arrangements for uniform requisitions for admission, from which much advantage must accrue to the Colleges themselves, to the preparatory schools, and to the cause of Education as a whole. The movement was entered on with a good deal of hesitation, but has made unexpectedly rapid progress. In the Autumn of 1879, ten of the New England Colleges—Harvard, Yale, Brown, Dartmouth, Williams, Amherst, Wesleyan, Trinity, Tufts, and Boston University, agreed to the holding of four conferences of Examiners for the purpose of testing the practicability of agreement upon requisitions in the four departments of Greek, Latin, Mathematics and English. These conferences were held; the Greek examiners meeting at Cambridge, the Latin at New Haven, the Mathematical at Providence, and the English at Hartford.

In each conference the examiners arrived at results practically unanimous, and when the standards recommended by them respectively were submitted to the various Faculties, the decisions of the Faculties were favourable far beyond original anticipations. A majority of the Colleges have either modified the entrance requirements in accordance with the recommendations of the examiners, or have reached the decision to do so for the incoming year. Further conferences are provided for, and will, no doubt, result in the complete unification of standards of admission to a large majority of the leading Colleges of the American Union.

From an item in our Educational notes from Nova Scotia, our readers will see that a goodly degree of interest is still taken in that Province in the question of higher education, and particularly in that phase of it, known as University Consolidation. The various religious bodies possessing Colleges, or at least most of them, are moving through their recognized agencies to strengthen their respective institutions financially. These efforts are apparently directed in the main to endowments of a permanent character, and indicate a disposition natural under the circumstances, to turn to good account both the loss of governmental aid and the current agitation in favour of Consolidation. The result of these financial appeals will be awaited with interest as having a not remote or unimportant bearing on the question in hand. The general aim of the gentlemen who are promoting the Consolidation movement is clearly disclosed, and so indeed are the methods by which the public mind is to be affected, and the desired end realized. The agitation however, is criticized as vague and aimless, because no definite scheme of reconstruction and amalgamation has been propounded. The practical difficulties are confessedly serious. Probably it is felt that the precise necessity is to create a strong *sentiment* in favour of union, to which it is hop-

ed the obstacles of a practical nature will yield. The address of the Superintendent of Education to the Teachers of the Province assembled at Truro, contained some temperate allusions to this subject, recognizing the desire for Educational unity as a natural and worthy aspiration, and at the same time conceding their full strength to the feeling obstructing the gratification of this desire.

—The Bishop of Manchester struck a good key note for Canadian as well as English teachers, when he said recently, that,

“The 35,000 teachers now employed in the elementary schools, whether connected with any specific religious denomination or not, should count it not only their highest duty, but their chiefest honour and privilege, to teach to those committed to their charge a simple, reasonable and apostolic Christianity.”

There is no doubt that the future of a child, his capacity to benefit himself and his country depends more on the training of his moral nature than his mental powers. Teachers should teach morality systematically, not in set lessons, but by correct examples and just decisions, by always placing truth and honesty above mere smartness, by commending industry and perseverance rather than reliance upon genius, by making “duty” the motto of each pupil, and by embracing every fit occasion in school life for showing the good effects of virtue, and the evil results of wrong actions.

—Statistics are usually uninteresting, but some are valuable for reference. General Eaton, United States' Commissioner of Education, has issued a circular showing the comparative statistics of the principal countries of the world in regard to elementary education. The following refer to the countries having one million pupils or over:—

Countries.	Population.	Pupils.
1. United States.....	50,152,866	9,424,086
2. France.....	36,905,788	4,716,935
3. Prussia.....	25,742,404	4,007,776
4. England and Wales.....	25,165,336	3,710,883
5. Japan.....	34,245,323	2,162,962
6. Austria.....	21,752,000	2,134,683
7. Italy.....	20,801,000	1,931,617
8. Hungary.....	15,666,000	1,559,636
9. Spain.....	16,507,000	1,410,000
10. Russia.....	78,500,000	1,213,325
11. Ireland.....	5,411,416	1,031,995

It will be seen that America and Ireland have the largest ratio of pupils to population—about 1 to 5, while Russia shows the smallest ratio—about 1 to 65.

—We call special attention to the advertisement of Miss Lewis in our columns. This lady has lectured and given readings before the Toronto, the North Grey, and the Perth associations with the greatest success. The report of the last association stated that, “she gave an exemplification of the art of teaching Elocution, putting the members through a course of exercises as a practical illustration; and from a series of selections gave some admirable readings of conversational, oratorical, and dramatic pieces. She also introduced the phonic system of spelling. Miss Lewis's language in describing the several phases of her subject was particularly well selected and to the point. The rounds of applause which greeted the con-

clusion of each exercise, and the strict attention manifested, indicated the deep interest the members took in the instruction." "Miss Lewis's exercises in elocution at the Convention led the teachers to expect special pleasure from her Readings, given on Friday night, in the Town Hall of Stratford, an anticipation which was in no way disappointed, for after her sixth appearance during the evening the crowded audience found themselves in a frame of mind similar to that in which 'Oliver Twist' found himself—they wanted more." Miss Lewis gave her lecture and Readings before the North Grey Association with equal satisfaction and success, and in Toronto and various parts of the Province, her Recitations and Readings have excited the greatest interest. We may add also in connection with this young lady's high qualifications that she is the daughter of Mr. Richard Lewis, the well known elocutionist.

Mathematical Department.

SOLUTIONS TO INTERMEDIATE EXAMINATION PAPERS, JULY, 1881.

ARITHMETIC.

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 (b) L. C. M. of $4\frac{1}{2}$, 5, $2\frac{1}{3}$, and $3\frac{1}{2}$ = 3456 inches, the side of the square.
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3. (a) Ans. 173444.
 (b) Ans. 5 dys., 21 hrs., 11 min., 53 $\frac{1}{3}$ sec.
4. See Hamblin Smith's Arith., Can. Ed., p. 250.
 Litre = 1 cub. decimetre = $\frac{1}{1000}$ cub. metre.
 1 pt. = $2\frac{1}{4}$ = 34.625 cub. in.
 \therefore 1 litre = 1.76077×34.625 cub. in.
 1 metre = $10 \times \sqrt[3]{1.76077 \times 34.625} = 39.37$ inches.
5. No. dys. = $\frac{6 \times 5 \times 9 \times 3}{7 \times 5 \times 16} = 1\frac{1}{4}$ dys. — Ans.
6. No. men = $\frac{3 \times 40 \times 2000 \times 2000 \times 1000}{12 \times 20 \times 1600 \times 1600} = 1562\frac{1}{2}$ men.
7. In 15 min. true time, the min. hand will pass over $\frac{1}{6}$ of 15 min. spaces = $13\frac{1}{2}$ spaces.
 In 15 min. true time the hour hand will pass $\frac{1}{4}$ of $\frac{1}{2}$ min. spaces on the face = $1\frac{1}{8}$ spaces.
 Distance apart at time of observation = $13\frac{1}{2} - 1\frac{1}{8} = 12\frac{3}{8}$ spaces.
8. \$3700 yields \$270 int. Rate = $7\frac{1}{4}\%$. — Ans.
9. The company gets 8% compound int. for its money.
 \therefore Sum $(1.08)^2 = 70(1.08) + 70 + 1000$.
 Sum = $\frac{1145.60}{1.08 \times 1.08} = 9982.17$. — Ans.
 See H. Smith's Arith., Can. Ed., p. 343.

ALGEBRA.

1. (a) $x^2 + y^2 = (x+y)(x^2 - xy + y^2)$.
 (b) $x^3 + y^3 + z^3 - 3xyz = (x^2 + y^2 + z^2 + 3xy(x+y) - 3xy(x+y) + z^3 - 3xyz) = \{(x+y)^2 + z^2\} - 3xy(x+y+z) = (x+y+z)\{(x+y)^2 - (x+y)z - z^2 - 3xy\} = (x+y+z)(x^2 + y^2 + z^2 - xy - yz - zx)$.
- (1) For $x+z$ write m , for $y-z$ write n and the expression assumes the form
 $m^2 + n^2 - (m+n)(m-n)^2 = (m+n)m$
 divide through by $m+n$, using (a)
 $(m^2 - mn + n^2) - (m-n)^2 = mn$, which is an identity on expansion.

- (2) Left hand member
 $= (a^2 - bc)^2 - (a^2 - bc)(b^2 - ac)(c^2 - ab)$
 $+ (b^2 - ac)^2 - (b^2 - ac)(c^2 - ab)(a^2 - bc)$
 $+ (c^2 - ab)^2 - (c^2 - ab)(a^2 - bc)(b^2 - ac)$.
 Factoring each member this is
 $= (a^2 - bc)\{(a^2 - bc)^2 - (b^2 - ac)(c^2 - ab)\}$
 $+ (b^2 - ac)\{(b^2 - ac)^2 - (a^2 - bc)(c^2 - ab)\}$
 $+ (c^2 - ab)\{(c^2 - ab)^2 - (a^2 - bc)(b^2 - ac)\}$.
 Simplifying the large brackets
 $= a(a^2 - bc)(a^2 + b^2 + c^2 - 3abc)$
 $+ b(b^2 - ac)(a^2 + b^2 + c^2 - 3abc)$
 $+ c(c^2 - ab)(a^2 + b^2 + c^2 - 3abc)$.
 Multiplying out a, b and c and adding up
 $= (a^3 + b^3 + c^3 - 3abc)(a^2 + b^2 + c^2 - 3abc)$
 $= (a^3 + b^3 + c^3 - 3abc)^2$.
 See McLellan's Alg., page 37.
 Todhunter's Alg., page 143.

2. The given relation transposed is
 $(a^2 - b^2) + c(a - b) = 0$, or
 $(a - b)(a + b + c) = 0$. Now one at least of the factors must = 0, but $a - b$ is not = 0 since a and b are unequal.
 $\therefore a + b + c = 0$
 i.e. $(a + b + c)(ab + bc + ca) = 0$, which is the required expression factored.
3. Since the L. C. M. is of only four dimensions, while their product is of six dimensions, the G. O. M. must be of two dimensions. Let it be $x^2 + mx + k$. Divide each of the two given quantities by $x^2 + mx + k$ and put the rems. separately = 0, and we get:
 $-k = m(a - m)$ and $b = k(a - m)$;
 also $-m = c - k$ and $d = -mk$.

- Now eliminate m and k .
 $k = \frac{b-d}{a}$ and $m = \frac{b-d-ac}{a}$.
 Hence $-\frac{b-d}{a} = \left(\frac{b-d-ac}{a}\right)\left(\frac{a-b-d-ac}{a}\right)$.
 i. e. $a(d-b) = (b-d-ac)(a^2 - b + d + ac)$.
4. Sum = $\frac{x^2(x^2 - y^2) + x^2(y^2 - z^2) + y^2(z^2 - x^2)}{(x-y)(y-z)(z-x)}$
 $= \frac{(x-y)(y-z)(z-x)(-xy - yz - zx)}{(x-y)(y-z)(z-x)}$
 $= -(xy + yz + zx)$.
 5. (1) Given expression:
 $= 2 \times \frac{2bc - b^2 - c^2 + a^2}{2bc} \times \frac{2ca - c^2 - a^2 + b^2}{2ca} \times \frac{2ab - a^2 - b^2 + c^2}{2ab}$
 $= \frac{1}{4a^2b^2c^2} \{a^2 - (b-c)^2\} \{b^2 - (c-a)^2\} \{c^2 - (a-b)^2\}$,
 $= \frac{1}{4a^2b^2c^2} (a+b-c)^2(a-b+c)^2(b+c-a)^2$, of which the sq. rt. is
 $\frac{1}{2abc}(a+b-c)(a-b+c)(b+c-a)$.

- (2) Sq. rt. = $x^2 + \frac{1}{2}x + \frac{1}{2}$, by inspection.
6. "Every equation of the n th. degree has n roots and only n ." The given expression contains x only to the first degree. Hence if it admits of more than one value for x it must be an identity, not an = n . But the expr. vanishes when $x+a=0$, or $x+b=0$, or $x+c=0$. Hence $x = -a, -b, -c$, and the expr. is an identity. See H. Smith's Alg. p. 57.

7. $\frac{(b+c)(b-c)}{k-a} + \frac{(c+a)(c-a)}{k-b} + \frac{(a+b)(a-b)}{k-c}$.
 Observe that the sum of $(b-c), (c-a), (a-b) = 0$. Thus the expr. would vanish if the remaining part of each fraction disappeared.
 This would happen if $b+c=k-a$,
 $c+a=k-b$,
 $a+b=k-c$.

- And we see that these three relations hold when $k = a + b + c$.
8. Let $3x = A$'s income.
 $12y =$ " expenditure.
 $\therefore 3x - 12y =$ " saving.
 Then from conditions given,
 $2x = B$'s income,
 $y =$ " expenditure.
 $\therefore 2x - y =$ " saving.
 Now their savings are as 4:5,
 $\therefore 5(3x - 12y) = 4(2x - y)$,

$\therefore x=8y$,
or $3x=24y=\Delta$'s income.
But he spends 12y, hence saves half his income.

9. (1) $x=\frac{3}{2}$.

(2) Transpose, and add each side thus :

$$\frac{1}{x-a} + \frac{1}{x-4a} = \frac{1}{x-3a} + \frac{1}{x-2a}$$

$$\frac{2x-5a}{(x-a)(x-4a)} = \frac{2x-5a}{(x-3a)(x-2a)}$$

$$\therefore 2x-5a=0 \text{ or } x=\frac{5a}{2}$$

This equation becomes an identity when $a=0$, which also satisfies the quotient remaining after the last division.

(3) Complete the divisions, cancel quotients, transpose remainders, and add the left hand, thus :

$$\frac{x+1}{x^2+x+1} - \frac{1}{x-1} = \frac{1}{x^2-1}$$

$$\frac{x^2-1-x^2-x-1}{x^2-1} = \frac{1}{x^2-1}$$

$$\therefore -x-2=1,$$

$$x=-3$$

(4) Add the equations.

$$(x+y)^2 + (x+y) = 56$$

$$\therefore x+y=7, \text{ or } -8.$$

From 1st equation

$$x(x+y) + y = 25$$

Substitute $7x+y=25$,

Or $-8x+y=25$.

Combine these respectively with

$$x+y=7, \text{ or } -8,$$

And we get

$$x=3, \text{ or } -\frac{1}{3},$$

$$y=4, \text{ or } -\frac{1}{3}.$$

NATURAL PHILOSOPHY.

1. If a point were left wholly to itself it would either continue at rest or it would move uniformly in a straight line. Any cause which changes or tends to change either of these states is a *force*.—*Twisden*.

It is found that on all bodies on the earth a pressure is exerted downwards, in a vertical direction, and this pressure, which is called the *weight* of the body, is invariable at the same place for the same body at all times, whatever form, size or position the body may be made to take.—*Cherriman*.

In order to conceive the existence of a force, we must conceive that there is something upon which it can act, and which may be called matter.—*Kirkland*.

The word *mass* is used as an abbreviation for "quantity of matter."—*Todhunter*.

Mass is estimated by its weight, the weight of one pound of matter in London at the sea-level being assumed as the unit. Forces are measured by comparison with the standard pound or gravitation unit.

The force of gravitation is different at different places. If the standard pound were weighed in a *spring balance* at a place near the equator, it would be found to be about 22 grains lighter than if similarly weighed in London.—*Twisden*.

Perhaps the most delicate of all instruments for the measurement of force is the *Pendulum*. The square of the number of small oscillations in a given time is proportional to the magnitude of the force under which these oscillations take place. For the estimation of the relative amounts of gravity at different places this is by far the most perfect instrument.—*Thompson and Tait*.

2. Book-work.

$R^2 = P^2 + Q^2 + 2PQ \cos. \alpha$, where R is the resultant, P and Q the components, and α the angle between them. See H. Smith's *Statics*, p. 24. Hence if P and Q are constant, R will increase when $\cos. \alpha$ increases, and decrease when $\cos. \alpha$ decreases. But $\cos. \alpha$ decreases from 1 to -1 as the angle increases from 0° to 180° . Thus R decreases as the angle increases.

Geometrically we have to show that of all parallelograms having equal adjacent sides, that which has the smallest angle between these sides has the greatest diagonal, and that which has the greatest angle has the least diagonal.

It is easily shown that when the forces are equal, equal increments will not affect the direction of the resultant. If they are unequal

equal increments will bring the resultant nearer the smaller force, but proportional increments will not change its direction.

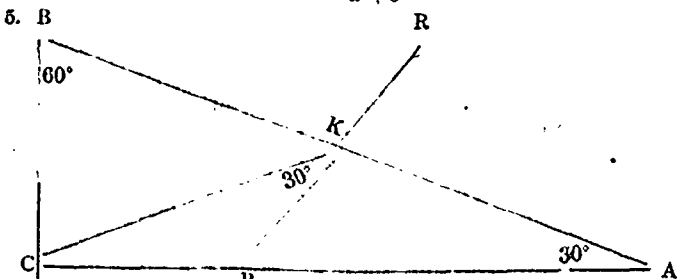
3. Let ABCD be the square. Place 10lbs. at A, 20 at B, 30 at C, and 40 at D. Take BE one-third of AB, and OF four-sevenths of CD. Join EF, and take GF three-tenths of EF. F is the point required. The proof is obvious.

4. See Kirkland's *Statics*, p. 93.

The loss is $\frac{W(a-a')^2}{ab}$ where W is the weight put into the scale

pan. And the true weight of the goods sold is $W\left(\frac{b}{a} + \frac{a}{b}\right)$.

Hence the required fraction is $= \frac{(a-b)^2}{a^2+b^2}$ of the true weight.



Let K be the middle point of AB. Produce the reaction back to meet BC produced at D. The sides of the triangle KCD taken in order represent the forces. Now BOK is equilateral, for BK is equal to BC, and KBC=60°. It follows that CKD=CDK=30°, i. e., CK=CD, or tension = weight = 12lbs.

D
R, the reaction, is the resultant of the weight and the tension acting at 60°, and each=12 lbs. Hence R=12√3.

If P be the point where KD cuts CA, then the string may be fastened anywhere between C and P.

(Remainder next month.)

Correspondence.

To the Editor of the CANADA SCHOOL JOURNAL.

SIR.—A few weeks ago the "City of Toronto" returned to her wharf from Niagara, and whilst wheeling wood on deck one of her hands fell overboard and in a few moments was rescued. He lay untouched, and uncared for; and when a student very properly attempted to resuscitate him, he not only received no aid from the officers or crew of the vessel, but was taken by the shoulder and asked to step aside. The unfortunate sailor was wrapped in canvas and sent to the morgue.

This is the old, old story. People are willing to put forth Herculean efforts to rescue persons from water, and when rescued, although (in many cases) not dead, the bystanders know not what to do. With the hope that, perhaps, some of the many teachers who peruse your journal might be anxious to give to their pupils a knowledge of some method of resuscitation, I venture to aid them with the following rules. I have adopted the Sylvester method (with some additional points from others), because it is the system used in Great Britain, and in some continental countries, and because I think it is the best. In preparing the subjoined rules I have avoided all technicalities in order that the language may be readily comprehended. I have also added to each rule its *rationale*, for I think a rule is much more easily remembered if the reason for its use is understood.

Faithfully yours,
J. W. McLAUGHLIN.

APPARENTLY DROWNED, BUT NOT DEAD.

By J. W. McLAUGHLIN, M.D., M.P.P.

A man falls into water, struggles for a few moments, and sinks. Strenuous efforts are made for his recovery, and finally the body is laid on the deck or shore. It is cold. The face is pale. The eyelids are livid, swollen and partly open. The pupil, or dark spot in the centre of the coloured part of the eye, is very large. Froth oozes from the mouth and nostrils. The chest is still; he does not breathe. A hand is placed over the heart just below the left breast; its beat is unfelt. Purple blotches are scattered here and there over the body and limbs.

With all these symptoms, so indicative of death, can that chest be made to rise and fall in the act of breathing again? Can anything be done that the heart-beat may be perceived once more? Is it possible that life can be restored to those who are apparently drowned?

These questions the following rules are intended to answer; and if faithfully and intelligently enforced, reasonable hope of successful restoration to life may be entertained in many cases.



RULE 1.—Loosen everything around the neck, turn the patient's face downward, raise the body several inches higher than the head, and retain it in this position long enough to count four slowly. This movement will enable the froth and water to escape from the throat, mouth and nostrils, so that air may have free access to the lungs as soon as breathing commences.

RULE 2.—Place the patient on his back, with the chest slightly elevated by a folded coat or other suitable object, and the head in a straight line with the body. This position is necessary for the practice of artificial breathing, described in Rule 4.

RULE 3.—Immediately below the root or back part of the tongue is the entrance of the air tube leading to the lungs. This entrance is guarded by a small valve, which is closed when the tongue falls far back into the throat, and opened when it is drawn forward. Hence the third Rule:—Draw the tongue forward, and retain it in this position. This organ being covered with the mucus of the mouth, is very slippery and cannot be easily held by the naked hand. This difficulty is readily overcome, however, by placing a cotton rag or handkerchief between it and the fingers.



RULE 4.—Practice artificial breathing. This can only be accomplished by imitating the natural movements of the chest. In order that air may enter the lungs, the chest cavity must be enlarged, and in order that it may be expelled, the chest cavity must be diminished. Nature accomplishes these ends through the action of certain muscles which surround the chest. By art the same results may be effected, although not so perfectly, as follows:—The operator stands astride the patient's hips, grasps the arms at the elbows, and raises them above the head, until they nearly meet. This movement expands the chest, and air enters the lungs.



Next he brings the arms down by the side, and with both hands on the lower part of the chest and stomach, makes, by a quick motion, firm pressure towards the patient's back. This act diminishes the chest cavity, and consequently forces the air out of the lungs. This double movement is to be regularly repeated from twelve to fifteen times a minute.

RULE 5.—Without interfering with artificial respiration remove all cold, wet clothing, and restore warmth to the body. Importance must be attached to this rule and the greatest possible haste exercised in carrying it out, especially if the body has been long in the water. If practicable, while the body is being rescued from the water, make preparations for the application of heat, either by hot blankets, hot water, hot air, hot bottles, hot sand, hot salt, or any other method which the exigencies and circumstances of the case may suggest. Should it be necessary to convey the patient some distance, in order to secure the best facilities for the restoration of breathing and warmth, the body should first be well wrapped in dry, warm clothing—the bystanders, if necessary, sharing their garments for the purpose.

RULE 6.—Rub the whole body vigorously with the hand or with ho flannel. This process adds heat to the system and aids in promoting respiration.

RULE 7.—Persevere. Be not discouraged by hours of apparently unsuccessful toil. Life may yet be saved.

RULE 8.—Avoid all confusion, but hasten, hasten! Every moment which passes unimproved is lost, and the hope of restoration dimmed, therefore hasten!

Remember that although these rules are placed in a certain consecutive order, it is not intended that this particular order must be strictly followed in every case. Indeed, all the various processes require as far as possible to be commenced and carried on simultaneously. And the labour should be divided among reliable hands. One attends to the tongue; one to the artificial respiration; two or three to the friction of the body, several to the supply of warmth.

RULE 9.—Should the effort be crowned with success, place the patient in a warm bed, surrounded with plenty of fresh air, and as soon as he can swallow, give him hot milk, tea, or coffee. Under no circumstances whatever, allow any fluids to be administered, unless the patient can easily and certainly swallow.

Contributions.

PHYSICAL EDUCATION.

BY A. H. MORRISON, GALT.

(Read before the Ontario Teachers' Association at Toronto.)

With regard to physical training, I think I am safe in saying that in our public schools, especially those in country districts, there exists a great necessity for the introduction of some definitely planned and well conducted system for corporeal development and muscular exercise in a certain direction—I say a certain direction, for mere bodily vigour, concentrated brute force, can be obtained irrespective of true physical culture, in a variety of ways; at the blacksmith's anvil, between the plough handles, swinging the woodman's axe, &c. Physical culture has for its aim, higher developments; strength and vigour unquestionably, but trained strength and systematized vigour; enduring hardihood certainly, but organized and educated hardihood; muscular development and physical prowess indubitably, but musculo companioned by grace, and prowess associated with dignity of comportment and elegance of motion. A sledge-hammer, though a powerful and a dangerous weapon, is but a blundering and plebeian instrument with which to perform the exploits of a hero on the battle field. The keen and polished rapier made of tempered steel, which will bend double at a twist of the wrist, has yet strength sufficient to accomplish the same end with infinitely less labour and with far better grace. What are we to understand by physical education? Why, the training of the body irrespective of the mind by certain well-fashioned laws of exercise. Exercise which indulged in tends to promote corporeal growth, to strengthen and develop nerve and muscle, to expand the lung system, to inure the body to hardships under which an unseasoned or debilitated frame would succumb, to fortify it so as to enable it to resist the insidious attacks of disease, to make it, in short, a fit tabernacle for the reception of a strong and useful intelligence, capable of permitting the full exercise of that intelligence, without endangering bodily health or mental acumen, able to defend itself in case of need from exterior inimical influences, and while accomplishing these objects, to acquire simultaneously grace, ease, dignity, to the end that a healthy human form may be rendered the fit associate of a healthy human mind.

I am hardly yet prepared to say whether I do or do not advocate the Darwinian theory. "There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy." I, in common with most of my countrymen, confess to prejudices of ancestry, I am ready and willing at any moment to believe that my paternal ancestor, in the long ago, was John of England, who was a murderer, a liar, a craven, and a renegade, or that I am maternally related to Boadicea, who was doubtless a half nude, wholly uncivilized, vindictive Amazon. Even Bloody Mary, the most despicable woman who ever assumed the English crown, would look well as an eighteen hundred and eighty-first cousin. I am not so certain whether a paternal gorilla or a maternal chimpanzee, however guiltless of treason, bigotry or blood-thirstiness, would fit the earl's chair of ancestry as well. But, joking aside, I am prepared to admit this at all hazards, that the orang-outang is the natural effect for natural cause. That the orang-outang is at best but a poor mathematician, natural, too, you will say. That the merest tyro of an orang-outang as an athlete would knock our doughtiest gymnast—if I may be allowed the expression—into a cocked-hat, and this, I presume, is natural also. I never heard of an orang-outang—unless in confinement—suffering from gout, indigestion or the blues, natural again, altogether natural; nature there is evidently the true mother, the true nurse, the true first

preceptress, ergo, we should obey the teachings of nature and follow, physically, the example of the orang-outang; spend much time in the open air; take a large amount of exhilarating out-door exercise, run, leap, swing, climb, live temperately; religiously,—abjure strange gods, and the worship of individuals in crowds; socially,—renounce class prejudices and back-biting one's neighbours; morally—abolish whiskey stills and their associated evils; intellectually—reject competitive examinations as tests of scholarship and too much mathematics as an intellectual cultus, and go a step farther, wear a remnant besides our own hair. Pay school teachers decent salaries, and study the humanities but not to the perversion of our own intellect or the deterioration of our muscular system; of such folly even an orang-outang would be guiltless.

I must say I am an advocate for muscular christianity. I may add I am no admirer of an awkward, shambling gait. I have been lately led to ponder upon this subject of gait by the strange opinions which, during a residence of three or more years in the country districts of Canada, I have heard time and again formulated by country residents. There seems to be an idea prevalent that a perfectly upright, free, confident carriage, is inseparable from pride and self-conceit. This is no mere fancy, the sentiment has found expression in words over and over again in my hearing. Conversing one day with an old resident, our conversation happened to turn upon a young man of my acquaintance, a farmer's son, who had received a tolerable education, and who was by far the smartest looking young man about those parts. "Ah," said my companion, "he is too big for his cloth, he walks as if he owned the whole world." The stricture was a most unfair one.

I have not known whether to be more amused or angry at such utterances, promptings of an ignoble or perverted taste. I suppose it has become so much the fashion in country districts for youth to struggle from the cradle to the grave with "lack-lustre eye," and hand in "poke" that anything in the shape of an erect posture, swinging gait, and independent front, is looked upon as an abnormal and offensive state of being, a metaphorical challenge to personal combat or an unspoken assertion of physical superiority, and this because one presumes to lift his eye above the level of the rut and prefers to swing his arms in the glorious day light rather than bury one-half of them in the cavernous recesses of his breeches pockets. Now, I would ask, is an erect carriage a fault that it should be thus censoriously criticised by any section of a civilized community? In the beginning God made man, and he made him a little lower than the angels. He made also the beasts of the field. But observe the difference. He placed man erect, firm, planted in such a position that without effort or diminution of grace he could lift his god-like front and scan the heavens, the wide-spread epitome of all that is loftiest and most wonderful in the created universe, but the beast grovelling on all fours progresses ever with face to earth, its present home, and type of its grosser and irrational nature. Let me here put a leading question. Is an upright, dignified carriage consistent with healthy action, is it a thing to be desired in itself as a mere means of locomotion? With regard to the first point I unhesitatingly answer that there can be no really healthy action, no physical perfection without erect, free, open-shouldered carriage; and as to the second point I think it very much better to progress through life as though unburdened with any particular heavy load of conscience, than to grope from infancy to dotage in a position which might lead the uninitiated to suppose we were staggering under plathoric sacks of individual iniquities committed in the flesh weighing us to earth, or in the anticipations of our particular friends possibly still lower. I do not think I am using a too severe form of expression when I denounce the carriage of the majority of our country school-going

youth as slouching, and this careless, awkward, inelegant gait is obviously the result of a want of proper physical training. Where will you find a firmer tread or better port than in the ranks of the British army? As a stranger and an American has well said, "the British soldier has the swing of conquest," he should have said rather, he appears to have the swing of conquest, but it is in reality the swing of the parade ground and the drill shed. Yet from what class are the ranks of the British army largely recruited? Why, from the very class we have now under consideration, young men engaged in rural pursuits, whose gait, as I have had ample means of witnessing, is at least as clumsy and heavy as is that of the occupants of Canadian farm lands. A few months or years under the drill instructor, converts the green, shambling, ungraceful rustic into the trim, erect, alert warrior. A wonderful metamorphosis truly, and one which would have been still more thorough had the change been effected in earlier youth. I maintain that the erect position is the normal position of man; when the body is upright, the shoulders well back, the head erect, there is more room for the lungs to perform their office, the limbs fall more naturally into position, the vital functions of every member are more regularly performed, and this erect, easy, graceful and withal natural and healthy position can be acquired by training or can be lost for want of proper culture. I deem that in one sense at least men, with few exceptions, are born equal, with like physical instincts, with like corporeal parts, which can be educated and perfected. Why then do we see one man—say at the age of twenty-five—walking like a hero of romance and another at the same age slouching like a Californian hoodlum. Because, probably one has paid more attention to physical development, or has at least not been influenced by agencies antagonistic to such, the other has neglected physical culture or has had to follow a vocation inimical to healthy physical development. It has been a recognized axiom with all great thinkers, for many centuries, that bodily training should go on concurrently with mental exercise. Montaigne, a celebrated French moral philosopher who lived in the sixteenth century, was a strong advocate of physical culture. He says: "We have not to train up a soul nor yet a body but a man, and we cannot divide him." Locke, again, the author of the *Essay on the Understanding*, advises plenty of out door exercise, with plain food, and condemns the practice of straight lacing and tight clothing. Pestalozzi and Froebel the great fountain heads of popular education combined, as you all know, intellectual culture with physical exercise in their methods of tuition; and Rousseau, in his treatise on education, says: "Nature has destined us for the offices of human life, antecedently to our destinations concerning society. To live is the profession I would teach him (alluding to a youth). Let him first be a man; he will, on occasions, as soon become anything else that a man ought to be, as any person whatever. Fortune may remove him from one place to another as she pleases; he will always be found in his place." It has thus become a recognized principle in all modern educational systems that no course of instruction can be regarded as thorough unless it includes some provisions for the exercise of the physical energies, as well as means for the development of the mental faculties. Granted, then, that physical training of some sort is an absolute necessity in our school curriculum, that the body must be developed concurrently with the mind. How shall we best effect this object?

In the consideration of Physical Education, taken in connexion with our Public School System, there are four phases of the subject which should come under discussion:—

- 1st. Position in school, sitting or standing.
- 2nd. Change of position in the school-room.
- 3rd. Systematic out-door exercise—gymnastics.
- 4th. Systematic out-door exercise—drill.

In thus dealing with the subject I pre-suppose suitable school accommodation, adequate ventilation, and every necessary appliance for at least personal comfort and healthful in-door action. I also take it for granted that when speaking of physical culture, all these influences are included in the term which combine to produce a healthy, vigorous frame with an active, graceful deportment. Assuming this much we may be readily enough led to apprehend that there are two phases of physical education, an indirect and a direct one: under the first aspect I propose to discuss Nos. 1 and 2 of my afore-named subdivisions, and under the latter, Nos. 3 and 4. But first I would like to define the term indirect physical education. It is simply this:—That positional training, which, without being *special*, is or should be conducted at all times concurrently with whatever other *special* subject of instruction may be the theme of discussion. It relates chiefly to attitude and personal demeanour in the classroom; position, in fact, when the body is absolutely quiescent, or when motion is limited to the simplest movements, made involuntarily for mere change of posture, or under the direction of the teacher for purposes of class recitation. What can be more painful to the senses of a disciplinarian upon entering a school-room, than to see one scholar sprawling over his desk like a gigantic human frog, and another huddled into a heterogeneous mass of flesh and small clothes, not unlike a sitting anthropomorphous hen. A third with legs extended or doubled under him, as the case may be, hands in the inevitable pockets, head sunk low between elevated shoulders, hair standing erect like quills upon the fretful porcupine, is contemplating with a malignant frown or a harmless stare of innocent vacuity three-eighths of a Third Reader or four-fifteenth of an authorized mis-spelling book. A fourth again with elbows on desk and head buried between hands, whose complexion eloquently though tacitly establishes the truth of at least one inspiration of Holy Writ,—“dust thou art, and to dust shalt thou return,”—or to mud pies, is evidently seeking to imbibe the rudiments of knowledge as the celebrated character in Dicken's "No Thoroughfare" imbibed moisture, through his pores, situated in this case at the extremities of those necessary and often denuded joints which now make dimples in the soiled and dog-eared page before him. Let us turn to a writing lesson. How often do we see our pupils with elevated shoulders, contorted nether limbs, crooked fingers and mouths to match, eyes close to book, painfully attempting to delineate characters which they find it impossible to form aright from the very perversity of their positions? But setting the possibility of correct penmanship aside, how injurious to health must these unnatural and inelegant positions be, what habits of laziness do they engender, and of what physical evils may they not be productive,—round shoulders, weak chests, defective vision. In standing classes the same evils in varied forms may be noticed. Here we have one ambitious youth striving might and main to emulate the grace and dignity of deportment of that amiable, if unpretentious, barn-yard fowl, whose cackling, we are told, once saved the Capitol, by balancing himself on one leg. There, a girl too enamoured with her sitting place to part with it entirely clutches the cross-bar with a fond desperation, or leans with insouciant ease against the side of the desk without whose friendly aid she would certainly sink enervate and prone to mother earth. So many men so many minds, seems here to be travestied, and so many pupils so many positions is the experimental apothegm of the hour. All this is wrong and demands remedying. I think it not too much to say that something of true physical culture can be communicated at the desk or in the recitation class. Scholars should be compelled to sit naturally, gracefully and easily, and to stand erect, heels together, toes out, shoulders back and head up; such training is but a preliminary step to the gymnasium or the drill ground.

Secondly: it is the fashion, in many graded schools, to permit scholars in the advanced classes to occupy their seats without change of position, save that incidental to purely mechanical desk movement, from the time they enter the class-room till the hour arrives for them to disperse for recess, or for dismissal. Does not this fashion of itself encourage in youth an idle, slovenly, often listless and sleepy habit? Speaking for myself, I feel it burdensome to sit in the same position for two hours together. I believe many of my professional brethren—voluntary students—will have experienced the same restless longing for a stretch and walk round after an hour or two's intense application to study. What then must it be for youth, lively, mercurial, energetic youth, to be thus cribbed and doomed to *durance vile*? They write sitting, they read sitting, arithmetic still sitting, geography, history, etc., all sitting exercises. I think that even with our most advanced classes such a course of sedentary discipline is hardly judicious. Change is a law of nature,

an imperative necessity with young nature, half of the school-room languor, ill-performed recitations, covert mischief, etc., more especially in sultry summer weather, is directly traceable to the inert and positively hurtful custom of planting our scholars like celery in trenches and dropping upon their devoted heads, loads, not certainly of earth, but of foul air, and leaving them to vegetate, and bleach, and assimilate all indigestible elements, without once stirring their inactive forms with the hoe of reason, or refreshing their stultified intellects with an enlivening douché from the can of common sense. I really think that movement, regulated, systematic, unostentatious movement, should be a feature of class routine from the lowest to the highest grades. Change of position, especially in warm weather, is essential to continual effort, healthy tuition, and alert open-eyed application. So much then for indirect physical culture, or the physical culture of the school-room, let us in the next place proceed to consider what means are to be adopted directly in furtherance of the same object.

(To be continued).

THE TONIC SOL-FA SYSTEM OF SINGING.

BY J. L. ROBERTSON, TORONTO.

The admirable introduction given to this subject in the brief article contributed by Professor T. F. Seward in the July number of the JOURNAL, has led those who are interested in it to desire a further insight into a system which has proved so popular, useful and easily acquired. As an experienced teacher of the system I can testify to the facts stated by the Professor; and as one of a choir subjected to a similar sight-singing test as that described in his article, can also certify to the value of the notation in that respect.

As a rule "popular" methods do not meet with cordial reception at British hands. The barriers which grow up around high art, and are defended with jealous care, must not be thrown down by iconoclasts who would admit the plebeian to the shrine where only the privileged few are permitted to worship; and a "royal" road to the cultivation of musical taste, and the enjoyment of a popular appetite for music was not to be thought of. Musical training was to be paid for smartly, and audiences and congregations should be content to listen and admire, but not to overstep the sacred boundary which fenced around the divinity. Such was the atmosphere in which the Tonic Sol-fa System was born, and it breathed the same for some years, but the indomitable perseverance of its projectors—among whom the Rev. John Curwen, of Plaistow, was the principal—sustained it until it grew strong enough to bear the chills of prejudice and contempt; and now it has attained a vigour which is beyond being influenced for evil. The winning charms of the method also have had such an effect on the public mind, that after over thirty years' trial, it has become an acknowledged national institution, has a well supported training college, and is endorsed by many of the leading musical celebrities of the day. In about two-thirds of the schools of Great Britain the system is taught, and in the majority of instances the members of the best choirs are Tonic Sol-faists. Mr. Curwen mentions the following as evidence of its influence:—"The music instructor to the London School Board, (England), on visiting the 120 schools under his direction, told the teachers that they were free to use what system they liked. He reports that 'all preferred the Tonic Sol-fa system.'"

"At the National Music Meetings of 1873, three out of the four prizes for mixed choirs were taken by Tonic Sol-fa societies. At the meeting of 1872 a Tonic Sol-fa choir won the only contested choral prize."

"The system is introduced by missionaries in all parts of the globe. It has been introduced in Madagascar, Cape Colony (for the Kafirs and the Dutch), Hong Kong, Beyrout, Mount Lebanon, Fiji, South Africa, Bombay, Calcutta, Barbadoes, St. Helena, Nor-

folk Island, Spain, Japan, Burmah, Chili, &c., &c."

(See circular issued by Prof. Theo. F. Seward, Orange, N.J.)

It is not my intention to give a detailed history of the New Notation, as it is called, nor to write a complete series of lessons on the subject, but merely to enlist the sympathies of teachers on behalf of a system which proves itself to be all that is claimed for it; and to show that teachers do not need to be accomplished musicians to teach the rudiments of vocal music to the children of our schools.

Canadians are a music loving people. Many of the societies have well-trained instrumental bands, few respectable houses are without a piano forte or organ, if the proprietor can afford it, and nearly everyone possesses a singing voice, which is capable of being trained to much advantage. I am, therefore, led to think that in Canada a method of singing at sight which promises to help those who are desirous of attaining proficiency in a pleasing art, will be received with satisfaction, and be productive of good results in training the young. Teachers, especially, will find the work of imparting the knowledge of singing so easy and enjoyable that it will be their own fault if, by its means, school is not made more pleasant, the children more anxious to attend, and the drill movements more attractive.

The wonderful influence of music has been felt throughout all ages. Shakespeare says:

"Music oft hath such a charm
To make bad good," &c.

and viewing it in this light, it should be considered as a powerful agent in the work of education. The higher feelings are brought out by its power, and a child's better nature developed; the morality inculcated by the right sort of school songs is of the most lasting description; the tendency to counteract the evil effects of slang tunes, and senseless—often worse—diction, is of the greatest importance; while the refinement engendered by the cultivation of an art which

"Hath charms to soothe the savage breast,
To soften rocks, or bend a knotted oak,"

is apt to pervade the future life of the pupil, and make him an ornament to society and an elevator of the human race.

In the family vocal music commences with the lullaby: in society it is highly appreciated; in the place of worship almost indispensable; then why should it not be in the school-room, where the elements of all that is useful and accomplishing ought to be taught? Educationists agree that it should appear on the programme of school work; physicians unite in recommending singing for lung development, and, combined with physical exercise, nothing can be more healthful and desirable; parents like to hear their children sing, especially in harmony, if not, how do the piano fortes and organs get into the houses? Society, according to Shakespeare, requires it, for

— "The man that hath no music in himself,
Nor is not mov'd with concord of sweet sounds,
Is fit for treasons, stratagems, and spoils;
The motions of his spirit are dull as night,
And his affections dark as Erebus:
Let no such man be trusted."

Why not in the school-room? Because the art is surrounded by so many formidable difficulties that teachers, with few exceptions, would rather teach Greek Prosody or the Differential Calculus than attempt to investigate the intricacies of clefs, signatures, and the dominant seventh! My respect for the staff notation is too great to allow it to be thought that the Tonic Sol-fa is designed to supersede it; on the contrary, I consider the latter the most successful stepping-stone to a correct and intimate knowledge and analysis of the former. Nine-tenths of those who learn the Tonic Sol-fa are able to sing nearly as well the notes of the five-line system at sight, for they use the new notation to translate the old by a rapid and easy process. By its means the insurmountable difficulties presented in the established notation melt away, the hieroglyphics become intelligible, and the bright dawn of hope illumines the previously dark, mysterious music sheet. However, the Tonic Sol-fa is complete in itself, and the works of many of the great masters have been translated into it, as well as difficult cantatas, oratorios and choruses. By means of this popular system the music is read as easily as ordinary reading, and is learned much more quickly, even by young

children ; while the fact of their grasping the means of learning to sing at sight, possesses such an attraction that they, as well as grown-up children, are frequently quite infatuated with it.

The Tonic Sol-fa system being only an interpretation, possesses no new principles, it only renders intelligible what was hitherto indistinct and difficult of comprehension. It has, obviously, several new features, and at first sight seems so entirely different from the appearance of music, as we have been accustomed to see it, that persons looking at it superficially cannot imagine how music can be produced from it. Its simple arrangement is its beauty ; and a short study will convince anyone, not a sceptic, that the plan and development are really those of a natural system, adapted to the language, and suited to the capacity of persons, old or young, who possess a correct voice and ear, and a moderate amount of education.

The characteristics to be observed by learners of this system are:

1. *The Mental Effects of Tones in Key.*
2. *A Movable Tonic or Key-note.*
3. *Linear Time Measurement.*

I shall discuss these in order.

(1). The effect produced on the mind by certain sounds is so well known that it is needless to particularize, except in the case of musical sounds. The baby-song soothes the infant to sleep with its soft and gentle cadence ; the martial clang and clash of brazen throats excites the soldier to daring deeds of valour ; the sorrowful wail of minor chords brings a sigh or a tear, and calls up sad and tender feelings ; the jubilant tones of cheerful, joyous voices ringing wildly out, tingle a chord in the breast of the misanthrope, and, for the time being, he resumes his membership in the human brotherhood. Pathetic, joyful ; martial, soothing ; sad, gay ; defiant, cheering ; commanding, appealing—all owe their peculiarity to the prevalence of the particular note or tone in the scale which chiefly enters into the composition of the piece of music and gives a colouring, so to speak, to the whole.

Every teacher knows that sun-light is capable of being analyzed into seven distinct colours, as in the rainbow, or produced artificially by the prism. These colours are perceptible to the organ of sight, except in the case of those who are colour-blind, and in a similar manner each of the notes of the musical scale produces an "ear-colouring," or mental effect perceptible to the organ of hearing of most persons, when sung slowly, in its relation to the key-note. Mr. Seward, in his introduction to the "Tonic Sol-fa Reader," says :—"A new and interesting application of Sol-fa principles is now being made by Mr. Daniel Batchellor, of Boston, in the Kindergarten work. Mr. Batchellor was a well-known Sol-fa teacher in England, having taken the Advanced Certificate at the Tonic Sol-fa College of London. After his arrival in Boston, several years ago, he devoted considerable time to the Kindergarten work, and developed a very ingenious method of teaching tones by colours. His method has attracted much attention among prominent advocates of the Kindergarten system, as it adds a new educational element to that work."

It is this "ear-colouring," or mental effect, which enables the learner to sing any note which is pointed to on the modulator, or which he desires to produce, when the key-note is established in his mind, and by diligent practice in producing these notes independently he can sing them correctly when they are named, or when he sees the initial letter which distinguishes them. This is the first and most essential point in the study, and perhaps the most difficult, when that is reached, which is not long if the learner perseveres, the Tonic Sol-fa pleasure-ground is opened. In introducing the Modulator, I may here state that the names of the notes are the Anglicized forms of the Italian Do, Re, Mi, Fa, Sol, La, Si ; the last being changed to Te, which is more expressive, and has the advantage of possessing an initial letter which cannot be mistaken for Sol. The *l* is dropped in Sol, to preserve the full vowel sound.

To sing the scale we may start from a low tone, say middle C or D struck on an organ or piano forte, calling it DOH, and after sounding it two or three times to get it fixed in the mind, we may proceed to the next note upwards, RAY, and so on till we reach the octave DOH¹. In doing this we observe, (a) that there is a resting or firm note from which the others extend ; (b) that each note, as we regularly advance, has a different effect on the ear when sung slowly and not too loudly ; (c) that when we reach the seventh note the ear is not satisfied to allow us to cease singing until the eighth note is reached ; (d) that *RAY* and *FAH*, *TE* and *DOH¹*, that is, the third and fourth and seventh and eighth in the scale, seem to be closer together than any of the other two sung consecutively ; (e) that the eighth note, *DOH¹*, corresponds in sound and effect with the first.

The simple names of the notes, technical names, positions in the scale, and description of mental effects are as follows :

THE MODULATOR OR ALPHABET OF MUSIC.

MAJOR CHORD NAMES.		MENTAL EFFECTS OF THE NOTES.
	- s ¹ -	
	- f ¹ -	
	- m ¹ -	
	- r ¹ -	
Octave	- DOH ¹ -	
Sub-tonic or leading.	- TE -	Piercing or sensitive tone. <i>Leading effect (to tonic).</i>
Sub-mediant	- LAH -	Sad or weeping tone. <i>Melancholy effect.</i>
Dominant	- SOH -	Grand or bright tone. <i>Martial or gay effect.</i>
Sub-dominant	- FAH -	Desolate or awe-inspiring tone. <i>Appealing effect.</i>
Mediant	- ME -	Steady or calm tone. <i>Soothing or pleading effect.</i>
Supertonic	- RAY -	Rousing or hopeful tone. <i>Cheering effect.</i>
Tonic	- DOH -	Strong or firm tone. <i>Resting effect.</i>
	- t ₁ -	
	- l ₁ -	
	- s ₁ -	

The person who imagines that by singing the notes of the scale up and down regularly and correctly he is learning them, is just as much deluded as he would be if he taught the letters of the alphabet to a child by consecutive repetition from A to Z, and vice versa. The child should be instructed how to distinguish C from G, or B from R, and so on, thus securing mental effort in discrimination, and avoiding parrot-like routine. In the same manner the Modulator is to be learned by the discrimination of the ear, so that the mental effect of each note will become discernible to such an extent that when it is sung slowly by another—the key-note, or DOH, being previously given and firmly fixed in the mind—he will be able to distinguish and name it readily. In the early stages it is always better to commence with DOH, then find out any other note that the learner desires, say SOH, and by observing its effect, practice for some time that note with the key-note, thus—d, s, s, d ; s, d, s, d ; d, d, s, s, s, d, d. When SOH is firmly established in the mind, another note, ME, may be introduced, and exercises on the three performed in the same manner, &c.* In this way an intimate knowledge of the different tones may be acquired, and their production made easy and certain. Frequent practice on the Modulator is indispensable in all stages of the learner's course. "The Modulator," writes Prof. Seward very forcibly, "takes the place of the Staff in the common notation. It stands behind every note we see in the book. From habitual use of it the mind's eye always sees it there. It is our 'pictorial symbol of tone relations.'" When it is mastered the notes seem to be no longer in one continuous line, but to place themselves in imagination in relative positions on a Modulator in the mind, and the voice naturally follows the direction on the mental vision. The proper sound of the note also allies itself so closely to its name that merely singing the name leads to singing the correct sound attached

* Prof. Seward's book, "The Tonic Sol-fa Music Reader," gives full instructions on this subject, and contains quite sufficient information for a complete elementary course.

to the name, and it is this peculiarity which enables the practised learner to read the music fluently, in short, resolves it into ordinary reading.

In the above modulator, which is given to show only the tonic relationships in a single key, it may be observed that the upper octave notes are distinguished by a figure (1) placed towards the upper part of the initial letter; in the lower octave towards the lower part (1).

The following Modulator exercise has no indication of time, and each note may be sung slowly at first and afterwards faster, taking care that the same number of regular beats, made by moving the hand up and down or by tapping on the table, be given to each:—
Doh (or key-note) is C.

d d m m d m s s m m s m d s m d
m s s m m d m s m d s m d s d

Take D for key-note and perform the same exercise, also E and F.

(To be continued).

Examination Questions.

JULY EXAMINATIONS, 1881.

FIRST CLASS TEACHERS.—GRADE C.

ARITHMETIC.

TIME—THREE HOURS.

Examiner—J. C. GLASHAN.

1. Examine the merits of the following test of the accuracy of a sum in addition:—"Divide the sum of the digits in each horizontal line by 9, retaining only the remainders; divide the sum of these remainders by 9, and if the remainder then obtained be equal to the remainder obtained on dividing the sum of the digits in the answer by 9, the answer is correct."

Will the rest apply if "vertical lines" replace "horizontal lines" in the preceding; and if so, why?

2. A man sells goods for \$1125. Half he sold at an advance of 25 per cent. on the cost, two-fifths at an advance of 12½ per cent., and the remainder at half cost. What did he originally pay for the goods?

3. If four pumps, each having a length of stroke of 3 ft. and piston radius of 3 inches, empty a cubical cistern whose side is 6 ft., in 1 hour; what must be the radius of the piston of each of 6 pumps whose stroke is 4 ft., that they may empty a cistern whose sides are half those of the former in ¾ of an hour, there being a defect in the latter pumps which takes away 10 per cent. of their efficiency?

4. A tax bill for \$291.60 may be paid in three instalments—\$111.00 on June the 25th; \$90 on August the 4th; and \$90 on October 4th. If all be paid on June 25th a reduction is allowed of 1/10 of the instalments that might have been deferred. What rate per cent. per annum is this allowing for money?

5. A bankrupt's apparent assets are 80 per cent. of his liabilities; but on \$20,000 of these assets he recovers only 80 cents on the dollar, and 4 per cent. of the amount the estate actually realizes is consumed in the process of winding it up. He pays 60 cents on the dollar; what were his liabilities?

6. A gives B. \$210 on May 11th, and in return takes his note at 5 months, agreeing not to exact interest. On June 11th, A. sells the note to C. for \$205, and B. makes good to A. the \$5 so lost. When the note falls due, C. exacts interest at 7 per cent. per annum. Find the rate per cent. per annum gained, lost or paid by the several parties to this transaction.

7. A municipality whose property is assessed at \$1,000,000 borrows \$40,000; find an expression for the tax (rate in the dollar) that must be levied to form a sinking fund that will repay this in 10 years, money being worth 6 per cent. per annum, the taxes being levied yearly and money compounded half yearly.

8. The sides of a triangle are 4, 5, 6; find its area.

9. Eight equal spherical iron balls, radius 1 foot, are just enclosed in a cubical box, and the box is then filled up with water. Compare the weights of iron and water in the box, the specific gravity of iron being 7.79.

Give the expression for the surface of a sphere in terms of its radius.

10. Show how to determine the surface of a right circular cone. The height of a frustrum of such a cone is three feet, radius of two feet, and semi-vertical angle 30°; find its surface. If this surface were made of paper, and, being cut from the cone, were spread on a flat surface, find the dimensions of the curve formed by what was the bottom edge of the cone.

ALGEBRA.

TIME—THREE HOURS.

Examiner—ALFRED BAKER, M.A.

1. If $x^2 + y^2 + z^2 + 2xyz = 1$, then

$$z\{(1-x^2)(1-y^2)\}^{\frac{1}{2}} + x\{(1-y^2)(1-z^2)\}^{\frac{1}{2}} + y\{(1-z^2)(1-x^2)\}^{\frac{1}{2}} = 1 + xyz.$$

also,

$$\left\{ \frac{1+x+2yz}{1-x} \right\}^{\frac{1}{2}} + \left\{ \frac{1+y+2zx}{1-y} \right\}^{\frac{1}{2}} + \left\{ \frac{1+z+2xy}{1-z} \right\}^{\frac{1}{2}} = \frac{x+y}{1-z} + \frac{y+z}{1-x} + \frac{z+x}{1-y}.$$

2. Solve the equations

(1). $x^2 + 4xy + y^2 = 13 = 8xy - 7x^2 + y^2.$

(2). $(1+x)^2n - (1-x)^2n = (1-x^2)^{\frac{1}{n}}.$

3. If a be a root of the equation $f(x) = 0$, then $x-a$ is a factor of $f(x)$.

The equation $4x^3 - 52x^2 + 49x - 12 = 0$ has two equal roots; find all the roots.

The roots of the equation $x^4 - 10x^3 + 32x^2 - 38x + 15 = 0$ are of the form $\alpha+1, \alpha-1, \beta+2, \beta-2$; find all the roots.

4. Sum the series

$$1^2 + 2^2 + 3^2 + \dots + n^2.$$

5. Show how to find the sum of an Arithmetical Progression, having given the first term, common difference, and number of terms.

Sum to n terms the series whose first term is a , and the successive differences $b, 2b, 3b, \dots, (n-1)b$.

6. Sum to n terms the series

$$1 + 3x + 5x^2 + 7x^3 + \dots$$

If the natural numbers be divided into groups 1, 2+3, 4+5+6, &c., find the sum of the n th group, also the sum of the first n groups, and thence deduce the sum of $1^2 + 2^2 + 3^2 + \dots + n^2$.

7. Find the number of combinations of n things, r together.

On a shelf are 20 books, of which 5 vols. are of one set, 3 of another, and 2 of another, and the rest are odd books; find the number of different arrangements that can be made with them, each set being kept intact, though the order of books in it may be changed.

8. Two equal circles touch a straight line at A and B , and do not intersect, and on each of them at equal intervals are situate $2n+1$ points, A and B being such points. The only lines that contain more than two of the points are those that are parallel to AB . Find the number of triangles that can be formed by joining these points, both circles being utilized for each triangle.

9. Show how to determine the greatest term in the expansion of $(a+x)^n$.

10. (1) The coefficient of x^r in the expansion of $(1-x)^{-\frac{1}{2}}$ is $\frac{1 \cdot 3 \cdot 5 \cdot \dots \cdot (2r-1)}{2^r r!}.$

(2). If a_r be the coefficient of x^r in the expansion of $(1+x)^n$, then, n being a positive integer,

$$\frac{a_1}{a_0} + \frac{2a_2}{a_1} + \frac{3a_3}{a_2} + \dots + \frac{na_n}{a_{n-1}} = \frac{1}{2}n(n+1).$$

EUCLID.

TIME—THREE HOURS.

Examiner—ALFRED BAKER, M.A.

1. Where would the difficulty in the theory of parallel lines present itself, if they were defined to be such that a transversal falling on them made the alternate angles equal?

2. If there be two straight lines the rectangle contained by their

sum and one of them is equal to the square on that one together with the rectangle contained by the two straight lines.

3. In any triangle the squares on the two sides are together double of the squares on the half the base and on the straight line joining its bisection with the opposite angle.

If a point be taken such that the sum of the squares on the lines joining it to the angular points of a square is equal to three times the square itself, the locus of the point is a circle whose diameter is equal to a side of the square.

4. The angle at the centre of a circle is double the angle at the circumference upon the same part of the circumference.

Hence show that the angle in a segment less than a semi circle is greater than a right angle, and in one greater than a semi-circle is less than a right angle.

5. If a point be taken within a circle the rectangle under the segments of any chord through it is constant. Prove only the general case.

Given the vertical angle and base of a triangle, and also the rectangle contained by the difference between the other two sides and one of them, construct the triangle.

6. Describe a circle to touch three given straight lines.

If the three points in which an escribed circle of a triangle touches the sides be joined, the triangle so formed will be obtuse-angled.

7. AB is a given straight line, C its middle point, and D another fixed point in it. CE is drawn at right angles to AB and in it any point F is taken; FD is produced to G , so that as F changes its position in CE the rectangle $FD \cdot DG$ is always equal to the rectangle $AD \cdot DB$, shew that the locus of G is a circle.

8. Triangles of the same altitude are one to another as their bases. Triangles are to one another in the ratio compounded of the ratios of their altitudes and bases: prove this after the manner of Euclid.

9. To describe a rectilinear figure that shall be similar to one and equal to another given rectilinear figure.

CHEMISTRY.

TIME—ONE HOUR AND A HALF.

Examiner—E. HAANEL, Ph. Dr.

1. It can be demonstrated that the flame of a Bunsen gas lamp becomes non-luminous, whether the gas allowed to mix with the coal gas in the long tube of the lamp be common air, carbon dioxide or pure nitrogen. Show that this fact is *not* in harmony with the received theory, accounting for the nature and structure of flame.

2. At 26°C . the density of nitrogen tetroxide approaches 46. How should the formula for this compound be written to correspond to this density?

3. Required to prepare nitrogen monoxide from ammonium nitrate:

(i.) Write out the equation representing the reaction occurring in its preparation.

(ii.) Represent by diagram the apparatus required for its elimination and collection.

(iii.) Name the properties of the gas.

(iv.) State what precautions must be observed in preparing this gas, when intended to be used for inhalation.

4. As the result of a certain experiment, it was found that 50 litres, measured at 5°C . and 758^{mm}P ., of a mixture of oxygen and ozone, containing 18 per cent. of the latter, when allowed to bubble through a solution of hydrogen dioxide, were just sufficient to completely decompose it. Calculate from this data the quantity of hydrogen dioxide present in the original solution.

5. Write out the atomic and molecular equations representing the reactions occurring in the preparation of—

(i.) Oxygen from potassium chlorate.

(ii.) Hydrogen from water by the action of sodium.

(iii.) Nitrogen tetroxide by mixture of nitrogen dioxide with oxygen.

6. Contrast the properties of oxygen, phosphorus and sulphur with those of their respective allotropic modifications.

7. Write out the formulae for the following compounds:—Sodium chloride, sodium hydroxide, sodium oxide, calcium chloride, calcium hydroxide, calcium monoxide, aluminium chloride, aluminium hydroxide, alumina, potassium nitrite, potassium nitrate, potassium sulphite, potassium sulphate, potassium iodide, potassium iodate.

HEAT.

TIME—ONE HOUR AND A HALF.

Examiner—E. HAANEL, Ph. Dr.

1. Define the term "linear co-efficient of expansion," and show how the cubical co-efficient of expansion of a solid may be found by calculation from its known linear co-efficient. Describe also a method for the *direct* determination of the cubical co-efficient of expansion of a solid.

2. If 120 cubic units at 10°C . become $128\frac{1}{2}$ cubic units when raised to 40°C ., what is the cubical and what is the linear co-efficient of expansion?

3. (i) Describe fully the process of accurately determining the fixed points of a mercurial thermometer.

(ii) Reduce 28°C . to the F . and R . scale, and -13°R . to the F . and C . scale.

4. Define the term "specific heat," and describe the "method of mixture" for determining the specific heat of a substance.

5. A piece of metal weighing 809.06 gr. heated to 100°C was immersed in 2000 gr. of water at 0°C . The resulting temperature was found to be 4°C . Calculate from these data the specific heat of the metal.

6. If two pounds of ice at 0°C . be mixed with 5 pounds of water at 61°C ., what will be the temperature of the mixture?

7. One pound of saltpetre at 15°C . is dissolved in 8 pounds of water at 15°C . Does any change of temperature take place? Give reasons for your answer.

8. In order to bring a beam of dark heat to a focus by means of a double convex lens, of what material should the lens be constructed? Give reasons.

ELEMENTARY MECHANICS.

TIME—THREE HOURS.

Examiner—J. C. GLASHAN.

1. Define a Couple, and shew that the forces composing one do not admit of a single resultant.

State the various transformations that may be made on a couple without alteration of effect. Establish the truth of one of them.

The sides of a quadrilateral are acted on by forces perpendicular to them and proportional to them in magnitude, the forces being turned inwards. Show that if the points of application divide the sides in a constant ratio they reduce to a couple.

2. Find the centre of gravity (1) of a triangular area; (2) of three uniform rods forming a triangle.

In the latter case, if the system be suspended by a string attached to a point in one of the sides, find the position of the point that the triangle may rest with one side vertical.

3. State Newton's Laws of Motion, and explain the nature of the reasoning by which they are arrived at.

Shew how the second and third enable us to exhibit dynamic phenomena by means of equations.

4. (1) A gun (wt. 3 tons) rests on a plane of inclination 30° to the horizon, being pointed downwards parallel to the plane; a shot of 60 lbs. is discharged from it with a velocity of 1500 feet per second. Find how far up the plane the gun will recoil.

(2) Two weights of 5 and 10 lbs. are attached by a string, the heavier hanging vertically from the edge of a smooth horizontal table on which the lighter rests. Determine the motion.

5. The normal pressure on a surface exposed to the action of a fluid is equal to the pressure on a plane horizontal surface of equal area at the same depth below the surface that the centre of gravity of the first surface is, gravity being the only force acting.

A tetrahedron whose faces are equilateral triangles is just filled with fluid and has three of its corners in a horizontal plane; shew that when the fourth is above this plane the total pressure on all the sides is three times the total pressure when this corner is below the plane.

6. When a body is immersed in a fluid it loses a portion of its weight equal to the weight of the displaced fluid.

A sphere of radius a is composed of a substance n times heavier than water; find the radius of a spherical portion that must be hol-

lowed from its inside that it may float in water with $\frac{1}{n}$ th of its volume above the surface.

HISTORY.

TIME—THREE HOURS.

Examiner—JOHN WATSON, M.A., L.L.D.

(Only six of these questions are to be done.)

1. Describe the circumstances which led to the invitation to England of William of Orange, and explain the considerations which induced him to accept of it. State the causes of the discontent which followed his accession.
2. Explain the advantages over the old system of Sunderland's plan for choosing the Ministers of the Crown.
3. Give the substance of the statute of Edward III. as to High Treason. Point out its main imperfection, and show the strained constructions to which that imperfection gave rise. What improvement was effected by the statute of William III.?
4. Explain the political significance of the impeachment of Sacheverel. What light does the trial throw on the distinctive principles of the two great parties in the state?
5. What was the object of the War of the Great Alliance? How far was that object realized by the Treaty of Utrecht? Give the arguments for and against the Peace.
6. State the causes which tended to prevent the final Union of England and Scotland; the terms on which the Union took place, and the benefits flowing from it.
7. Explain the policy of George III., and describe his relations with successive Ministers. What constitutional change was brought about by his policy?
8. Describe the political condition of the American Colonies on the accession of George III., and explain the causes which led to their separation from England.
9. Trace the progress of the principle of Religious Toleration from the Revolution to the reign of George III., and describe the changes in the social and religious condition of the people produced by the Religious Revival of Whitfield and Wesley.
10. Give a short account of the industrial progress of England in the eighteenth century, mentioning the chief inventions. What is the main principle underlying the "Wealth of Nations?" Describe Pitt's financial policy, and point out its political results.

ENGLISH LITERATURE.

TIME—THREE HOURS.

Examiner—J. M. BUCHAN, M.A.

1. BRU. It must be by his death; and, for my part,
I know no personal cause to spurn at him,
But for the general. He would be crown'd—
How that might change his nature, there's the question.
It is the bright day that brings forth the adder, 5
And that craves wary walking. Crown him?—That;—
And then, I grant, we put a sting in him,
That at his will he may do danger with.
The abuse of greatness is when it disjoins
Remorse from power. And, to speak truth of Cæsar, 10
I have not known when his affections sway'd
More than his reason. But 'tis a common proof
That lowliness is young Ambition's ladder,
Whereto the climber-upward turns his face;
But when he once attains the upmost round, 15
He then unto the ladder turns his back,
Looks on the clouds, scorning the base degrees
By which he did ascend. So Cæsar may:
Then, lest he may, prevent. And, since the quarrel
Will bear no colour for the thing he is, 20
Fashion it thus: that what he is, augmented,
Would run to these and these extremities;
And therefore think him as the serpent's egg,
Which, hatch'd, would, as his kind, grow mischievous,
And kill him in the shell. 25
- Julius Cæsar, Act ii., scene 1.
- (i.) Explain the meaning of 'general' and 'would,' l. 3.
 - (ii.) Develop fully the comparison implied in ll. 5 and 6.
 - (iii.) And to speak truth, etc. What is the connection in thought between this sentence and what precedes?
 - (iv.) What is the meaning of 'proof,' l. 12?
 - (v.) And, since the quarrel.....extremities. Paraphrase so as to express the meaning fully.
5. Sketch briefly the characters of Antony and Casca in the play of Julius Cæsar.

3. Compare the burghers of Stirling, in the Lady of the Lake, with the citizens of Rome in Julius Cæsar.
4. In what respect does the character of Scott's literary work most closely approach that of the work of Shakespeare?
5. Give an account of the contents of the last canto of the Lady of the Lake.
6. Reproduce, in your own words, Addison's account of Sir Roger de Coverley's visit to Westminster Abbey.
7. State clearly on what Dr. Johnson's fame principally rests.

Selections.

HEALTH THROUGH EDUCATION.

BENJAMIN WARD RICHARDSON.

Address delivered at the Conference on Education, held in the Rooms of the Society of Arts, January 16, 1880.

Concluded from last Month.

A second point in relation to mental health in education to which I would wish to draw attention relates to the constitution of the body, the stamina of the body—to use a good and expressive term—for work of mind. Just as children of quite different mental stamina are set to the same labours, and are expected to do the same kinds of labour with equal success, so in like manner children of different bodily stamina are expected to do the same labours, and to produce out of them the same results. No error can be more fatal. The class is under the eye of the teacher, in line before him. In one sweep of vision, if the class is a large one, he takes in all the diatheses, all the deep constitutional tints and taints of disease. If he swept his fingers over the keys of a pianoforte he could not detect a more definite series of regular changes.

There is the child with blue eye, light flaxen hair, fragile form, pale cheek, finely chiselled ear, delicate hand, quick apprehension, and nervous, almost scared, nature. That child can be taught almost anything and everything. It may be a very ambitious child, but it is easily put down, and it is always, on the least emotion, vibrating or palpitating. It is the type of the true tuberculous child. You will find of a certainty that some members of its family have died of tuberculous disease in one or other of its forms, most likely of pulmonary consumption. This child may be precocious to an extreme degree, may lay up learning like water, and become morbid in the acquirement of knowledge, but it is always vibrating and constitutionally feeble.

There is another, of the same general construction, but of much coarser mould, an obviously defective child, with nothing to fascinate; a head probably a little misshapen, the crown somewhat raised and pointed; the face pale; the eye blue or bluish-grey; the ear not well shaped, the hair stiff, so that it has to be cut short to look passable; the hands large and clumsy; the mind rather stolid, and not over appreciative, but fairly steady at work; the manner subdued and obedient; the nature trusting, but somewhat selfish, and often fretful. This is the type of the strumous child. This child can never work with zest; it has no precocity; when it labours hard, it soon becomes as it were benumbed, and the firmest teacher bids it go out and ran, or lets it sit down and sleep.

There is another type in the class equally distinctive. The head is large; the face large and probably ruddy; the lips large; the eye grey or a light blue; the hair reddish brown; the ear large with a big lower lobe; the hands big; the body inclined to be plump and the joints large and clumsy. The minds of this type are slow, but at the same time receptive, they are good-natured and heavy, but they bear disappointment badly, and punishment of all kinds very badly. Neither much work nor much play is in them. These are

types of the rheumatical diathesis. You would find in them, as family physical taints, rheumatism, neuralgia, gout, as direct conditions of natural habit; and epilepsy, chorea Sancti Viti, heart-disease, and dropsy as the secondary or indirect manifestations of the primitive taint which they have inherited.

There is a fourth class, most distinct from all the foregoing: a type of child in which the body is small; the head, by comparison, large; the eyes very dark; the complexion swarthy; the hair dark; the lips large; the nose large; the ear large, and the lower lobe pendulous; the body either very small and fragile, or of a size above the usual; the mind appreciative, absorbing, reticent, and self-retained, with a keen sense of its own individual interests, but with small sympathies, and with brooding imagination. This child is a type of the true bilious temperament. It has always in it some blood born of a tropical clime: it has great capacity for work of a mental order, and often for varied work of that kind. It is a type of a child fairly healthy during childhood, but suffering often from dyspepsia, ague of the face, small eruptive swellings, and frequent depression of spirits, amounting sometimes to actual sadness. It has a very limited capacity for all muscular efforts involving the qualities of endurance and courage, but is devoted usually to music, and is gifted with musical and artistic ability.

Lastly, amongst the really prominent types, there is the scholar of low mental capacity altogether, and by physical condition incapable of illustrating the active working mind. The children of this type are usually either of small or of very gross build of body. They are unduly pale and fragile: they have irregular or notched teeth; compressed features; very scanty and dry hair, often some bodily deformity, such as strabismus; diminutive heads; and a feeble, sluggish circulation. These constitute, mainly, the class of children whom I have described in my work "Diseases of Modern Life" as children in whom idleness is a veritable disease. You may do what you will with them, you cannot make them work; you may pet them, encourage them, punish them, they are the same. They grow up listless and helpless, and as a rule die of some organic disease of a nervous character before they have reached the full meridian of life.

I have drawn out sharply five classes of types. In these there are various shades and qualities. In the first class there is now and then a specimen of great mental strength, and often of great physical beauty. In the second, there is often extreme vigour of mind, brightness and tenacity. In the third class there are, as a rule, many specimens in which both mind and body are active and powerful. In the fourth the mental power is frequently excellent and strangely analytical in its character. Of the fifth I need say no more than has been said.

In large schools with the scholars of which I have come in contact it has occurred to me to observe all the distinctive types and shades of type here named, and a few times in science-teaching I have been able to compare and test in a fair way the mental by the side of the physical characteristic. Those who are teachers know these classes as well as I do, I dare say a great deal better, though they might not like to define them so minutely. I define them because I want to enforce this grand truth, that it is utterly hopeless for parents to expect the teachers of their children to produce great results while the system is enforced of teaching all these children on one uniform system, and while the teacher is debarred the privilege of forming a judgment of capacity in respect to the individual scholar. There can be no mental health in education while pupils of the last class I have named are put in order with those of the first and third. There can be no mental health in education while the brightest and the quickest of the first class, the precocious of that class, are allowed to indulge their precocity for learning, and

are trained into an ambition which almost of a certainty will, in a very few years, imperil both their mental and their physical organization.

The practical lesson I would enforce is that the teacher and the parent of the child taught should have between them a better understanding in relation to the mental and physical capacities. The quick precocious child of the first class may, under pressure, be taught anything, but the exertion of pressure at the risk of future disease of the most fatal kind. The child of bilious temperament may be taught with difficulty, but the effort to teach it may be the most useful in arousing its physical powers into new and active life. The first can be killed through the brain, the second can be saved through it. While, in respect to the last-named class, the class of child in whom the brain-ement is so consolidated that there is no free cellular activity, every attempt to overcome inertia, may be the very means of increasing and intensifying inertia.

From the reflections which arise after the study of these different classes of children, I am next led, in thinking over the matter of mental health in education, to touch on the subject of limitation of work in youth. The more I see of school labour, the more certain I become that the strain commonly put upon the youthful mind is altogether opposed to health. It is a matter now of nearly daily task for me to have to suggest relaxation or removal of the young from school or student labour, on account of health. In these days no organs of the body are forced so much as the brain and the senses which minister to it.

There are two reasons for this cause of evil action.

The first reason is the utterly absurd general opinion that the period of education is to be limited by the periods of life, and that with the attainment of the majority the day of learning has ceased. If we could get over this transparent yet all but universal fallacy, we should do more to regenerate the world than by any other effort of an educational character. We could then make life a continual feast of learning. We could fill the vacancies between business and rest, vacancies which are now filled often by the most poisonous and injurious pursuits, called pleasures—pleasures which satiate by their repetition and ruin by their inanity; we could fill these vacancies with delights of new worlds of knowledge which, ever changing, were ever bringing new spirit and wholesome repose. We should do far more than this—grand as the prospect of cultivating an unweary life may be—we should take off the strain from the young brain, when all the natural powers are required, not for the using up of the brain in the service of learning, but for the service of the brain itself, for its own growth and development and preservation.

My view is that the duties of the teacher and of the learner in relation to learning should never cease, but that the aim should be to discover in what periods of life such and such processes of learning are best cultivated, and to make life divisible into periods devoted to the attainment of certain phases and forms of knowledge. I take the case of one I know best. He, when a boy, had great powers of memory for words and discourses and poetry, but had little power of memory for dates and details. When he was thirty that power of memory by committing to heart began to fail, but the power of memory for details improved in a surprising degree, so that he could without an effort learn new sciences which before were to him closed books. Later on in life he found, in like manner of change, a facility for artistic learning and for the study of forms of which earlier in life he had no notion.

What is true in this one case is, I believe, true of men generally. The man I refer to has, in later life, simply found it easy to acquire that which was not by force forced upon him, and thereby forced out of him, in early life, so that in many ways he would actually like to pick up his satchel and go to school again. We want this finding extended generally. If we could take off the pressure of early mental training, so as to improve the mental health of education, we should in turn improve the method of education. We should do this in various ways. We should limit time so that boys under twelve would not be pressed with more than four hours of work, and girls with not more than three hours, daily. After this we should apportion more and more of time for work until the maximum of six hours for either sex was obtained.

In other ways we should conserve. We should not strive to teach by short cuts and clever devices until such short cuts and

clever devices become more complicated and laborious than the subject itself which is taught by them. I give one example, and that only, of what I mean. There is a book recently published, called a Latin Grammar, in which the Latin language is tried to be taught for I presume teaching is the aim of the composer—by rules which are, to my mind, much harder to learn than the language. To make these rules facile, they are illustrated by doggerel verses so atrociously bad that they make the flesh creep to listen to them. They would have knocked all the verse out of Shakespeare himself had he been tortured with them. The object, I am told, is "short-cut." To enable many facts to be taught in a short time, it is requisite to artificialise the mind with foreign matters, in order to make it take in more; therefore so much brick rubbish is used on which to lay an unsound foundation for an edifice that is not intended to stand beyond the majority of its owner, but which is fully expected then to fall to the ground or to remain a useless ruin. So the minds of grown-up men are filled with the ruined edifices of learning, shapeless, empty and valueless.

To the errors which are thus cultivated by the crush of education in early life, and which breed a dislike for education in after-life, there is added, in our modern systems, another error that of making learning, which should be as quiet as a mill stream, competitively furious. I confess I stand daily appalled at the injury to mental and physical life which I see being penetrated in this way under the name of learning. Thirty years ago matters were getting bad, now they are getting hopeless. At that time one sex, at all events, was safe from the insanity. Women were saved from competitive mental strain, so that the progenies that were to come and replenish the earth were born with promise of safety from mental degeneration, on the maternal side at least. Now, however, women are racing with men, in strife to find out who shall become mentally enfeebled and crippled first. The picture looks terrible indeed.

The picture is terrible, and for the future would be positively calamitous, but for one gleam of hope which, as I will show by-and-by, is cast over it. At this time we look fairly and honestly round to find a great many men still playing an active part in the affairs of this world, writing useful and amusing books, conducting great organs of public opinion, making discoveries in science of the most extraordinary kind, composing songs, and, in a word, keeping alight the intellectual fire. Who are these men? Read their lives, and you will find that they are, I had almost said without an exception, men who in their early career have been under no competitive pressure, free men, whose brains at the period of maturity are not filled with ruined edifices or whitened sepulchres holding dead men's bones. This, you will say, is satisfactory so far. It is. But then comes the solemn question:—Who are to follow these? We look at the past history of men, and see that heretofore the men have always come. We look at the present, and are obliged to say: Yes, but in the future where shall they come from? The dearth has commenced in earnest, even at this time. How shall it be removed?

In the upper and middle classes the dearth cannot but remain while the current method of encouraging mental death by competitive strife is the fashionable proceeding. War-cries in learning, as in every other effort, have but one end—desolation, desolation! I am going to say a bold saying—bold because it is based on natural fact. I can find numbers of men who, having been born with good natural parts, have been turned into practical imbeciles by severe competitive strain; but I challenge the production of even one man of pre-eminent and advanced power who has been brought out in complete and sustained and acknowledged mastery of intellect by the competitive plan. "Glamis has murdered sleep"—competition has murdered mind. There is one university which more than all others is the offender, the exemplar in this regard. It is not a teacher; it is a destroyer of teaching. I do not call in question its good intentions, but I oppose its pride and declare its blindness; and I want you who are engaged in education to protest against the ruin of your good work which it and all who go with it are inflicting so determinately.

I said I would light up this subject with one gleam of hope for the future. I take that gleam from the Board schools; it is kept in them, and I trust it will always. If the Board schools will only maintain a moderate system of education; if they will simply be content to lay the foundations for the development of such men as Shakespeare, Priestley, Fergusson, John Hunter, James Watt, Humphrey Davy, Michael Faraday, William Cobbett, Turner, Flaxman, Richard Cobden, Charles Dickens, George Stevenson, David Livingstone, and others of such sort, all of whom would almost surely have been men-

tally abolished by the competitive ordeal, they will do a work which will be more than national, a work world-wide and lasting as time.

Happy, too, in the success of their undertaking, the Board schools may, by force of results, bring back to reason the erring crew who would cram all learning into the human mind in the first quarter of its existence, and leave it stranded there. It is a sad look-out for the now governing classes, one million in twenty-four millions, if this lesson be not soon learned. For knowledge alone is power, and knowledge with wisdom combined is victory and governance.

In this suggestion for the future, no thought is conveyed of placing the Board schools in opposition to the higher-class schools and the Universities. The higher-class schools and the Universities of these islands have played, in the past, a part second to none elsewhere. They have had their princes of knowledge, their Newtons, their Halleys, their Hamiltons, their Harveys—their hundreds of great scholars, poets, philosophers—all that is mentally noble, as their own. My argument is, that these great ones were theirs when they were content to cultivate industry, to nurse genius, and even to fan into life what might at first seem feeble and unpromising mental effort;—but that the like of these can no longer be theirs, if they continue to care less for the true culture than for the apparent, and only apparent, results of culture, and if, instead of sustaining the weak, they strive to become powerful by crushing and killing in their early life the strong as well as the weak by the like impatient pressure.

I had intended to touch on education as it should be modified according to seasons of the year, and on one or two other equally important topics, but my time is up, and I therefore content myself with offering, as the essence of my discourse, the following propositions:—

1. To secure health through education, it is requisite that a more systematic and scientific study of the psychology of the subject should be undertaken, and that class studies should be divided in regard to the mental aptitudes of the scholar.
2. Parents should expect teachers to exercise a fair and discriminating judgment as to the particular capacities of children under their care, and should be influenced by such judgment in the direction of educational work. The teacher should become, in short, like a second parent to the scholar.
3. Much greater care should be taken in observing the influence of special physical peculiarities of body and hereditaries on educational progress, while the influence of education on such peculiarities and hereditaries should be carefully learned and determined. By this means two useful purposes would be secured; education would be made to conduce to physical health, and physical health to education.
4. All extreme competitive strains in learning should be discontinued, as efforts calculated to defeat their own object, and to produce mental as well as physical degeneration.
5. In school-work, the Swiss system of teaching should be more closely followed; that is to say, very quick and precocious children should be directed rather than forced and encouraged, while dull and feeble children should receive the chief attention and care of the teacher.
6. Education should be so carried out as to make the whole of the life of men and women a continued process of learning, varied, at different ages, according to the changing capacities, faculties, and aptitudes for the different subjects included under the head of knowledge useful and universal.

Practical Department.

SUBJECTS FOR THE NON-PROFESSIONAL EXAMINATION, 1882.

I. For Second and Third-class Certificates.

INTERMEDIATE EXAMINATION.

English Literature.—Cowper's Task, Book III, Goldsmith's Deserted Village, Addison's Sir Roger de Coverley.

Ancient Languages.—(a) *Latin:* The Accidence and the Principal Rules of Syntax and Prosody; Exercises, Cæsar, Bellum Britannicum (B. G., Book IV. cc. 20—36; Book V. cc. 8—23); Cicero pro Archia, and Virgil, Æneid, Book II., 1—317; Learning by

heart selected portions of Virgil ; Re-translation into Latin of easy passages from Cicero. (b) *Greek*: Optional.

Other subjects same as for 1881.

FOR FIRST-CLASS CERTIFICATES.

I. FOR GRADE C.

English Literature.—*Prescribed Subjects*.—Richard II.—*Shakespeare* ; The Deserted Village.—*Goldsmith* ; The Task, Book III.—*Cowper* ; *The Spectator*—Papers, 106, 108, 112, 115, 117, 121, 122, 123, 125, 126, 131, 269, 329, 335, 517.—*Addison*. Johnson's Life of Addison ; Macauley's Life of Johnson. No particular editions of these texts are prescribed.

Other subjects same as for 1881.

II. FOR GRADES A AND B.

Same course as for 1881.

A TEACHER SHOULD

Labour diligently to improve himself, morally, physically, and intellectually.

Thoroughly understand what he attempts to teach.

Prepare himself for each recitation.

Require prompt and exact obedience.

Call on pupils promiscuously, as a rule, to recite.

Teach by precept and example.

Manifest an active interest in the studies and pursuits of pupils.

Make the school room pleasant and attractive.

Make few rules.—Do *RIGHT* covers all cases.

Avoid governing too much.

Let his pupils see he means what he says.

Take good care of his health. Retire early, rise early, bathe every day.

Teach the subject, not mere words.

Visit the schools of others.

Read the CANADA SCHOOL JOURNAL carefully, and make notes of what he reads.

Attend County Conventions, take part in the discussions, speak to the point, make notes of what is said at the Conventions.

Have complete control over himself.

Keep up courage if right, even when strongly opposed

Have good personal worth as well as learning.

Cultivate fluency of speech.

Encourage precocious as well as dull children to exercise freely.

Honour his trustees that his days may be long in the land.

A TEACHER SHOULD NOT

Talk much, or very loudly.

Promise what he cannot perform.

Threaten for anticipated offences.

Be hasty in word or action.

Punish when angry.

Speak in a scolding, fretful manner.

Be late at school.

Attempt to teach too many thoughts at once.

Use a hard word where an easy one will do as well.

Let his pupils see they can vex him.

Let a known fault go unnoticed.

Speak evil of others.

Magnify small offences.

Use stimulating drinks or tobacco. Tobacco using should debar any teacher from receiving a certificate.

Put off till to-morrow what should be done to-day.

Trust to another what he should do himself.

Believe all reports without investigation.

Indulge in vulgarity or trifling.

Encourage tale bearing.

Be weary in well-doing.

Use corporal punishment, except in extreme cases.

D. A. M.

SHOULD BOYS DO NEEDLE-WORK IN SCHOOL?

BY JAMES L. HUGHES.

If the only object accomplished by teaching needle-work in school was enabling the pupils to sew and knit, I would answer "no," although even with this limitation the question admits of discussion. When it is remembered, however, that the hand needs to be educated quite as much as the intellect, that it is capable of almost unlimited training, and that in most cases there is absolutely no provision made in schools for developing finger power or dexterity, there seems to be ample justification for answering "yes" to this important question. Boys' fingers are too often "all thumbs." Every parent knows that the fingers of girls are much more nimble and skilful than those of boys, but unfortunately in most cases they learn nothing by knowing this. They simply take it for granted that it is so naturally, ignoring the fact that this dexterity on the part of girls is the result of training and practice.

It is urged that "boys will not like to knit or sew." This is not correct. If we give them the idea that it is unmanly to do so, they will undoubtedly object, but the teachers will be to blame if the boys get or retain such an impression. They delight in doing light work with the fingers, and until we can get something equally good for boys to do with their hands in school, needle-work should be used for the training of the hand. It is also said that "it is undignified for a boy to sew or knit." This is a snob, or "Lord of creation" argument. If it is undignified for a boy to work, and to have active, skilful fingers, then he should not sew or knit.

The Boston School Board has been trying the experiment in one school of having the boys do needlework with the girls. They are convinced of the desirability and propriety of the plan, and so far the results have been satisfactory. During the last two years the boys in most of the junior classes in Toronto Public Schools have done the same needlework as the girls. They have done this, too, as a matter of choice, and not by compulsion. They had the privilege offered to them and they embraced it, when the benefits of such work were fairly pointed out to them. The boys themselves do not object; any opposition that has been given comes from thoughtless parents.

In the Kindergarten the boys and girls work together, and where true kindergartening cannot be introduced the best substitutes for the "work" side of it are sewing and knitting. Of course the boys in senior classes should not sew or knit in school, not that there is any objection to their doing so, but because they can be better employed at physical development of another kind. When boys are old enough to take systematic drill or calisthenic exercise, they should be engaged at these exercises while the girls are doing their needlework.

The cry is constantly raised for "skilled workmen." In several European countries this need for them is so greatly felt that special schools are established for their training. Why should not the public schools of a nation do something for the development of a race of men who will be able to work with skill and precision with their fingers, when such training may be given without loss of time, and without giving the teacher any extra trouble?

General Information.

To be read to the Scholars.

CHAMOIS skins are not prepared from the skins of the chamois, but from those of the sheep. The sheepskins are soaked in lime-water, also in dilute sulphuric acid, and fish oil is poured over them; then they are carefully washed in a solution of potash.

A telegraphic despatch sent from Paris will reach Berlin in one, one-half hours; Copenhagen in four hours; Constantinople in five hours; Dublin in three hours; Hong Kong in twelve hours; London in one, one-quarter hours; New York in four hours; and Vienna in one, three-quarter hours.

THE bread-fruit tree is distributed generally among the Friendly, Society, and the Caroline Islands. The tree is beautiful as well as useful, and rises to the height of forty feet. The fruit is green, heart-shaped, about nine inches long and equaling a large melon in size. When toasted it is soft, tender and white, resembling the crumb of a loaf but it must be eaten new or it becomes hard. Such is the abundance of the fruit that whole tribes subsist on this bread or fruit entirely.

PUGILISTIC TOADS.—A correspondent of the *Scotsman* writes as follows: "I always keep a number of toads in my orchid houses for the purpose of destroying vermin. The other morning, while watching two males, I was highly amused to see them have a regular set-to fight. They went at each other in a regular, scientific manner, sparring with their fore-paws, and butting with their heads. After a while they seemed to get tired, coolly sat down, and viewed each other with great complacency. From my earliest days I have been in the habit of watching the ways of the toad, and never having seen them fight before, would like to know if any of your numerous readers have witnessed such a scene.—I am, &c.—*Alec. Paterson, M.D.*"

WILD MEN.—In the island of Rio there are wild men who live in the trees, and who have no language but cries; and in Sumatra there are men who live in the forest, with whom not only the Europeans, but the Malays themselves, can have no intercourse. They stay in the woods, and subsist by the chase. They hunt the tigers, not with the gun, but with arrows, which they blow out of a tube with such force, and which are so keen of point and touched with such deadly poison, that a wound is almost immediately fatal. Their tiger skins or elephants' tusks they bring for barter. They never sell anything, for money is about the most useless thing they can have. They cannot eat it, nor drink it, nor wear it. But, as they have their wants, they exchange. Yet they themselves are never seen. They bring what they have to the edge of the forests, and leave it there; and the Malays come and place what they have to dispose of and retire. If the offer is satisfactory, when they return again they find what they had brought gone, and they take what is left and depart. If not, they add a few trifles to tempt the eyes of these wild men of the woods; and so at last the exchange is effected, yet all the while the sellers keep themselves invisible.

Notes and News.

ONTARIO.

Mr. C. W. Malloy of the 4th year in Toronto University, has been appointed second master in Searforth High School. Mr. Malloy is an experienced teacher and has won honours and scholarships at the University.

The Dundas High School Board have accepted the resignation of Mr. John Herald, M.A., Head Master, and appointed Mr. J. D. Bissonette to the vacancy, at a salary of \$1000. Mr. J. W. Dryden, of Brockville, has been appointed assistant master.

Mr. W. F. Rittenhouse, of St. Catharines, has been appointed Head Master of the Central School in that city, at a salary of \$700 per annum; and Mr. Rea was selected to fill the vacancy caused by the well-merited promotion of Mr. Rittenhouse.

Cobourg Collegiate Institute appears to be in a very prosperous condition. The attendance has, for some time, been too large for its staff, and the Board have recently added to it another master,

Mr. G. E. R. Wilson, who takes junior mathematics and English. There are now in all six masters and two lady teachers, the latter having charge of the drawing and painting department.

The vacancies in St. Thomas Collegiate Institute have been filled. That of Classical Master by Mr. R. Harstone, silver medalist and formerly Classical Master of St. Mary's, who was chosen out of twenty-five candidates. For teacher of Modern Languages, Mr. W. G. Shepherd, first-class honour man, Toronto University, has been selected out of twenty-seven applicants. These appointments have given much satisfaction. There are now six masters in the Institute. Mr. Harstone has had a distinguished University course and is spoken highly of as an excellent, practical teacher. Mr. Shepherd has proved himself an adept in his department. The city is to be congratulated on the accumulation of so much talent in its Institute, which must be productive of the best results to its "rising generation."

Mr. Hume, a graduate and gold medalist of Queen's College Kingston, has been appointed to the position vacated by Mr. McKay in Brampton High School.

A notice of motion was given recently in the London (Ont.) School Board to dispense with the services of the teacher of music in the Public Schools. Mr. McPhail, who is evidently a discriminating member, said he would be very sorry to find the teaching of music discontinued, and he succeeded in carrying a motion to have a teacher of that important and pleasing art procured. The music lesson would be a sad loss to the pupils, as it helps to brighten the mathematics and other dry studies which often over-tax the minds of children. There ought to be a Mr. McPhail on every School Board.

A candidate at the entrance examination for the High School, County of Bruce, spelled after this fashion:—"Nomitave, Prownown, Nuter, Speech, etc." He also laid down the proposition that a "verb agrees with its subject in case," and was of opinion that a "particle was a word, and a noun joined together." The same candidate stated that "a relative pronoun was a word used to mark some particular person, place, or thing."—*London Free Press.*

Dr. W. H. Law has been appointed Head Master of Streetsville High School.

In Weston High School, Mr. S. L. Barton, ex-mathematical scholar, in 1879, Toronto University, has been appointed Assistant Master in the place of Mr. Reid, who has returned to the University.

Mr. G. Cruikshank, 3rd year student, Toronto University, and first-class honour man in science, has been appointed Assistant Master in Prescott High School. Mr. Cruikshank received his education in Weston High School.

Mr. Joseph Nason, of Weston, graduated last May in Toronto, after a brilliant course, with double first-class honours in natural science. We understand that Mr. Nason intends to devote himself to the teaching profession.

The trustees of the Weston High School have determined to establish a reference library in connection with the School.

Mr. David Hicks, B.A., of Toronto, has been appointed Head Master of the Newburgh High School, at a salary of \$700.

Under the able management of Mr. Cortez Fessenden, B.A., Head Master, the attendance of Napanee High School has been doubled during the past year.

Brockville High School is reported to be in a prosperous condition. Mr. P. C. McGregor, M.A., late of Almonte High School, has recently taken charge. As Mr. McGregor is an energetic and enthusiastic teacher we may predict a successful future for his new field of labour.

Mr. Bell, late Classical Master, St. Thomas Collegiate Institute, has been appointed assistant professor in Classics, and Modern Languages, in Victoria University.

Sixteen pupils from the Caledonia Model School, Mr. Telford, Head Master, passed the Examination for Entrance to High School.

Mr. James W. Westervelt, late Teacher of Writing, has been appointed to take charge of the Commercial Department of the Canadian Literary Institute, Woodstock.

Mr. Telford has been appointed to the Head Mastership of Caledonia Model School, recently vacated by Mr. Hyslop.

Mr. J. C. Harstone, B.A., Math. Medalist and Proficiency Scholar, Tor. Univ., has been appointed Mathematical and Science Master in Whitby Collegiate Institute. Mr. Harstone is a very

distinguished Graduate and Scholar of Toronto University. He has been for the past three years Mathematical Master in Port Hope High School and has won there a front rank as a teacher. He comes to Whithy recommended in the highest terms by the Professors of Toronto University, by the High School Inspectors, by Messrs. Purslow, Kirkland, Bryant, and many other well-known Scholars. He assisted Dr. McLellan in the preparation of his works on Algebra and Mr. Kirkland on his Natural Philosophy, and publicly received the thanks of these authors. He has been very successful in preparing pupils for the various examinations.

RESULTS OF THE JULY EXAMINATIONS.

The percentage of successful candidates out of those who wrote at the Intermediate and Second-class Teachers' Examinations is considerably smaller this year than hitherto. It has been computed that only 29 per cent. passed, but even at that low figure some of the Collegiate Institutes and High Schools have made a good record. We give the results in a few instances, but these are liable to corrections, as in many cases our information has been rather vague; also, it frequently happens that through appeals, irregularities, errors, and such like, the record is augmented. If we are wrong we shall be pleased to publish the correct list in a future number. In the meantime we shall be obliged if Head Masters will kindly send us any intelligence they can with respect to this matter or any other that may be of interest to the profession.

- Perth High School. —Six in Grade B and nine Intermediate.
 London: from Collegiate Institute nine, and from County three in Grade B; ten Intermediate.
 Brampton High School. Seven B's and eleven Intermediate. Three matriculated at the Toronto University.
 Streetsville High School. —One in Grade B, three Intermediate.
 Peterboro' Collegiate Institute. One in Grade A, six in B, and six in C, out of forty-five who wrote.
 Whithy Collegiate Institute. —Eight passed, seven B's and one Intermediate.
 Listowel High School. —Five Grade B, and one Intermediate, out of twenty who wrote.
 Orangeville High School. —Four in Grade B, and five Intermediate.
 Collingwood Collegiate Institute. —Five in Grade A, twenty-three in Grade B, and eighteen Intermediate, making a total of forty-six out of ninety-five who wrote.
 Brantford Collegiate Institute. —Twenty-seven, three in A, four in B, and ten in C.
 Hamilton Collegiate Institute. —Twenty-four, out of eighty-nine who wrote.
 Sarnia High School. —Fourteen.
 St. Catharines Collegiate Institute. —Fifty.
 Napanee High School. —One in Grade B, three in C.
 Newburg High School. —Two in Grade C.
 Bath Public School. —One in Grade C.
 Albert College. —Four in Grade B.
 Kingston Collegiate Institute. —Two.
 Pickering College. —Out of ten who wrote nine passed, four in B, five in C. Eight candidates were examined for Matriculation at Toronto University, and all passed.
 Bowmanville High School. —Three Grade A, eight Grade B, and two Intermediate. Twenty-two wrote.
 Weston High School. —Out of fifteen who wrote nine passed, one in Grade A, five in B, and three Intermediate. One candidate for matriculation passed with honors in English.
 St. Thomas Collegiate Institute. —One in Grade A, twelve in B, and nine in C. Four candidates passed for senior matriculation last May.
 Oshawa High School. —Out of 16 who wrote, one obtained Grade A, five B, and three C. At the Matriculation Examination in May, the eight candidates sent up passed, out of whom two obtained first-class, and two second-class honours in mathematics; one first-class, and three second-class honours in German; and two second-class honours in English.
 Lindsay High School. —Sixteen; one A, seven B, eight C, out of sixty examined.
 Port Perry. —Seventeen; two A, nine B, six Intermediate.
 Waterdown High School. —One first-class, and seventeen Intermediate.
 Barrie Collegiate Institute. —Two in Grade A, seventeen B, and nine Intermediate.
 Clinton High School. —Fourteen.

Toronto Collegiate Institute. —Out of sixty-eight who wrote; thirty-one passed: two A, twenty-one B, and eight Intermediate.
 Elora High School. —Fifteen passed out of thirty-four who wrote, two in A, eight in B, and five Intermediate.

Dundas High School. —Seventeen wrote; three passed, one A, one B, one Intermediate.
 Chatham High School. —Thirty-six wrote; seven passed, —four in B, and three Intermediate.
 Port Hope High School. —Eighteen successful out of twenty-five who wrote; three in A, thirteen in B, and two Intermediate.
 Uxbridge High School. —Seven successful out of thirty-six who wrote.

Cayuga High School. —Two in B, out of fourteen who wrote.
 Dunville High School. —Ten passed out of twenty who wrote.
 Caledonia High School. —Twenty-three passed out of fifty-three who wrote, —two in A, twelve in B, and nine Intermediate.
 Guelph Collegiate Institute. —Thirteen.
 Orillia High School. —Two successful; nineteen wrote.
 Belleville High School. —Eleven.
 Markham High School. —Thirteen passed; eighteen wrote.
 Canadian Literary Institute, Mr. N. Wolvorton, B. A., principal. —Six.

Woodstock High School. —Eight.
 Seaford High School sent up 35 Candidates, and passed 13; eight B, and five Intermediate.

Cobourg Collegiate Institute. —Twenty-two successful out of fifty-one who wrote.

Stratford High School. —Six.
 Strathroy High School. —Eighteen out of twenty-one who wrote.

Out of 180 candidates who recently presented themselves for matriculation at the University of Toronto, 156 passed. Of this number Brantford sent 19, sixteen from the Collegiate Institute, seven of whom were young ladies, and three from the Young Ladies' College. Toronto sent 14 boys; Upper Canada College 12 boys; St. Catharines 11, one a lady; Hamilton 8, one a lady. Brantford thus heads the list in sending to Toronto much the larger number who passed the examination. And in analyzing the honor lists, it will be seen that the young ladies come up well in comparison with their brothers. Brantford carried off 10 first-class, and 20 second-class, in all 30. Toronto takes 7 first and 20 second—27; Upper Canada, 4 first and 16 second—20; St. Mary's, 5 first and 13 second—18; Bowmanville, 9 first and 6 second—15; St. Catharines, 4 first and 8 second—12; Hamilton, 2 first and 3 second—5. Of the scholarships, Brantford takes 2, and Hamilton, Toronto, U. C. College, St. Mary's, Bowmanville and Collingwood, one each. —*Brantford Weekly Expositor.*

NOVA SCOTIA.

The Provincial Educational Association convened in its second annual session in the Assembly Hall of the Normal School, Truro, on Wednesday, July 13th. One hundred and seventy-four enrolled members were in attendance while the successive meetings of the association were favoured with a large number of ladies and gentlemen interested in the cause of education.

Dr. Allison Superintendent of Education, in calling the association to order, gave a hearty greeting to the assembled teachers, and confidently bespoke an earnest and critical consideration for the important matters to be submitted.

Alex McKay Esq., Prof. of Mathematics in the Halifax High School, and B. McKittick Esq., B. A. Principal of Sydney Academy, were re-elected to the offices of Secretary and Assistant Secretary.

The report of the Executive Committee was presented, embodying among other matters the programme of exercises for the present meeting, and recommending that ample time be afforded for the discussion of the "Course of Study for the Public Schools" to be presented by the Committee charged with the duty of its preparation.

Principal Calkin as Chairman presented the report of the Committee on the "Course of Study," and made in connection with the presentation a few explanatory remarks. The report was accepted for consideration and laid on the table for subsequent discussion.

Jas. B. Hall, M.A., Ph. D. Professor of English, in the Normal School, read a paper on "Method" the discussion growing out of which lasted till the close of the first session.

The essayist distinguished between the form or husk, and the true vitality of teaching. Our school work was often hampered with paraphernalia, the burning of which would purify the educational atmosphere. He quoted and endorsed the four general rules of Descartes. The subject treated of was brought to a definite application

in the teaching of geography. The intimate relations of political and physical geography were eloquently pointed out.

Inspector McKenzie (District No 10.) expressed himself as much impressed with one prominent idea of Dr. Hall's paper. We should aim at avoiding the enfeeblement of children's minds through over-much breaking up of subjects.

Principal Calkin said that we should consider what is the teacher's aim—words or ideas? The teachers' constant object should be to develop the child's natural desire for knowledge. Objective teaching for the young has a deep philosophical basis. Words are not so plain and gratifying to the young child as are objects. The order of natural development should be observed.

The exercises of the second session began with an illustrative "Miscellaneous School" conducted by teachers of the Model Schools and Pupil Teachers of the Normal School. This exercise deservedly attracted great attention. The pupils were drawn from the Public Schools, and the teachers engaged were Miss Hamilton of the Model School, and Misses Kirkpatrick, Calkin, Hamilton and Fletcher of the Normal School.

The Association then proceeded to discuss the submitted "Course or Study." In passing to this order the President expressed a hope that the report would be thoroughly sifted. Let not action be taken on so important a matter without the fullest and most careful consideration. The questions which should enter discussion, are: 1st Do we need a Course of Study? This is a general question. 2nd Does the proposed course meet our wants? The succeeding discussion was taken part in by Principals Calkin and McKay (Pictou), Inspectors McKenzie and Roscoe, Dr. Hall and Messrs. H. S. Congdon (Maitland), Lay, Tuttle, Crowell, Andrews, and others. Some argued that the "Course" was impracticable for "Miscellaneous Schools," being too heavily weighted with science and oral lessons. Others that many teachers were at present incapable of giving oral lessons effectively. On the other hand it was urged that the elements of scientific knowledge were of paramount importance, and that teachers who were too idle or stupid to teach such lessons as the course required could be well spared from the profession.

At the close of the afternoon's discussion, which was conducted in a most earnest, yet most gentlemanly manner, the President (Dr. Allison) observed that he was not irrevocably wedded to the sciences, but pointed out that it would be impossible to produce a single public school course of any civilized country, published within the last ten years, with less science than the course now before the Association contained. Why should not the study of minerals be imperative in this Province, filled with minerals, as in other countries which did not contain a single mineral? But it was better to be on the safe side; it was better to put too little science in the course, and add to it as advisable, than to overburden it now and prejudice teachers against its practical utility. The argument that the teachers would be unable to instruct their pupils was a very poor one. Carry the argument to its logical conclusion, and what would be the result? We should never take a step forward. We should stay where we are for five thousand years, because a large number of teachers would not be able, and would not be inclined to qualify themselves, to teach any new branches that might be introduced. As educationists we *must go forward!* At the same time we should not make our advancement more difficult than is absolutely necessary.

The third session was held in the Hall of the Y. M. C. A. A large audience assembled to hear an address from the President, on "The Educational Condition and Prospects of Nova Scotia." Principal Calkin presided, and was supported on the platform by many leading educationists. The address epitomized the various forms and forces of education existing or at work in the Province, pointed out defects, suggested improvements, and according to the summarized press reports, for which we are indebted to the *Herald* and *Mail*, closed as follows:

ARE WE USEFULLY EDUCATING THE CHILDREN OF THE COUNTRY?

Generally yes, and emphatically yes, if the comparison be with the past. But let us consider the friendly criticisms which are kindly volunteered from time to time. We are over-educating the people; educating them, or some of them, above their station in life. Is it a crime for a young man to be aspiring and ambitious? Is our system to be condemned because it has afforded many a youth the instruments of attaining to a better destiny? If it trains the young to despise their hard-working parents, or breeds sentiments which tend to overstock the non-productive occupations or professions, its practical working should be carefully watched. But

if we condemn it for fostering the impulse of honourable ambition, we condemn it for doing what all true education must in the nature of things do. Considering the subject in detail, the speaker proceeded to suggest that possibly the criticism referred to could be explained by the almost exclusive attention given in our schools to bookish studies, the Humanities, as Scotch educationists say. He pleaded for a training which would at least let the pupils know that there is a physical world, that it has phenomena and laws, that they themselves are sentient organisms. The question of intermediate education was elaborately treated. He deplored the imperfect articulation with our colleges. The semi-animate University of Halifax held in suspense hopes he and others had entertained that its working would remedy the defect. It was unfortunate that we were to so large an extent shut out from the light and heat of which colleges are the natural centres and sources. The County Academy system was referred to, and suggestions as to its improvement made. The speaker concluded with a reference to our politicians and statesmen, discussing their rival policies of trade and commerce. The teachers should recognize that the determination of the destiny of this country is in *their hands*. Nations which produce great men alone are great. Nations whose people are educated cannot be poor. The dream of continental commerce thundering over this little peninsula to be transported in mighty argosies from its peerless harbours, may be realized or not. If we do our duty, Nova Scotia will be the home of an intelligent and virtuous people, and this includes the promise of everything a reasonable patriotism can desire.

(Next month's notes will contain remainder of report of this interesting educational gathering.—Ed. C. S. J.)

Gordon McGregor, A.M., Ph.D., Munro, Professor of Physics in Dalhousie College, is spending the summer in Edinburgh, pursuing certain scientific investigations, for which the famous university of that city offers special facilities.

The Governors of Dalhousie College have decided that all the facilities and privileges of that institution are available to young women as well as young men. Specially included in this statement are the Munro Bursaries and Scholarships. It is understood that one of the young ladies, whose application secured the above response, is Miss Calkin, daughter of the esteemed Principal of the Normal School. Miss C. stood third in the list of candidates for Licenses of the First Class at the Annual Examinations of 1880.

A large meeting of representative educationists met in the Legislative Library, Halifax, for the formation of a University Consolidation Association. Addresses were delivered by the Rev. Chancellor Hill, who presided, Wallace Graham, Esq., A.M. (Acadia), R. C. Weldon, Esq., A.M., Ph.D. (Mount Allison), and others. His Hon. Ex-Judge Wilkins, was chosen President, and C. B. Bullock, Esq., A.B. (King's), Secretary of the newly-formed Association.

MANITOBA.

The corner stone of the new Manitoba College was laid by His Excellency, the Governor General, during his stay here. His Excellency visited all the Colleges, the Governing Bodies of which presented addresses to him. An address was also presented by the Council of the University.

St. John's College School, and St. John's College Ladies' School, have re-opened after the vacation with an increased attendance in each case.

The Protestant Board of School Trustees for Winnipeg are advertising for five teachers. Mrs. Chisholm, who for some years has done excellent work as a teacher here, has just resigned. The total number will now be fifteen.

At the examination for Public School Teachers, which commenced on the 2nd of August last, there were ninety-two candidates. Of these eleven wrote for First-class Certificates, forty-one for Second, and thirty-eight for Third; and two undergraduates of the University of Manitoba, who have passed the previous examination of said University, took the paper on school organization and management.

The following is the classification of the successful candidates, the names appearing in the order of merit, viz.:

FIRST-CLASS.

GRADE B.—A. Springer, Miss Aggie Eyres, John D. Hunt, E. A. Flakeley, D. E. McLean, P. D. McKinnon, John A. McGuire, Miss Nellie Brown.

SECOND-CLASS.

GRADE A. A. Carnichael, Miss Annie Morrison, W. C. Morrison.

GRADE B. N. Howitt, J. Martin, T. B. Scott, Miss A. Dickson, J. W. McPhail, D. Campbell, R. Weir, Miss J. Hargrave, Alex. Acheson, Miss Hetherington, James Patterson, John Acheson, A. R. Shirk, Francis Shore, Miss Sturgeon, Miss Aikenhead, Miss F. Burko, Miss Mellroy and A. W. Stock, equal; A. Montgomery, W. Duncan, S. Erskine, Miss Tina Allan, J. Barkley, F. F. Korr, Miss M. Hargrave, J. C. Fraser, W. C. Graham, Miss Simpson, Montague Shore, Miss Jennie Ager, John May.

Undergraduate passmen are, John Mulvey, Manitoba College; J. B. D. Code, Manitoba College.

THIRD-CLASS.

GRADE A. A. C. O'Brien, H. N. Hill.

GRADE B.—A. L. Mcintosh, T. H. Loughhead, George McRao, J. H. Copeland, A. H. Monkman, R. J. Lipsitt, Miss Hopper, Miss Blyth, John J. Edwards, M. Babington and H. A. Stewart, equal, F. N. Shultz and W. Kinstead equal; Miss McDonald, R. W. Simpson, D. W. McKercher and John Clinton, equal, Miss Harvie, H. Newmarch, E. Montgomery, William Eccles, Miss McKibbin, Miss Robb, J. W. Daly, Miss J. Hay Aitken, T. H. Milne, Miss Conner, Miss Mary Allen, W. C. Pope, Miss Edwards, Miss Johnson, Miss Parrott, Mrs. Gosnell, R. R. Mills.

The Rev. W. C. Pinkham, B.D., has just resigned the incumbency of St. James, a position he has held for nearly thirteen years, and the duties of which he has for the past ten years discharged in addition to his duties as Superintendent of Education.

A. M. Sutherland, B.A., M.P.P., has been obliged to resign the Inspectorship of Public Schools for the County of Segeur, owing to pressure of private business.

RECITATION BEFORE RECESS

Now soon the bell will ring
To call us out to play;
You can not tell how hard it is,
Still in our seats to stay.

We'd rather run and jump,
Play with our ball and bat,
Or swing, or spin a humming-top,
Or gaily laugh and chat.

We try to study well,
And not be idle seen;
We write and cipher, read and spell,
And sing our songs between.

We know that birds and bees
Are busy all the day,
Although we think, if we were those,
Our work would seem but play.

It takes so long to learn
All that we ought to know,
But teacher says we'll need it all
When we shall older grow.

So we will do our work
With bright and cheerful face,
And you'll soon see us back again,
Each busy in our place.

Readings and Recitations.

A BOY'S ESSAY ON BOARDS.

There are several kinds of boards—sign boards, base-boards, dash-boards, flap-boards, side boards, paste-boards, and school-boards. I think I will write about school-boards, because my sister is a teacher, and I can remember a good many things she has said about them, and that will help me some.

I don't know whether school-boards are always made of green lumber or not. I heard my sister say the board wasn't half baked once. Guess she meant it wasn't kiln-dried. May be it warped, and turned over on the wrong side, or may be it shrunk badly, when exposed to the dry question of wages.

School boards are of different shapes, some are square and polished on both sides—some are longer than they are broad, and so thin they bend under slight pressure.

I asked my sister what kind of a board ours was, and she said it was a good looking board, but when put to any use it was full of splinters.

There was a young lady staying with my sister, the evening I was writing this, and she said she thought some of the board would make good hitching-posts. I asked her if it was because they were such big sticks. She said that wasn't it. Then they both laughed, they thought I didn't know what they meant, but I did, because I saw Mr. Jones take her to church, and he is a member of the board, and she acted as if she thought he would be good to tie to.

The school board is used for the purpose of getting the cheapest teachers they can find, whether they know anything or not, and to vote down women's wages, and leave men's as they are. This kind of board is elected by the people, mostly men.

They most always get the closest-grained they can find: then when the teachers say they don't get pay enough, the people say it is the board. The teachers say the people had no right to get such hard wood for their board, and the board say "what are you going to do about it?"

Sometimes there is a weak place in the board, and when thrown against some hard question it splits and goes all to pieces, then they either get a new one or stick the old pieces together again with taffy.

My sister says there is too much slang in this, but father says slang is mighty and shall prevail. He knows, because he is a man. Men know everything, because they can vote.

Sometime, I will write about other kinds of boards, if you haven't been too badly bored with this.—*Literary Notes (Neb.)*

Teachers' Associations.

The publishers of the JOURNAL will be obliged to Inspectors and Secretaries of Teachers' Associations if they will send for publication programmes of meetings to be held, and brief accounts of meetings held.

ONTARIO TEACHERS' ASSOCIATION

The proceedings of the twenty-first Annual Convention of this body were opened with devotional exercises in the Large Hall, Education Department, at 10.45 a.m., on the 9th ult., the President, Mr. Robert Alexander, of Galt, in the chair. The minutes of last meeting were accepted as read, and the Treasurer, Mr. F. S. Spence, Toronto, read his report which showed a balance on hand of \$183.76. The statement was handed to an audit committee to report. On the proposition of Mr. J. L. Hughes, P. S. I., Toronto, seconded by Mr. R. W. Doan, Toronto, Mr. W. H. G. Colles, of Chatham, was appointed minute secretary. After a few questions relative to order of business, the Convention adjourned until 2 p.m. to give the committees and sections an opportunity of meeting. At 2 p.m., Mr. Hughes read the report of the Committee on Legislation, in which the superannuation scheme bore a leading part. The Committee also reported that they strongly urged the withdrawal of the amendment of 1879 restricting the powers of school boards in providing school accommodation, and a clause was drafted giving the Board the right of appeal to the Minister of Education if their estimates were not granted, and authorizing him to compel the section or municipality to raise the necessary funds, if on enquiry no found the school accommodation to be insufficient. The clause, the Committee regretted, was not embodied in the Bill submitted to the House. They recommended that the views of the Association should be expressed. The necessity for granting increased aid of County Model Schools was also pressed upon the attention of the Minister. The amount of the government grant had been increased to \$150 per annum, and the county grant to an equal amount had been made compulsory. The Committee reported that they had been received by the Minister of Education with the greatest courtesy, that he had promised to recommend an annual grant of \$200 to assist the Association, and to incorporate the proceedings of the Convention in his annual report. Mr. Hughes moved the reception of the report, seconded by Mr. Fotheringham, P. S. I., Aurora, and carried. Mr. Mackintosh proposed a vote of thanks to the Committee for their trouble, zeal and patience in the execution of their onerous and responsible duties, so satisfactorily performed, seconded by Mr. P. C. McGregor, and passed with applause. The consideration of the superannuation scheme, as given in the circular of the Minister of Education, was then taken up *seriatim*. Mr. Hughes proposed the adoption of clause 1, seconded by Mr. Campbell, Ottawa; and carried. Mr. Fotheringham moved the adoption of clause 2, seconded by Mr. Wood; carried. After some discussion about reserving future consideration of the circular for a larger attendance, it was determined, on Mr. Fotheringham's motion, to proceed. Mr. Campbell moved, seconded by Mr. Kent, that clause 3 be adopted. Mr. Hughes moved as an amendment the plan adopted by the Toronto Association which he represented, namely, "that each person contribute annually to the fund the sum of \$4, with

the option of increasing that amount by contributions of 4, 8, 12, or 10 dollars." This would enable the teacher who had a small salary to provide a sufficiency equal to those more fortunate, and thus secure a better provision for old age. Seconded by Mr. McGregor, President, No. 1, Leeds County. Mr. Campbell opposed such an arrangement on the plea that teachers when superannuated would, in many instances, be better off than when they were teaching. Mr. Henderson, Thornbury, said East Grey Association did not approve of the sliding scale. Mr. Reid spoke at some length on the object of such a fund which he thought should be considered in a charitable sense, and moved an amendment to the amendment that the payment be voluntary. Mr. Mackintosh, who was in favour of the Toronto plan, altered his opinion on hearing what Mr. Campbell said. He would support clause 2 as in the circular. Mr. White, of Watford, was also against Mr. Hughes's amendment. Mr. F. S. Spence said that the Hon. Adam Crooks was decidedly in favour of the sliding scale, and not in accordance with the percentage system which would cause much difficulty. The circular did not express the views of either the Minister of Education or the Legislative Council. The best men did not often get the best salaries, and in the country the trustees are so good, just and virtuous that they give salaries according to efficiency; it might be different in the city and the percentage system would be unfair. He could not see how a man could retro on a larger salary than he received while teaching, but if the amendment became law good men would be encouraged to remain in the profession and indifferent ones would leave it. The reasons which induced him to favour the sliding scale were four, as follows:—(1) because it gave the provident man a chance to provide, and not simply a certain paltry amount; (2) because the man who enters the profession will know for certain the sum he will receive on retirement; (3) because it was easy to manage; (4) because it gave no discrimination to those receiving large salaries, but placed all upon an equal footing. Mr. A. S. McGregor, South Perth, would prefer a settled and fixed annual sum, but failing that he favoured the sliding scale. The motions were then put to the Convention, the amendment to the amendment being lost, only three voting for it. Mr. Hughes, in reply to an enquiry, explained how the scheme he proposed in his amendment would work. Under it a teacher would be entitled to five-sixths of the total amount he had paid. If a teacher paid \$8 per annum for thirty years, five-sixths of that would be \$200, the amount he would receive. So that his income from the fund would depend on the amount he had paid in and the number of years he had taught, and not on the amount of his salary. Mr. Hughes's amendment was then put and carried by a large majority. (At this stage the further discussion of the subject was stopped to proceed with the programme, but as it may be more convenient to our readers to have all in connection with it given continuously as it came on at the several sessions we proceed to do so.) Clause 4 reads as follows:—"Every male teacher of a public school is required to make such payments annually into the fund during the period or periods in which he is engaged in teaching. There was considerable discussion over this clause. The general opinion appeared to be that if the payments were made compulsory in the case of one class, it should be so in the case of all. At length a motion was carried providing that all those who were entitled to contribute under clause 2 should be compelled to contribute under clause 4. On motion of Mr. Campbell clause 4 was amended so as to read "all persons enumerated in clause 2 as entitled to a retiring allowance shall be required to comply with the conditions attached during the period of their service." This settled the question in favour of no exemptions. Clauses Nos. 5 and 6 were, on motion, struck out, and clause No. 7 amended by having the words "at the rate of two per cent. upon the salary of each person and the said sum of two dollars also to be annually paid by non-contributors, as hereinbefore provided," struck out. Clause No. 8 was adopted. The discussion on clause No. 9 caused a lively debate, after which the first section of the clause was amended and passed. The second section was also passed. The remaining clauses were then agreed upon, with a change in clause 11, as follows:—"That no contributions should be returned, but that after two years, in case of disability or death, the funds should be given to the party, his relatives or representatives." In continuation of the programme, an able paper on "Agricultural Education in Schools" was read by Prof. J. Mills, Principal of the Agricultural College, Guelph, who admitted that the children of Canadian public schools were more proficient than those in other countries in arithmetic, geography, history, &c., but thought they were not so well up in composition, reading and spelling, because in his opinion the teachers either did not give sufficient attention to these subjects or were not themselves proficient enough to teach them. He looked upon good reading and correct spelling as of primary importance, and suggested that the Normal Schools should include on their staff the best teacher of elocution they could get. Prof. D. C. Bell's appointment to the Toronto Normal School was a step in the right direction. Geography received too much attention, while more practical subjects, such as botany, geology, and elementary chemistry were neglected. The agricultural resources of Ontario are gradually decreasing, not through the soil becoming exhausted, but through the lack of scientific skill in cultivating it. Prof. Mills thought that agriculture should be included in school studies, to give children an idea of how the soil ought to be managed, so as to produce

larger yields without becoming impoverished. This information could only be imparted legitimately in the public schools, and primers on the subject might be put into the hands of the children. Teachers should receive a course of instruction in that branch at the Normal Schools; and an incentive to study would be afforded by the Agricultural and Arts Association, who intend to hold examinations on agriculture and stock-raising periodically throughout the Province, and grant certificates. Mr. Wm Johnston, by request, spoke at some length on the importance of learning Agriculture, and the desirability of its introduction into the public schools, but he feared that as the programme of school work had a restricting influence, and embraced only technical subjects, which aimed in the direction of some practical pursuits, there was no room at present for such a useful and necessary study as that of agriculture. A resolution in favour of introducing a course of instruction in that branch, into the public schools, was lost. In the evening the President delivered a highly instructive and practical address bearing upon the "Galt half-time system; the use of hair-line type in reading books for letters which are not sounded in the words, and the ventilation of school rooms. A mere summary of the address would be very unsatisfactory, and could not do justice to the many excellent ideas brought out; but we may be able to publish it in full in a future number of the JOURNAL. Second Day.—The public school section met at 9 a.m., and took up the subject, "Our Over-supply of Teachers," which was introduced by Mr. McAllister, Toronto, who referred to the fact that a large number of applicants appeared for such situations as gave a salary of not more than \$300 per year. This arose from the ease with which the profession was entered by those who intended to remain in it for a year or two only. He thought the training in Model Schools too short, and that young persons who had little or no experience should act as assistant teachers for at least twelve months before being entrusted with the full management of a school. A considerable discussion ensued in which the following took part: Messrs. Duncan, Wightman, Powell, Colles, Miller, Linton, White, Black, Rothwell, Campbell, Lewis, Alexander, Spence, Harvey, Henstridge, Bole, Dufoe, and Bowman. Mr. Campbell of Ottawa, thought third-class teachers should not have full management. Mr. Lewis, Toronto, was of opinion that too much importance was given to certificates instead of to experience and success in teaching. Passing an examination did not qualify a person to teach, it would answer as well for any other profession; but while the standard of certificates was taken, the teaching profession would be constantly filled by those who only intended to make it a stepping-stone to other positions. Mr. Alexander contended that there should be no grades among teachers, the standard should be success; other professions had no such grades. Mr. W. Rennie, Newmarket, then moved, F. S. Spence, Toronto, seconded, and it was carried, "That Messrs. Alexander, McAllister, Lewis, Colles, and Wood be a committee to draft a resolution embodying the ideas of the section on the subject of over-supply, to the Minister of Education, said committee to report to this section to-morrow morning." After hearing Mr. McQueen's paper on "Representation to Provincial Association," which was read by Mr. Smith, P.S.I., Wentworth, the following resolution, proposed by Mr. Spence, and seconded by Mr. R. W. Doan was adopted:—"That each local association be entitled to three delegates who shall be full members of this association; that any teacher or inspector may be a privileged member on payment of fifty cents, such privileged member to be entitled to all the privileges of this association, except voting at the election of officers, or when the yeas or nays are called; and for purposes of representation the section shall be considered a local association." The Convention resumed at 2 p.m., Mr. Alexander, President, in the chair. Mr. A. H. Morrison, Galt, read a paper on "Physical Education," which we publish in our columns. A vote of thanks to Mr. Morrison was moved by Mr. Reid, Mount Forest, seconded by Mr. Scarlett, P.S.I., and carried with acclamation. Mr. J. L. Hughes, P.S.I., Toronto, then gave an extremely practical address on "Industrial Drawing," as taught in the public schools of Toronto. He said that teachers considered this subject could only be taught by a Drawing Master, but he would show that it was within the scope of every teacher to give instruction in it, if that individual's mind was cleared of three popular fallacies, namely: (1) That pupils cannot learn to draw; (2) That all teachers cannot learn drawing; (3) That in teaching drawing we should educate the hand. He then clearly showed how a teacher might commence the art with even very young pupils, by drawing a regular figure such as a square, and sub-dividing it into squares.—thus teaching on the square. (laughter). These figures could be filled in always remembering that what was drawn on one side should be similarly performed on the other side of the centre. He cut a pattern from a maple leaf and illustrated how that, or any similar pattern might be utilized on the same principle. He referred to some specimens of work performed by the children of the Toronto Public Schools, which were exhibited in the Entrance Hall of the Education Department, as evidence of what might be done by this system; and we may here remark that, considering the ages of the juvenile artists, the specimens we saw were, in many instances, extremely well executed, and we could scarcely credit the assertion that they were original designs—but such is the fact. Mr. Linton, Galt, said he knew nothing of the subject until he heard Mr. Hughes give an address on it at a convention in Waterloo County. He

afterwards tried it in his school, and it has proved a perfect success. Mr. Duncan proposed that the thanks of the Convention be given to Mr. Hughes for his very useful and instructive address; seconded by Rev. Mr. McKee, and carried unanimously. In the evening a very able address was given by Dr. Workman, of Toronto, on "The Morbid Results of Persistent Overwork." To summarize this address would be to spoil it, as all through it was intensely interesting, and most valuable in its ideas and suggestions. *Third Day.*—The sections met at 9 a.m. The general business of the High School Section is summarized in our editorial department. The first business before the Public School Section was the report of Committee on over supply of teachers, which was to the effect that, teachers should have their certificates raised according to their practical success in teaching. The following officers were then elected. Chairman—Mr. Lewis; Secretary—Mr. Rammie, re-elected. Members of the General Committee—Messrs. Campbell, McAllister, Alexander, and Colles; from the Inspectors' Section, Mr. Mackintosh; Members of the Legislative Committee—Messrs. McAllister, Doan, and Spence, re-elected. A vote of thanks was tendered to the retiring officers. Mr. J. Duncan, Windsor, then read a paper on "Model Schools, and Model School Work," which will appear in a future number of the JOURNAL. In the P. S. Inspectors' Section, the officers were elected as follows: Chairman—J. S. Carson, Strathroy; Secretary—D. A. Maxwell, Amherstburg; Directors—J. L. Hughes, Toronto; J. Dearness, London; D. Fotheringham, Aurora; E. Scarlett, Cobourg; Legislative Committee—J. L. Hughes, Toronto; J. S. Carson, Strathroy; D. Fotheringham, Aurora. The following resolution was passed:—"Resolved, That in the opinion of this Section the professional training of first and second-class teachers is quite defective, and the attention of the Hon. the Minister of Education is respectfully directed to the necessity of a thorough investigation into the character of the lectures delivered in the Normal Schools, and into the method of teaching practised in the Model Schools." Mr. Dearness introduced the subject "A Day's Work in School." A general and profitable discussion ensued on the subject, and the meeting adjourned. At 2 p.m. the Convention resumed, and the officers for the ensuing year, nominated by the Board of Directors, were declared duly elected, namely: President—Mr. A. McMurchy. Vice-Presidents—Messrs. J. S. Carson, D. C. McHenry, and R. Lewis; Recording Secretary—Mr. R. W. Doan; Corresponding Secretary—Mr. A. Purslow; Treasurer—Mr. F. S. Spence. The report of the Auditors, testifying to the extreme accuracy of the Treasurer's books, was read and adopted. The following resolutions were carried unanimously:—Moved by Mr. J. L. Hughes, according to notice previously given, seconded by Mr. Maxwell, "That, in the opinion of this Association, the minimum age for admission to Public Schools should be increased from five to seven years, or, if this change be not made, that students at the Normal Schools should receive training in the principles and practice of Kindergarten work." Moved by Mr. J. L. Hughes, seconded by Mr. A. S. McGregor, "That, in the opinion of this Association, the 29th clause of the Amended School Act of 1879 should be rescinded, or so amended as to place no restrictions on School Boards in providing additional school accommodation where the existing accommodation is insufficient." A resolution, moved by Mr. R. W. Doan, providing for the paying of the Director's travelling expenses was also passed. In consequence of the unavoidable absence of Rev. Dr. Wilson, his paper on "Religious Instruction in Public Schools," was read by Mr. J. M. Buchan, M.A., H.S.I., and at its conclusion, Mr. A. McMurchy moved a vote of thanks to Dr. Wilson, for his able paper, which was seconded in eloquent language by Mr. Lewis, and carried unanimously. A cordial vote of thanks was also tendered to Mr. Buchan, for his admirable reading of Dr. Wilson's paper. The Committee on Hygiene presented a report to the following effect, which was adopted. First, that the Hon. the Minister of Education be requested to issue to the school sections circulars setting forth the best modes of ventilation, etc., with a view to making it obligatory on the part of trustees when building school-houses to arrange the hygiene, second, that a committee be appointed to consider the best methods of experimental education. Mr. S. S. Hermer, President of the Waterloo Co. Association, read an exhaustive paper on "Uniformity of Text Books," which was well received. In the evening, Dr. S. P. Robins, of Montreal, delivered a splendid lecture on "The Relation of the Will to the Intellect," and at its close received the hearty thanks of the Association. On motion, the name of the body was altered to "The Ontario Teachers' Association." Resolutions of thanks were passed to the Toronto daily press, and to the passenger agents of the various rail ways; also to the Minister of Education for allowing the Association the use of the beautiful Hall of the Education Department, after which the Association was closed by singing the National Anthem.

REVIEWS.

DICTIONARY OF EDUCATION AND INSTRUCTION. *New York, E. Steiger.* Mr. Steiger published, about four years ago, *The Cyclopaedia of Education*, edited by Messrs. Kiddle & Schenck, two of the New York School Superintendents. The present work is an abbreviation of the larger volume, made by omitting matter of only occasional interest and value

to the professional teacher, and contains solely what is of every-day need, which may be obtained at a moderate cost, and yet supply a large amount of information on a great variety of subjects, such as could be obtained only with considerable difficulty from large and expensive works. The arrangement of Subheads in the longer articles greatly facilitates the use of the book. It should be in every teacher's library.

POINTS OF HISTORY, by John Lothrop Motley. *New York, A. S. Barnes & Co.* This book gives in "question and answer" style, the chief facts in the history of the world. Little attention is given to Ancient history, and special prominence is given to England. The author shows good judgment in giving events more in detail during the present century. It could not supplant other histories, but would enable one to review history fairly.

MAGAZINES.

September number of the *Atlantic Monthly*. Contents.—Dr. Breen's Practice; Chapters IV.—VI., W. D. Howells; "Koschel, the Beardless, or the Diffusion of Fairy Tales," by John Fiske; "Harvest Noon," Edith M. Thomas; "In Exile," Part II., Mary Halleck Foote; "Housekeeping Hereafter," J. V. Sears; "The Portrait of a Lady," Chapters XLIII.—XLVI., Henry James, Jr.; "Post Prandial, Phi Beta Kappa, 1881," Oliver Wendell Holmes; "The Katrine Sagar," Part I., H. H.; "The Future of Harvard Divinity School," William Chauncey Langton; "The Dramas of the Elder Dumas," J. Brander Matthews; "The Attempt on the President's Life," E. L. Godkin; "Mr. Howell's New Book," "The Rise and Fall of the Confederate Government," "Some Recent Biographies," "The English Colonies in America," "Transcendental Physics," The Contributors' Club; Books of the Month.

THE POPULAR SCIENCE MONTHLY. It is doubtful if for fifty cents any other volume could be purchased containing so varied and so instructive information as the September number of this magazine. Herbert Spencer's "Political Institutions," and Dr. Felix Oswald's "Physical Education" are continued. A very able reply is given in the article of Honorable Auberon Herbert on "State Education: a Help or a Hindrance?" "The Progress of Higher Science Teaching" criticises the introduction of too much of the "mathematical conundrum" work into Science teaching. One of the best papers is the concluding part of the article on the Circulation of the Blood. There are besides these, "Ancient Copper Mines of Isle Royale," "Writing Physiologically Considered," "Modern Basis of Life Insurance," "Measures of Length," "Are Centuries Unhealthy?" "Inheritance," "The Australian Aborigines," "Unexplored Parts of the Old World, What is a Molecule?" Sketch of James Craig Watson, and Editorial. It is one of the best numbers yet issued.

SCIENCE'S MONTHLY MAGAZINE. The Stories and Editorial Departments are choice and ably conducted, as usual. The three leading illustrated articles are, "The Society of Decorative Art," "The Coniferous Forests of the Sierra Nevada," and "The Wheel as a Symbol of Religion." The first describes the recent exhibition of the American Art Society, and contains 22 illustrations. It will prove of more suggestive benefit to our students than many of the works on the subject.

HARPER'S MONTHLY MAGAZINE. The perfection of attractive arrangement recently have been reached in the September Harper. Poetry and pictures, history and travel, story and song are most charmingly grouped. One can almost feel in reading it that he is enjoying the real delights of the English Brighton with the pictured beauties he meets on the pages, or rowing and fishing in the Thousand Islands, with the other articles of the magazine thrown in, to read on the beach, or under the shade tree. Few who begin it will care to leave it till finished.

HARPER'S WEEKLY continues the tales "The Beautiful Wretch," "Christowell," and "A Fight for Hire." "How to Bathe," in the number for August 6th, gives some valuable hints. Every teacher should read it. The caricatures and drawings are good. Teachers could find much in this journal to interest and improve their pupils.

Publishers' Department.

There is hardly a literary man in America whose writings have been more widely read than those of Dr. J. G. Holland, nor one whose name is better known among the people. It is said that nearly 600,000 copies of his books have been sold, to say nothing of the enormous sale each month of *Scribner's Monthly*, over which he presides as Editor-in-chief. The Century Co., publishers of *Scribner's* (to be known as "*The Century Magazine*" after October), will soon issue a portrait of Dr. Holland, which is said to be a remarkably fine likeness; it is the photograph of a life-size crayon-drawing of the head and shoulders, recently made by Wyatt Eaton, and will be about the size of the original picture. It is to be offered in connection with subscriptions to *The Century Magazine*.