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# The Canada School Journal.

Vol. VII.

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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.

## TRADE ORGANISM AND POLITICAL PARTISANSHIP.

The rumored approach of a general election for the Province of Ontario has called forth a more than usually atrabilious outpouring from that petulant and egotistical scold, yclept the *Educational Monthly*. That we have attributed the comments in its July August number to the correct cause is apparent from internal evidence, but we have not to depend on this testimony alone. Those who are engaged in converting the attacks on the Education Department into a partisan political crusade have not even sense enough to keep their mouths shut while their pens are in operation. They have always "talked" and "talked," until giving themselves and their fellow-conspirators away has become a matter of common occurrence. During the recent provincial convention it was publicly stated by one speaker that the *Educational Monthly* was, according to the boasts of its conductors, to indicate the line of attack on the Government and "form one of the first elements in the coming campaign," and his statement was allowed to go uncontradicted.

We appeal to fair minded educationists all over the province whether this is the proper course for a journal pretending to be educational to pursue, and whether an alleged "educational" journal pursuing such a course is worthy of their support. There are thousands of teachers and trustees utterly averse to seeing our noble educational system made a party football, and these, without reference to party predilections or associations, will frown down any attempt that is fraught with such danger to the highest interests of the public.

While we do not consider our educational system perfect and are often compelled to differ from the Minister on matters of policy, there can be no doubt that the system itself is an admirable one and that in the main the changes made from time to time are in the right direction. But what opinion of both the system and the mode of administering it, would a foreigner from

reading only the *Monthly* entertain? He would come to the conclusion that the cultured and courteous gentleman who presides over the Department is a born fool at once incorrigible and corrupt. That this language is not too strong can easily be shown from the pen-and-ink sketch of him in the *Monthly*. He "has no command of the resources of a great public man;" he is "anomalously compounded of capriciousness and political partisanship;" "it is not unreasonable to look with apprehension upon any organic change in the Departmental Regulations he may wish to originate;" "his knowledge of the working of our school system is derived at second hand," some of his proposed amendments "commend themselves to common sense," but for these he deserves no credit, as he took the ideas without credit from the *Monthly*, "in the proposed regulations nothing original is good and nothing good is original;" he is "dominated by his official importance," and his volition is "controlled by political bias or professional intrigue;" he is too much given to "dalliance with the affairs of his office," and when he becomes active he displays "an unhappy proneness to mixing and muddling, with the occasional accessory of a scandal;" "his regulations are persistently ignored by his subordinates who trust for immunity to personal and political influence or to their master's well known inaptitude," he is "wanting in sensitiveness of apprehension," and is lacking in "sympathy with the teacher and his work;" his connection with our school system "clogs and discredits it," and the official correspondence of the Department is a "record of weakness and vacillation," "his wordy flatulence is only equalled by his pretentious ignorance," and "his political partizanship is a public scandal," "the Department can command neither confidence nor respect, and the whole system suffers with it," he is not "of course entirely responsible for the low tone of the profession"—rather hard on the profession—"or for the laches of idle youths who under the pressure of the intermediate would rather prig than cram, but he cannot be entirely absolved "while his partizan administration continually enfeebles the sense of honor and of responsibility throughout the schools, and while his intellectual indigence and infirm executive make bureaucracy a laughing stock and centralization a scorn," he ought to give way to some one who "could direct our school machinery with impartiality and judgment;" at present "the business of the Department" is not "properly attended to," and "favoritism is shown where favoritism is vicious."

We will not do those who indulge in such comments the injustice of imputing to them any belief in what they are saying. This mode of writing is due partly to the force of confirmed habit, as in the case of Mrs. Caudle or Mr. Spoopendyke, and partly to a deliberate intention to secure a change of Departmental management by a change of Government. To describe the language as unbecoming would be to praise it; such an outflowing of venom would disgrace the ordinary political journals who, however they may have to differ from Mr. Crooks, at least treat him, as he invariably treats his oppon-

ents, with courtesy. Matters have come to a hard pass when either trade jealousy or personal disappointment can drive a professed educationist into setting other journalists so pernicious an example.

The reference to the *SCHOOL JOURNAL* in the same article is of a piece with dozens of references of the same kind. This journal is not the "trade organ" of the publishers and we have no hesitation in appealing to our editorial and news columns for confirmation of this assertion. The publishers of the *School Journal*, except when compelled in self-defence to violate this rule, have studiously refrained from making use of any but its advertising columns in which to make their business announcements, and these columns are as open to other publishers wishing to advertise as they are to the publishers of the *Journal*.

So much cannot with truth be said of the *Educational Monthly* which has been persistently made the "trade organ" of its publishers, and especially of the Campbells' publishing establishments, in one of which the editor of the *Monthly* is at present an employee. By its highly commendatory notices of books published by that part of the trade for which it speaks, and its ludicrously unjust criticisms of all others of the same class it proclaims that it has no other function than that of a "trade organ" except the one already referred to of political hack. Any apparent exceptions to its ordinary practice are easily seen to have been prompted by a sinister purpose. For instance in its July-August number the *Monthly* gave a favorable notice of Macoun and Spotton's "Botany," a work which has been before the public for three years. They could afford to do this from the trade point of view since none of the publishers interested in the *Monthly* have, or are likely to have, any rival to that admirable manual, and by this cheap praise the conductors put themselves in a position to say that they do not invariably condemn books not published by themselves. The *Monthly's* editorial puffs of its own editor—a man whose sole qualification for his present position is that he has proved a failure at everything else—are beneath contempt.

#### UPPER CANADA COLLEGE.

At a recent meeting of the Senate of the University of Toronto a communication was received from the Minister of Education enclosing a report by Principal Buchan of Upper Canada College. In that report he recommended that the services of two of his colleagues, Messrs. Wedd and Brown, should be dispensed with, assigning as a reason that they were not able to maintain sufficiently good order in the class-room. Mr. Buchan must have known, when he was contemplating such action as this, that he would raise a storm if he ventured to do as he has done. That he persisted in what he conceived to be his duty in the premises speaks volumes for his moral courage, whatever the merits of the case as between him and the other members of the staff may be.

Attempts have been made in certain quarters to make it appear that Mr. Buchan has been actuated by other than honorable

motives in what he has done, and that it is not his colleagues but himself who lacks the capacity to maintain a high state of discipline amongst the pupils. We venture to say that this is a point on which those who talk so glibly are quite incapable of forming any intelligent opinion. It is inconceivable that a new Principal should be anxious to get rid of veteran assistants without a strong conviction that their presence had become a source of weakness to the institution. Who is to judge between him and them? Is any opinion on the matter entitled to a moment's consideration which is not based on weeks or months of close observation? And why should the professed friends of the institution seek to injure it by weakening the hands of the Principal at a most critical period of its history?

We fully agree with the suggestion that the dismissed teachers—if they have really been dismissed—should not be sent out without adequate pecuniary provision for the future. They are dismissed with the brand of incapacity stamped upon them and this at a time of life when age alone would have formed a serious obstacle to a change of occupation. It is evident now that either Mr. Buchan or his two assistants must go, and in such a crisis the Minister of Education must stand by the Principal. To decline to act upon his recommendation would be tantamount to dismissing him, and this the authorities could do only after satisfying themselves that his management had proved a failure.

Mr. Buchan has been condemned for consenting to take the Principalship after having some years ago participated in a crusade against the very existence of Upper Canada College. This kind of criticism is utterly absurd. By assuming his present position he does not necessarily declare that he has changed his opinions about the expediency of maintaining the College, and it must be permitted to him to alter his views as the result of experience. For some years past, as high school inspector, he has occupied the position of a salaried servant of the whole Province, and when, on the occurrence of a vacancy in the Principalship he was asked to undertake its duties a belief in the inexpediency of maintaining the institution would have been no reason for refusing. His duty is to make it a success if he can, and those who know Mr. Buchan best will most readily and implicitly believe that when he undertook the task imposed on him he did it in perfect good faith.

#### SCHOOL READERS.

The Minister of Education has intimated to the various publishers who are engaged in the preparation of school readers; that he expects to have all the competing series before him by the 15th of September. At furthest, then, it cannot be more than a very few weeks till he is in a position to announce to the public which series he intends to authorize. Those who are engaged in the sale of the old readers should govern themselves by this intimation and take care that when the change goes into effect they are caught with as small a stock as possible.

## ONTARIO ABROAD.

While paid scribes are misrepresenting Gage's Canadian Readers at home the books are meeting with kindly reception abroad as the following paragraph from the *Toronto Mail* of August 25th will show:—

It is a matter of some public interest here to learn that Ontario educational influence is felt in other countries. Messrs. W. J. Gage & Co., of this city, have just received a large order for their new series of Canadian Readers, which are to be introduced into the schools of Bermuda. The same firm were a short time ago favoured with a similar order from Bombay.

The *Educational Monthly* in its August number speaks of "one or two of the collegiate institutes whose masters have not had a proper regard for the dignity of their profession or the rights of other institutions." We are glad to see our neighbour's eyes opened at last to the discreditable character of the tactics which it thus euphemistically condemns. They would have been opened sooner had the worst offenders not been interested in the *Monthly* as stockholders and editorial writers. Better late than never; but how is even this incidental censure of the black sheep of the flock by their white brother to be accounted for? Has there been a falling out? Is the house to be henceforth divided against itself? One prominent member at least of the *Monthly* staff and company has good reason to complain, for he is plainly pointed to now, long after he has, acting on the kindly advice of the *SCHOOL JOURNAL*, ceased to offend. But whatever the motive of the *expose* we welcome it as an indication that even the *Monthly* has found the spirit of professional etiquette amongst teachers too strong to be ignored.

We publish this month the new Departmental regulations relating to public and high schools, and also the public school programme. The importance of the changes made is our best justification for giving up to them so much of our space.

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### Geographical Notes.

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#### THE BOUNDARIES OF ONTARIO.

It is not our purpose in this paper to take any side in the dispute which has been carried on for ten years between the Dominion and Ontario Governments over the precise location of the northern and western boundaries of this Province. That dispute is still unsettled, but even at this stage there are some points of geographical interest connected with it; and as the sources of information with respect to them are not accessible to all teachers, it may prove useful to some to have the essential facts in a compendious and permanent form.

About the location of the boundary between Ontario and Quebec there is no dispute. It coincides with a line commencing on the north shore of the St. Lawrence at Longueuil, a few miles above the mouth of the Ottawa, and running across the peninsula until it strikes the south shore of the latter about the same distance above its junction with the St. Lawrence. The triangle thus cut off includes the two Quebec counties of Soulanges and Vaudrouil. The line then runs up the Ottawa to Lake Temiscaming, and thence due north to James Bay.

It will be convenient at this point to introduce the description of the northern and westerly boundaries as defined in 1878 by the arbitrators chosen to settle the dispute between Ontario and the Dominion, namely, Sir Edward Thornton, Sir Francis Hincks, and the late Chief Justice Harrison. Commencing at the point where the meridian of Lake Temiscaming strikes James' Bay, the northern boundary is made to run along the coast westward to the mouth of the Albany river; thence up that river to its source at the head of Lake St. Joseph; thence by the shortest line to the easterly end of Lake St. Louis; and thence down that lake and the English river to the point where the latter is intersected by a line drawn due north from the northwest angle of the Lake of the Woods, which last named line forms the western boundary. As no line due north from the angle has ever been surveyed, the award of the arbitrators provides that in the event of such a line falling west of the junction of the English with the Winnipeg river the northern boundary shall follow the latter westward to the point where the meridian of the angle strikes it. The boundary from the angle to Lake Superior is formed by the Lake of the Woods, Rainy River, Rainy Lake and one of its easterly extensions to the height of land, and (east of the latter) by Pigeon river, which empties into Lake Superior.

The contention of the Dominion Government has always been that the northern boundary should be the height of land separating the waters flowing into Lake Superior from those flowing into Hudson's Bay, and that the western boundary should be a line drawn due north from the junction of the Ohio with the Mississippi river. The dispute respecting the western boundary has always turned on the meaning to be attached to the word "northward" in a definition of the southern and western boundaries of the old Province of Quebec, as the latter was constituted by the Imperial Act of 1774. As this definition is in itself a matter of some interest, it is given here in full. It must be borne in mind (1) that the then Province of Quebec was afterwards divided into Upper and Lower Canada; (2) that the Act of 1774 was passed before the colonies which make up the United States became independent, and (3) that the object of the definition was to include in the Province of Quebec all the territory settled chiefly by French-speaking people. The Act provides that "all the territories, islands, and countries in North America belonging to the crown of Great Britain, bounded on the the south by a line from the Bay of Chaleurs, along the high lands which divide the rivers that empty themselves into the river St. Lawrence from those which fall into the sea, to a point in forty-five degrees of northern latitude on the eastern bank of the river Connecticut, keeping the same latitude directly west through the Lake Champlain, until in the same latitude it meets the river St. Lawrence, from thence up the eastern bank of the said river to the Lake Ontario, thence through the Lake Ontario and the river commonly called the Niagara, and thence along by the eastern and south-eastern bank of Lake Erie, following the said bank until the same shall be intersected by the northern boundary granted by the charter of the province of Pennsylvania, in case the same shall be so intersected, and from thence along the said northern and western boundaries of the said province until the said western boundary strike the Ohio; but in case the said bank of the said lake shall not be found to be so intersected, then following the said bank until it shall arrive at that point of the said bank which shall be nearest to the north-western angle of the said province of Pennsylvania, and thence by a right line to the said north-western angle of the said province, and thence along the western boundary of the said province until it strikes the river Ohio, and along the bank of the said river westward to the banks of the Mississippi, and northward to the southern boundary of the territory granted to the Merchants Adventurers trading to Hudson's Bay" should be, "during His

Majesty's pleasure, annexed to and made part and parcel of the province of Quebec as created and established by the royal proclamation of the 7th October, 1763."

The contention of the Dominion Government now is that the word "northward" must be held to mean "due north," and that the old province of Quebec never legally extended further west than the meridian of the mouth of the Ohio, which strikes the north shore of Lake Superior in the neighbourhood of Prince Arthur's Landing. The contention of the Ontario Government is that "northward" must be held to mean in a northerly direction along the Mississippi to its source and then along a line due north from that point. The latter is the view taken unanimously by the arbitrators, who also located the source of the Mississippi in Lake Itasca in Minnesota, which is almost due south of the north-west angle of the Lake of the Woods. Of course the treaty of Paris, under which Great Britain recognized the independence of the United States and agreed to the upper lakes as an international boundary, did away with that part of the one above defined which lay south of Lake Erie. It did not, however, alter the position of the starting point by which to determine the western boundary of Ontario, which is by common consent the western boundary of old Quebec.

PROVINCIAL AREAS.

It will make a great difference in the area of Ontario whether she secures or fails to secure the territory covered by the award.

By an Act of the Dominion Parliament, passed in 1881, the province of Manitoba was greatly enlarged, its eastern boundary being made to coincide with the western boundary of Ontario. As the latter is still unsettled it follows that part of the disputed territory will fall into Manitoba if Ontario loses it. This part has been computed to contain 39,000 square miles. With the addition of this territory the area of Manitoba would be about 154,000 square miles. If Ontario loses the 39,000 square miles to the west she will also lose the territory north of the height of land—that is, about 95,000 square miles in all—leaving her with an area of about 110,000 square miles. It is a matter of some interest to know that Quebec comprises nearly 200,000 square miles and British Columbia nearly 400,000. By reference to the "Notes" in the June number of the *School Journal* it will be seen that the four districts into which the Northwest territory has been divided—probably with a view to their ultimate erection into new provinces—have areas, respectively, of 95,000, 114,000, 100,000, and 122,000 square miles.

Mathematical Department.

INTERMEDIATE EXAMINATIONS.

JULY, 1882.

ARITHMETIC.

TIME—THREE HOURS.

1. The fore and hind wheels of a carriage are 9 and 12 feet in circumference respectively. There are two points, one in each circumference, at present in contact with the ground. Shew that as the carriage moves on, these points can never at the same time be the highest points of each wheel.

2. Reduce  $\left\{ \frac{5\frac{1}{2} - \frac{1}{2} \text{ of } 2\frac{3}{4}}{\frac{2}{3} \text{ of } 4\frac{1}{2} + \frac{1}{2}} - \frac{859}{1085} \right\}$  of 3 lbs. to the fraction of 5 tons.

3. Prove that  $\cdot 48732$  is equal to  $\frac{48684}{99900}$ .

4. Find the present value of \$320.00, due two years hence, at 8 per cent. per annum, compound interest.

5. Find approximately in how many years a given sum of money will double itself at 15 per cent. per annum, compound interest.

6. How large a bill of exchange on Paris can be bought for \$1600.00 currency, exchange being at the rate of \$1 for 5.25 francs, and gold at a premium of  $8\frac{1}{2}$  per cent.?

7. On July 10th a banker discounts a note for \$500.00, made May 10th, at six months, at the rate of 8 per cent. per annum. At what rate does he receive interest on his money?

8. A sells an article at a certain advance per cent. on the cost to B, who, in turn, at the same advance per cent., disposes of it for \$19, finding that had he sold for \$13 he would have lost per cent.  $1\frac{1}{2}$  of what he now gains per cent. What did A pay for the article?

9. Equal weights of gold and silver are in value as 20 to 1; and equal volumes are in value as 1284 to 35. A certain volume is composed of equal weights of gold and silver; find how many times more valuable the same amount would be were it composed wholly of gold.

10. The volume of a sphere is found by multiplying the cube of the radius by 4.1888; and the area of a circle by multiplying the square of the radius by 3.1416. Find the area of a circle which by rotating about a diameter will describe a sphere whose volume is 1 cubic foot.

Values:—1, 10; 2, 8; 3, 7; 4, 8; 5, 9; 6, 9; 7, 10; 8, 13; 9, 13; 10, 13.

SOLUTIONS.

1. Let A be the given point in the fore-wheel and B in the hind wheel. B will be at the top when the carriage has moved on 6 feet, at which point A will have passed the top; B will again be at the top after 18 feet advance, at which point A will be on the ground; B will next arrive at the top after 30 feet advance, A will have passed the top; and after 36 feet progress, A and B will both be in the initial position in contact with the ground; and the same relative positions will be repeated over and over, through every 36 ft. forever, so that A and B can never be at the top simultaneously.

2. Fraction within brackets=1.  $\therefore$  Ans. =  $\frac{3}{10000}$

3. Book-work.

4. P. W. =  $320 \div (1.08)^2 = 290000 \div (9 \times 9 \times 9) = \$274.348$ .

5. Amt. of \$1 = 1.73+, at end of 4th year  
" " \$1 = 2.011+, at " " 5th year. Ans. 5 yrs., nearly.

6. \$1085 currency = \$1000 gold, \$100 gold = 525 francs, x francs = \$1500 currency  $\therefore x = \frac{1000 \times 525 \times 1500}{1085 \times 100} = 7258$  francs " 7 centimes, nearly.

7. Banker pays \$52 and receives back \$100, i. e. int. =  $\frac{48}{52} = 8.7\%$  nearly.

8. B's cost + B's gain = \$19

B's cost -  $\frac{1}{4}$  B's gain = \$13

$\therefore \frac{3}{4}$  B's gain = \$6, or B's gain = \$8

$\therefore$  B's cost =  $19 - 8 = 11 = A$ 's selling price

i. e. B gains 8 on 11, or  $\frac{8}{11}$  per dollar invested.

$\therefore \frac{7}{16}$  A's cost = \$4 $\frac{2}{3}$

A's cost = \$14.04 $\frac{10}{11}$ .

The phrase "lost per cent.  $1\frac{1}{2}$  of what he now gains per cent.," we have taken to mean " $1\frac{1}{2}$  times what he now gains &c."

9. The mixture is evidently worth 21 times the silver in it. It contains a certain volume of silver; if this volume of silver were converted into gold it would be worth  $1\frac{2}{3}$  of the silver now in the mixture; and the gold already present is worth 20 times the silver now in the mixture. Hence if all were gold the mass would be worth  $(1\frac{2}{3} + 20)$  times the silver now in the mixture =  $13\frac{2}{3}$  times the silver in mixture.

Hence  $13\frac{2}{3} \div 21 = 2\frac{2}{3}$  times more valuable.

10. Observe that 4.1888 =  $\frac{1}{3}$  of 3.1416. Let 3.1416 =  $\pi$ , and radius of sphere and circle = r. Then we have given  $\frac{4}{3} \pi r^3 = 1728$  cub. in., to find  $\pi r^2$ .

We get  $r = 6\sqrt[3]{6} \div \sqrt[3]{\pi}$

$\therefore \pi r^2 = 36\sqrt[3]{36\pi} = 36\sqrt[3]{36} \times 3.1416 = 216\sqrt[3]{5236} = 216 \times 80598 = 174085 + 14$  inches.

ALGEBRA.

TIME—TWO HOURS AND A HALF.

1. Form an expression symmetrical with respect to x, y, z, it similar to  $x^3 + y^3 + z^3 - 3xyz$ ; and write down the quotient on dividing it by  $x + y + z + u$ .

2. Factor  $ax^3 - (a + b)(x - y)xy - by^3$ .

Deduce, or find by other means, the factors of  $(a+b)^2(x+y) - (x+2y+z)(a-c)(a+b)(b+c) - (b+c)^2(y+z)$ .  
Obtain four different relations between the quantities  $a, b, c, d$ , for any one of which the expression  $4(ad-bc)^2 - (a^2+d^2 - b^2-c^2)^2$  will vanish.

3. Find the lowest common measure, not being a fraction, of the quantities  $\frac{x^2+5x+6}{x+4}$  and  $\frac{x^2+7x+12}{x-5}$ .

4. Reduce to lowest terms the following fractions:—

(1)  $\frac{6x^2-5x-1}{x^2-x-1}$  (2)  $\frac{(a-b)(b-c)(c-a)}{(a-b)^2+(b-c)^2+(c-a)^2}$ .

5. (1) If  $y+z+u=a, z+u+x=b, u+x+y=c, x+y+z=d$ , then

$$\frac{1}{1+\frac{a}{x}} + \frac{1}{1+\frac{b}{y}} + \frac{1}{1+\frac{c}{z}} + \frac{1}{1+\frac{d}{u}} = 1.$$

(2) If  $ax=b+c, by=c+a, cz=a+b$ , then

$$\frac{1}{1+x} + \frac{1}{1+y} + \frac{1}{1+z} = 1.$$

6. Solve the equation  $ax^2+bx+c=0$ .

What value of  $x$  will satisfy the equation

$$\frac{b-c}{x+a} + \frac{c-a}{x+b} + \frac{a-b}{x+c} = 0.$$

7. Solve the equations

(1)  $\frac{7x}{3} - \left\{ \frac{1}{2} - \left( \frac{x}{3} - \frac{x-1}{2} \right) \right\} = \frac{4x-2}{5}$ .

(2)  $\frac{x-4}{28} - \frac{x-3}{20} = \frac{x-5}{9} - \frac{1}{x-1}$ .

(3)  $\begin{cases} x^2+x^2y^2+y^2=21 \\ x^2+xy+y^2=7 \end{cases}$

8. Solve the equations

$$\begin{cases} x+y+z=6 \\ 3x+2y-z=4 \\ x+3y+2z=13 \end{cases} \quad \begin{cases} 3c-2y+5z=4 \\ x-4y+z=1 \\ 4x-6y+6z=5 \end{cases}$$

9. The edge of a cube is 3 feet. What must be taken as the unit of length that the number expressing the sum of the areas of the faces may be the same as that which expresses the sum of the lengths of the edges?

10. The hour, minute and second hands of a watch are on concentric axes, the same divisions on the dial answering for both minutes and seconds. Find when first between 3 and 4 o'clock the second hand will equally divide the interval between the minute and hour hands.

Values:—1, 1+3; 2, 4+5+5; 3, 4; 4, 5+6; 5, 5+3; 6, 5+7; 7, 4+6+7; 8, 7+8; 9, 7; 10, 8.

SOLUTIONS.

1. i.  $x^2+y^2+z^2+u^2-3(xy+yz+zu+xy+yz+zu)$   
ii.  $x^2+y^2+z^2+u^2 - (xy+yz+zu+xy+yz+zu)$ .

2. i.  $(ax-by)(x^2-xy+y^2)$  Ans. Observe that  $a$  and  $b$  are involved to a single power, hence arrange according to  $a$  and  $b$  as letters of reference, and the expression splits up as above.

ii. It is easily seen that this expression is (i) with  $(x+y)$  for  $a, y+z$  for  $b, a+b$  for  $x$ , and  $b+c$  for  $y$ . Hence substitute the values for  $x, y, a$ , and  $b$  in the result of (i) and we get

$$(ax+ay+bx-cy-bz-cz)(a^2+b^2+c^2+ab+bc-ac).$$

iii. Factor the expression, equate each factor to zero, and we get  $a+b+c+d=a-b-c+d=-a+b+c-d=-a-b-c+d=0$  which may be put in the forms  $a+b+c+d=0; a+d=b+c; a+c=b+d$ .

3. Given fractions are  $\frac{(x+3)(x+2)}{x+4}$  and  $\frac{(x+4)(x+3)}{x+5}$  and  $x+3$  is the measure. Without the limitation in the question it would have been  $(x+3) \div (x+4)(x+5)$ .

4. i.  $(6x^4+x^3+x^2+x+1) \div (x^4-1)$

ii. Denominator  $= 3(a-b)(b-c)(c-a) \therefore$  Ans.  $= \frac{1}{3}$ .

5. i. Fractions  $= \frac{x}{a+x} + \frac{y}{b+y} + \&c.$

From given relations  $x+y+z+u=a+x=b+y=\&c.$

$$\therefore \text{sum} = \frac{x+y+z+u}{x+y+z+u} = 1.$$

ii. Given  $x=(b+c)+a, \therefore 1+x = \frac{a+b+c}{a}$  and by symmetry

$$1+y = \frac{a+b+c}{b}, \&c.$$

$$\therefore \text{sum} = \frac{a+b+c}{a+b+c} = 1$$

6. i. Transpose  $c$ , multiply through by  $4a$ , add  $b^2$  to both sides, extract square root and we get  $x = \left\{ -b \pm \sqrt{b^2 - 4ac} \right\} + 2a$

ii. Put the equation in the form

$$\left\{ \frac{b-c}{1+\frac{a}{x}} + \frac{c-a}{1+\frac{b}{x}} + \frac{a-b}{1+\frac{c}{x}} \right\} = 0$$

Observe that the sum of  $b-c, c-a, a-b$  is 0

Now as  $x$  increases in value the fractions  $\frac{a}{x}, \frac{b}{x}, \frac{c}{x}$  become less

and less, and the denominators  $1+\frac{a}{x}, \&c.$  approach nearer and nearer to 1. Thus when  $x$  is endlessly increased these denominators all become  $=1$ , and expression within bracket  $=0$ , i. e. the given equation becomes  $0=0$  when  $x=\infty$  which is therefore the root.

7. i.  $x = -\frac{1}{2}$ .

ii. Add each side separately and we get

$$\frac{8x-4}{(x-4)(x-3)} = \frac{8x-4}{(x-5)(x-1)}$$

$\therefore 8x-4=0$ , and  $(x-4)(x-3)=(x-5)(x-1)$  i. e.  $x=\frac{1}{2}$  or 7.

iii. Dividing we have  $x^2-xy+y^2=3, \therefore xy=2$ , and  $(x+y)^2=9, (x-y)^2=1$  &c.  $x=\pm 2, \pm 1$ .

$$y=\pm 1, \pm 2.$$

8. i.  $x=1, y=2, z=3$ .

ii. The equations are insufficient to determine  $x, y$  and  $z$ , for the third is simply the sum of the first and second, and we can only establish a relation between any two. The number of independent equations is not equal to the number of unknown quantities.

9. A cube has six faces and twelve edges. If  $x$  be the length of an edge, we require to have  $6x^2=12x$ , or  $x=2$ , i. e. the length of the edge must be two units. Hence in the case given 3 ft. must be two units, and the unit = 18 inches.

10. At 3 o'clock the minute hand and the second hand are both at XII, and the hour hand at III. Let  $x$ =space moved by hour hand before second hand gets midway between the other two hands,  $\therefore 12x$ =space travelled by minute hand, and  $720x$ =space by second hand. Thus the second hand must be  $708x$  ahead of the minute hand = distance behind hour hand,  $\therefore 707x$ =distance of second hand from III  $\therefore 720x+707x$ =distance from XII to III = 15 minutes.

i. e.  $x = \frac{15}{707}$  minute divisions passed by hour hand.

$\therefore$  Second hand has moved  $15 \times \frac{720}{707}$  minute divisions = number of seconds the clock has measured  $= 7 \frac{15}{707}$ .

NATURAL PHILOSOPHY.

TIME—TWO HOURS AND A HALF.

1. A beam 14 feet long is supported at both ends; a weight of 1200 pounds is suspended 4 ft. from the centre. Find the pressure at each point of support. (Weight of beam to be neglected).

What power (in pounds) is required to draw a train of cars, weighing 158 tons, up a railway grade rising 10 inches in every 100 feet? (Friction to be neglected.)

3. Given the diameters of the two cylinders of a hydrostatic press and the force applied to the piston, determine the pressure produced.

4. A man exerting all his strength can just raise 230 pounds. What would be the weight of a stone (spec. gr. 2.9) which he could just raise under water?

5. To what height will glycerine (spec. gr. 1.27) rise in a Toricellian tube when the barometer stands at 30.5 inches, specific gravity of mercury being 14?

6. Describe a simple experiment to illustrate

(i.) The buoyancy of the air, and

(ii.) The variation of the buoyancy, with the barometric pressure of the air.

7. A power of 12 pounds on a wheel, the diameter of which is 8 feet, balances a weight of 280 pounds on the axle, what is the diameter of the axle, the thickness of the rope on the wheel being one inch, on the axle two inches? (The rope regarded as perfectly flexible, and the whole weight being supposed to act along its centre.)

8. Describe Nicholson's Hydrometer.

9. Distinguish between

(i.) Mass and weight;

(ii.) Density and specific gravity.

10. Define the term "equilibrium," and distinguish between stable and unstable equilibrium.



It is to be hoped that the efforts already made, and others that may yet be made, to secure for Canada the services of Mr. Smith, will be successful. Co-operation between the Provinces is absolutely necessary and could surely be secured by conference between the heads of the various Education Departments. Such an enterprise, if undertaken in an energetic and liberal spirit would add another strand to the tie that binds the Provinces of the Dominion together.

## SECONDARY EDUCATION.

One of the most marked educational "signs of the times" is the deep and wide-spread interest in the subject of Secondary Education. In too many countries there is still a huge and unsightly gap between the common school and the university, and between the common school and institutions designed to impart purely professional training.

In Ontario, happily, much has been done to articulate symmetrically the various departments of the educational system. A straight road has been opened up, and kept open, by which the ambitious youth may pass from the primary school to the university, and whatever may be the ultimate effect of the new departmental regulations on high schools and collegiate institutes, they may at all events be taken as evidence that public attention had been actively directed to the status and work of those institutions, and that practical experiment in some shape was called for, in order at least to test the possibility of making them increasingly popular and efficient.

In Scotland the question of connecting the parochial schools with the national universities, by a class of efficient intermediate schools, is exciting interest. Dr. Donaldson, the well-known rector of the Edinburgh high school, on the occasion of his recent transference to Aberdeen, drew attention to this subject by his somewhat celebrated exposition of the lack of such secondary schools in Scotland and the consequences which it involves. As a matter of national concern, the question of supplying this lack has already been introduced into Parliament. An "Endowment Bill" has been introduced as a government measure by Mr. Mundella, Under-Secretary of the Department of Education, with that end in view. Existing defects are plainly recognized. A graded system of schools, with provision for higher instruction in one school in each district, is proposed. It is also suggested that, by associated effort, secondary schools be established in central localities for the accommodation of the districts of several school boards. The bill, whose passage thus far through the House of Commons has been watched with deep interest by the people of Scotland, owes its title to the fact that it proposes to deal with certain quasi-educational endowments, the benefits of which have hitherto accrued but slightly to the support of education. A commission of seven members is created by the bill to reorganize these endowments in the interests of secondary education.

In Prussia the Minister of Public Instruction has prepared new schemes of study for all classes of secondary institutions. The publication of these regulations had been awaited with peculiar interest on account of the serious conflict of opinion which had prevailed as to the relative importance of classical and non-classical studies. A late number of *Education* gives an interesting outline of the new plans in relation to the institutions affected. The latter are:

(1). Gymnasia, classical schools preparing for the university, (2). Real-gymnasia, secondary schools preparing for higher technical schools and for the faculties of philosophy in the universities; (3). Ober-real-schulen, non-classical secondary schools preparing for technical and commercial schools, (4). Higher burgher-schools, secondary schools preparing for industrial, lower technical and

commercial schools. Gymnasia, real-gymnasia, and ober-real-schulen have each nine classes; higher burgher-schools six. While the subjects of instruction in the gymnasia include German, Latin, Greek, and French, together with mathematics, physics, &c., in the real-gymnasia, Greek is omitted and English and chemistry introduced. In the ober-real-schule both Latin and Greek are omitted, chemistry and English being substituted therefor. In the higher burgher-schools physics is omitted as well as Latin and Greek, and English and natural philosophy introduced.

In the Maritime Provinces of the Dominion of Canada, particularly in Nova Scotia and New Brunswick, the subject of secondary education is receiving considerable attention, as will be seen by reference to late reports of the respective superintendents of education. Neither the county academies of the former, nor the grammar schools of the latter province, seem to be working with perfectly satisfactory results, though some of them are efficient institutions. In fact few high schools in the Dominion have achieved more conspicuous success than the well-known Pictou Academy in Nova Scotia.

## STONE THROWERS IN A GLASS HOUSE.

To the Editor of the Canada School Journal.

The writers of the editorial articles in your neighbour and contemporary, the *Educational Monthly*, are constantly sneering at the style of the Minister of Education. I have yet to learn that ability to write perfect English is an essential qualification of any administrative officer, and therefore I am not going to defend Mr. Crooks from this kind of criticism. It is so easy to make slips in composition that any one may be pardoned for making them except that insufferable bore and nuisance, the self-constituted critic who is for ever correcting other people.

I have always noticed that this class of charlatans, like their fellow-snobs of the social order, are so intent in watching the slips of others that they are constantly making slips of their own, and the editorial writers of the *Monthly* are no exception to the rule. I propose, with your consent, to prove this assertion true by a reference to the editorial articles in the August number of that journal, and I confine my notice to the editorial articles because, as a rule, the contributors know how to write.

On page 301 I find the following sentence:

"The quoting of untranslated parallel passages from different Latin and Greek authors is of doubtful value to the ordinary Intermediate or University candidate, who is sure to look upon a *disjectum membrum* as a chimera to be avoided."

This is an instance of "mixed metaphors," for which the writer and not the supposititious candidate must be held responsible. On the same page I find:

"If the limits of the volume had permitted, we would like to have seen more translation."

The writer meant to say that he "would have liked to see," but evidently did not know how to do it. This form of error is so common, even amongst educated people, that it might be allowed to pass unchallenged except when perpetrated by the literary snob. Again, and still on the same page:

"In this way, in the first nine chapters, plants representing typical orders belonging to the exogens or dicotyledons are gone through with."

The "exogen or dicotyledon" is an individual plant, and in botanical classification the individual *belongs to* the order while the order *includes* the individual. The next sentence but one on the same page reads thus:

"In chapters twelve and thirteen the morphology of the various organs of plants is described."



"Morphology" means a description of forms, and this description of forms, the writer says, is described in the aforesaid chapter. He should have said either that the "morphology is treated of" or that the forms of the various organs are described. On page 303 I read:

"In written composition scholars are supplied with elliptical sentences to be filled in; are required to write a summary of a previous reading lesson, we presume with the heads of the lesson first arranged by themselves, or supplied to them by the teacher; to write sentences of a certain kind; to introduce grammatical equivalents, to paraphrase, to write original compositions," &c.

This sentence is, as it proceeds, made thoroughly unsymmetrical by the change in the extent of the ellipsis. At first only the subject is omitted; afterwards both subject and verb are left out. No good writer would construct such a sentence. On the same page we are told that there is a "difference in two schools" instead of *between* two schools. On page 300 the opinion is expressed that "it would not have been amiss to have added special questions" where the writer meant that it "would not have been amiss to add," &c. But this particular error is so common in the *Monthly* as to induce me to believe that several members of the staff—notably its editor-in-chief—know very little about the laws that govern the sequence of tenses. I quote from the same page the following sentence which contains an excellent example of what the French call *construction louche*—"squinting construction"—the use of which is utterly inexcusable in any one pretending to have even an ordinary English education:

"It is not unreasonable to look, if not with disfavour, at least with apprehension, upon any organic changes in the Departmental Regulations he may wish to originate."

The writer in this sentence speaks of the origination of an entirely new set of regulations, whereas he meant to refer only to the origination of organic changes in a set already in existence. The next sentence is as follows:

"Unfortunately, moreover, his knowledge of the working of our school system, and the necessity that now and again arises for its reconstruction, is derived at second-hand."

By neglecting to keep his ellipses symmetrical the writer says what he does not mean, and says it ungrammatically. As the sentence stands, "knowledge" and "necessity" are co-ordinate with each other, whereas "working" and "necessity" are meant to be so. Look at this for "fine writing":

"But the Central Committee of late has become so mythical an organization, that we hardly know that it has palpable form and substance, or, if it has, that the Minister deigns to make use of it."

It is a pity that the use of "that" for "so" has since Shakespeare's time degenerated into a provincialism, for otherwise our "fine writer" might have put in another "that" when he is so fond of the word. On pages 305-306 I find this curious sentence:

"One thing is plain, however, that if the SCHOOL JOURNAL's abstract is genuine, the Minister, in the Proposed Amended Regulations of the Department, has undertaken a heavy and rather astonishing task, and, in dealing with it, accepts a grave responsibility."

Passing over some other points I cannot help coming to the conclusion, from the peculiar use of the word "genuine," that the writer has read Bishop Watson's remarks on the terms "genuine" and "authentic," and, like *Little Buttercup* in "Pinafore," has mixed them up. Authorities are not agreed as to the precise force of "genuine" when applied to a literary production, but I cannot recall any definition of it which would justify the above use of the term. On page 306, speaking of some of the amendments, which commend themselves to common sense, the writer asserts that Mr. Crooks "has been forced to adopt them by enlightened public opinion;" the ordinary way of adopting them is by order-in-council. The following sentence from the same page contains another good example of squinting construction.—

"But Mr. Crooks is so wanting in sensitiveness of apprehension, and, constitutionally, is so little in sympathy with the teacher and his work, that it would seem futile to look to him *satisfactorily* to guide or govern educational opinion."

"Satisfactorily" can be construed quite as satisfactorily with what precedes as with what follows—it looks two ways at once, like the cook who was described as being able to see into the pot with one eye while with the other she looked up the chimney. The *pendant* for "fine writing" is shown by the use of "would seem" instead of "seems," which correctly gives the writer's meaning. Further on, and still on the same page I learn that the Minister's "wordy flatulence is *only* equalled by his pretentious ignorance." As I do not like to answer a fool according to his folly I must say that the writer's vulgar malice is equalled *only* by his inability to put one of the most common adverbs in its right place in a sentence. On the same page I find "partizanship," while on page 305 I find "partisanship." Old English usage would justify the former; modern usage permits only the latter, and even if usage were more accommodating, the two forms should not appear side by side in the same article. On page 308 I find the expression, "reduction of the subjects," where the writer means a reduction in the number of subjects. On page 309 occurs this sentence:—

"It is, therefore, improper for Mr. Buchan to hold this position so long as he has charge of a school from which there may be, if there has not been, candidates for the "Intermediate."

I recommend the correction of this sentence, and others similarly constructed, as a grammatical exercise admirably adapted to the capacity of candidates in training for the entrance examination. On page 310 I learn that the examiner who prepared the grammar paper for first class candidates at the recent midsummer examinations "cribbed" questions "from Fleming, Bain, and Morris's Elementary Grammars," that is, from a series of such grammars prepared by a firm under the style of "Fleming, Bain, and Morris." If it does not mean that, then it must mean that the questions were taken from Fleming's, Bain's, and Morris's Elementary Grammars. On the same page I find the same writer making use of the expression, "either about their utility or their inutility," when he meant either "about either their utility or their inutility, or either about their utility or about their inutility;" and this reminds me that—to use an expression of Sidney Smith's—since I am pursuing him not from the love of glory but from the love of utility, as a burgomaster hunts a rat in a Dutch dyke, I may as well drop the pursuit when I have run him fairly down.

I do not wish your readers to carry off the idea that the July-August number of the *Monthly* is below the average in point of literary excellence. On the contrary, it is not so open to criticism as some others through which I have cursorily glanced. Let me in conclusion quote, for the benefit of the linguistic critic of the *Monthly*, the lines addressed by Pope to literary critics in general.

"But you who seek to give and merit fame,  
And justly bear a critic's noble name,  
Be sure yourself and your own reach to know,  
How far your genius, taste, and learning go;  
Launch not beyond your depth, but be discreet,  
And mark that spot where sense and dulness meet."

DELTA.

He that is thy friend indeed,  
He will help thee in thy need;  
If thou sorrow, he will weep;  
If thou wake he cannot sleep,  
Thus of every grief in heart  
He with thee doth bear a part,  
These are certain signs to know  
Faithful friend from flattering foe.

—Shakespeare.

Examination Questions.

PROMOTION EXAMINATION.

DIVISION NO. I, COUNTY LAMBTON,

GEOGRAPHY.—II TO III CLASS.

1. Define island, bay, desert, cape; giving two examples of each.
2. Name the principal lakes between the United States and Canada.
3. What is the capital of each of the following: Alaska, Canada, United States, Quebec, Manitoba, Mexico.
4. Name the principal rivers and mountains of North America.
5. Name the railroads in Lambton, and tell on which are the following stations: Alvinston, Thedford, Point Edward, Wyoming, Watford, Courtwright.

III TO IV CLASS.

1. Define estuary, meridian, oasis, geography.
2. Name the principal mineral products of Canada, and the vegetable products of United States.
3. Where and what are Emerson, New Orleans, Peel, Credit Valley, Miramichi, St. Louis, Norman's Woe, Beaver, Truro, Strathroy.
4. Draw a map of the Dominion, locating the mountains, rivers, the and the principal railways.
5. Mention the largest river that empties into the Caspian, Black and Mediterranean Seas, and state the outlets of the Black and Mediterranean Seas.
6. What is the general direction of the mountain systems of the old world; 2nd, of the new world.  
Values— from II to III class, each question 20 marks.  
Values from III to IV class, 1=12, 2=14, 3=18, 4=36, 5=12, 6=8.

GRAMMAR—III TO IV.

1. (a) Define "gender," "preposition," "adverb," "sentence," "vowel."  
(b) Write the feminine forms of "giant," "heir," "nephew," "youth," "colt," "earl," "beau," "papa," "sir," "bridegroom."
2. (a) What is meant by *inflection*?  
(b) What are the inflections of the noun?  
(c) Write the possessive singular and plural of *child*, *ox*, *boy*, *fly*.
- (d) Parse all the nouns in the following.—"So ended Hannibal's first campaign in Italy."
3. (a) Define *number*.  
(b) Write sentences containing the singular forms of the following verbs:—"go," "were," "sing," "shake"  
(c) Write two sentences, one containing the word *which* in the singular, and the other the word *which* in the plural.  
(d) Make two sentences containing the word "whom."  
(e) Which is correct "monies" or "moneys"? Why?
4. Analyze { (a) "So ended Hannibal's first campaign in Italy."  
(b) The wolves having regained their feet, sprang directly towards me.  
(c) "Ah," said Mr. Grant, "my saying was true."  
(d) There were no men there.
5. Combine the following statements into longer sentences.—The boy wrote. He was a good boy. He wrote a letter. He wrote to his father. He wrote on his birthday. The boy was at school. It was a long letter. He wrote it early in the morning. He wrote it before breakfast.  
Values—1. 15; 2, 20; 3, 30; 4, 20; 5, 15.

IV TO V CLASS.

1. Parse the words in italics in the following:  
*It is but too common, my countrymen, to observe a material difference between the behavior of those who stand candidates for places of power and trust before and after receiving them.*
2. Analyze the following:  
The history of the world is full of testimony to prove how much depends upon industry. Not an eminent orator has lived but is an example of it.
3. Define:  
(a) Collective noun, relative pronoun, adverbial phrase, and write sentences containing an example of each.

- (b) Write possessive plural of child, John, artist; and the possessive singular of conscience, door, scissors.
- (c) Write plurals of courtmartial, Mussulman, handful.
- (d) Compare far, ill, gay, square, extreme.
- (e) Give the principal parts, including the present participle of the following verbs:—be, lie, lay, sit, set, go.
4. (a) Explain the meaning of the following:  
Excuse my writing more.  
Excuse my not writing more.  
(b) Correct or justify, giving reasons:  
There are few artists who draw horses as well as Mr. Jones.  
(c) Distinguish sanitary, and sanatory; stationary and stationery; place and plaice; throw and through.
5. Write a composition of ten lines on Summer, paying attention to style, grammar and writing.  
Values 1, 30; 2, 14; 3, 26; 4, (a) 5. (b) 5. (c) 5; 5, 15.

SPELLING—I TO II CLASS.

The cents they could spare. Safely through the night. Heard of the tricks. The deep boom of the surf. Young lion's whelp. Friends now tease him. Tact with his horse. Teacher did reply. Birds of rich voice and bright hues flew in the groves. Owl caught the snail. The surest way to be happy. Squirrel, naughty, straight, ceiling, foolish, minutes, romps, written, given, endless, peace.

II TO III CLASS.

Sentenced to be hanged. Seeing so valued a friend. Served in Parliament. Conquered Franco. Contently refused his earnest wishes. Patience. Diverting tricks. A moment's reckless folly. Deliberate opinion. The proposal was readily acceded to. Pleasantly surprised. Too. Complaisance of his master. Demurred, dolefully, merely, luscious, clever, tortoise, tormentor, special, knighted, guidance, perseverance, separated, plagues, ponderous, cruel, feathers.

III TO IV CLASS.

Third book, page 232, Arriving—ammunition. Third book, page 83, Delighted—many months. Equitable, scampering, contemporaries, promiscuous, cutlass, marines, extremely, odoriferous, sepulchre, regretting, expedition, ramparts, sallies, cannibals, superstitious, paroxysm, venison, individuals.

IV TO V CLASS.

Fourth book, page 15, In all probability—supplies. Fourth book, page 89, Before he died—enemy. Enormous buttresses. Assuaged their appetites. Suzerain or feudal lord. Achievement. Sanguinary broils of politics. Bitterly regretted. Obsequies, cavalcade, heroically; antagonist, persuaded.  
Three marks off for each error in all classes.

ARITHMETIC—I TO II CLASS.

1. Write in words 147, 106, 9037.  
Write in figures four hundred and seventy, thirteen thousand five hundred and six.
2. Find the sum of 4736 + 71084 + 736 + 74 + 908862, and seven hundred and three.
3. A man earns \$30 per month, he pays \$15 a month for house rent, and \$40 per month for other expenses, how much money will he have at the end of three months?
4. A had \$20, B had three times as much, less \$10, and C \$15 more than A and B. How much had they all?
5. From 90372986 take 30382997.
6. A man has \$2,000, which he gives to his three boys, to the first \$500, to the second, \$275 more than the 1st, and the 3rd the rest. How much did the 3rd get.  
Values—1, 12; 2, 10; 3, 20; 4, 30; 5, 18; 6, 10;  
Note—Nos. 2 and 5 to be absolutely correct, or no credit.

CLASS II TO III.

1. Express 30030030 in words, and sixty-seven thousand and forty-six in figures.
2. Express the following in figures: XIX, XCIV, XXXIX.
3. Multiply 9908807 by 90720400, and divide the product by 56708.
4. Two persons start at the same point and travel in opposite directions, one at the rate of 34 miles a day, and the other at the rate of 28 miles a day; how far apart will they be at the end of 14 days?

5. Bought 9 chests of tea, each containing 72 pounds, at 57 cents per pound. Sold 239 pounds at 68 cents per pound, and the remainder at cost. How much did I gain on each pound?

6. A flour merchant bought a quantity of flour for \$18,750, and sold the same for \$26,250, by which he gained \$3 a barrel. How many barrels were there?

Note—3. to be absolutely correct or no credit given.  
Values—1, 10; 2, 9; 3, 21; 4, 20; 5, 20; 6, 20.

III-TO IV CLASS.

1. (a) Find the least number which can be divided by 7, 12, 15 and 24, with a remainder 3 in each case.

(b) Find the greatest number which will divide 6332 and 23999, leaving as remainders 5 and 2 respectively.

2. (a) Simplify  $3\frac{2}{3}$  of  $\frac{9}{22} + 7\frac{1}{2} - 4\frac{1311}{5244}$  of  $\frac{1}{34} + \frac{3}{32}$

(b) Reduce  $\frac{31652852}{71218917}$  to its lowest terms.

3. Which is greater  $\frac{54}{7}$  of  $\frac{5}{21}$  or  $\frac{7}{60}$ ?

4. Reduce 3 miles 5 fur. 10 per. 880 yds. to furlongs.

5. Four thousand soldiers were supplied with bread for 24 weeks, each man to receive 14 ounces per day; but by some accident 210 barrels containing 200 lbs. each were spoiled; what must each man receive per day in order that the remainder may last the same time?

6. Divide \$350 among A, B, and C, so that as often as A gets \$5 B may get \$4, and as often as B gets \$3, C may get \$2.

7. A merchant bought goods to the value of \$4400, and sold them for \$4950. What fraction of cost was the gain?

8. A grain dealer bought oats at 40 cents per bushel; at what price per bushel must he sell them in order that the money he receives for 48 bushels, may be equal to his gain on \$179.20 of outlay?

Values—1, 10, (i.e.) 5+5; 2, 5+5; 3, 5; 4, 10; 5, 10; 6, 20; 7, 10; 8, 25.

CLASS IV TO V.

1. Simplify  $\frac{2\frac{1}{2}}{1\frac{1}{3}} + 4 \cdot 3 \left\{ \frac{7}{5} \text{ of } \frac{7\frac{2}{3}}{6\frac{1}{2}} + 2 \cdot 1 \right\} \div \frac{1}{3}$

2. Find G. C. M. of 17598, 46090 and 171347.

3. A stationer sold pens at 10s. 6d. a thousand, by which he cleared  $\frac{1}{3}$  of his money; but growing scarce he raised them to 12s. per thousand. What fraction of the cost did he clear at the latter price?

4. A man bought 17 bales cotton goods containing 587 $\frac{1}{2}$  yds. at 8 $\frac{1}{2}$  cents per yd.; he sold  $\frac{1}{3}$  of it at 11 $\frac{1}{2}$  cents per yd. and  $\frac{2}{3}$  of the remainder at 12 $\frac{1}{2}$  cents per yd. How much would he get for what he has left at 13 cents per yd. and what would be his total gain?

5. (a) Multiply 0.00524486 by 0.99993682.

(Note.) Fifteen marks for this question if done by contracted method.

Seven marks for this question if done by ordinary method.

(b) Divide 0.30679006 by 0.27610603.

(Note) Fifteen marks for contracted method; eight for ordinary method.

6. Divide 18328 by the prime factors of 385 and show how to find the true remainder.

7. A can build a wall in 16 days; A and B in 10 days. After  $\frac{1}{2}$  of it is built, in what time can B finish it.

Values—1, 10; 2, 8; 3, 14; 4, 18; 6, 10; 7, 10; 5 as given above.

CANADIAN HISTORY—CLASS III TO IV.

1. Date the following. Champlain came to Canada. Champlain became Governor. Representative Government introduced. Union Act passed. Dominion of Canada formed.

2. Describe any two of the following:—Quebec Act, War of 1812-13. Rebellion of 1837. U. E. Loyalists.

3. (a) What form of Government have we in Canada?

(b) Who is Lieutenant-Governor of Quebec, Manitoba, and P. E. Island?

(c) Who is Premier of Ontario?

(d) Who is Premier of the Dominion?

(e) What are some of the conditions of the Union Act, and when passed?

(f) When was Canada formally ceded to England?

Values—1, 15; 2, 30; 3, 55.

REGULATIONS.

1. Each pupil must get 50 per cent. over the field and 25 per cent. on each subject, and at least 50 per cent. in spelling.

2 Teachers may prepare for themselves additional papers in 4th promotion to 5th Class; sending a copy of them to inspector.

3 Teachers will read and mark the papers and remit a report, together with the papers of the Candidates who pass, to the P. S. Inspector as soon as possible after close of Examination, and sign the following:

I certify that the Examination Papers were not opened until the morning of the Examination, and that the Examination was conducted fairly and honestly in every respect.

.....TEACHER

MANITOBA TEACHERS' EXAMINATIONS.

PROTESTANT SECTION.—1882.

ENGLISH GRAMMAR.

EXAMINER—A. BOWERMAN, M.A.

Time—Two Hours. Third Class.

1. Parse: The sun being now nearly twenty degrees above the horizon, our mountain shepherds thought themselves justified in leaving their flocks to graze a little while untended.

2. Analyze:—Having received the usual permission from the surgeon—there being no sickness on board—we cast anchor in the roads opposite St. James' Valley, within a quarter of a mile from the island.

3. Writ plural nominative of sheep, species, beau, cherub, solo. Mr.; the possessive singular and plural of chimney, sky, lass; the comparative and superlative degrees of: many, tedious, holy; and the past tense, present participle, and past participle of: rear, beseech, singe, dun, die, ply.

4. Correct any mistakes in the following sentences, giving your reasons:

1. I seen him a good ways up the street.
2. Me and you was both at school together.
3. That there figure didn't ought to have been subtracted.
4. That is a secret between him and me.
5. I did it just like you did.

5. Classify adjectives, and give an example for each class.  
6. (a) After what verbs is *to*, the sign of the infinitive omitted; (b.) What are the relative pronouns? Decline them and explain the difference in their use.

ENGLISH GRAMMAR.

EXAMINER—A. BOWERMAN, M. A.

Time—Two Hours—First and Second Classes.

1. This would surpass  
Common revenge and interrupt his joy  
In our confusion and our joy upraise  
In his disturbance; when his darling sons,  
Hurled headlong *to partake* with us, shall curse  
Their frail original, and faded bliss,  
*Faded* so soon. Advise, if this be worth  
Attempting, or to sit in darkness here  
*Hatching* vain empires.— Thus Beelzebub  
Pleaded his devilish counsel, first devised  
By Satan, and in part proposed: *for* whence  
But *from* the author of all ill, could spring  
So deep a malice, *to confound* the race  
Of mankind in one root, and earth with Hell  
To mingle and involve, *done all to spite*  
The great Creator?

—Milton, *Par. Lost.*

(a.) Analyze fully from: "Advise, if this be worth attempting," to the end.

(b.) Parse the words printed in italics.

(c.) Derive the following: Common, joy, frail, empire, malice, original, surpass.

2. By what tests would you decide a verb to be in the Subjunctive Mood.

Parse the verbs in the following sentences, giving reasons for the mood and tense you assign:

If he be here, I can not see him.

If he is here, he will tell all our secrets.

If he were here, he would speak.

If he had been ill, his friend would have written.

If he is stupid, that is no reason you should insult him.

3. Give a full and careful account of the form and functions of the Absolute construction in English. Give examples to illustrate, and compare with other constructions by changing from one to the other.

4. (a.) Accentuate: inventory, deficit, commandant, decorous, inquiry, desultory.

(b.) Does rise (noun) rhyme with pries or with mice?

Has the *s*, in excursion, the same sound as in evasion or as in in tension?

What word gives a correct rhyme with vase?

What word gives a correct rhyme with haunt?

(c.) What is the derivation of:

Sound, whole. Count, a title of honor,

Sound, a strait. Count to reckon.

Sound, a noise.

(d.) Why has coveted one *t*, and regretted two?

Why is courageous spelled *ous*, and grievous *ous*?

Why has millennium two *l*'s and two *n*'s?

5. Criticise and correct what you think wrong in the following. —

"You have hindered instead of helped me."

"Here lies John Brown, born July 25th, 1818, died October 12th, 1854."

"You have not acted like your brother did."

"John Milton, for some time Latin Secretary of the Commonwealth, and who wrote Paradise Lost, the greatest poem of this or of any other age, was born in London."

"Johnston's Lives is being reprinted."

"Sense and not riches win esteem."

"A boy of about 13 years of age, claiming to belong to Derby, Vermont, and that he was left by his father in the city, was found by the police on Maria Street."

"I would like to have you come."

6. Define with examples, Gerundial Infinitive, Auxiliary Verb Impersonal Verb, Substantive Verb, Verb of Incomplete Predication.

What is meant by Sequence of Tenses?

7. Explain the construction of the words in italics:—

He is taller *than I*.

*The more* he has, *the more* he wants.

*It was John* who did it.

### ENGLISH LITERATURE.

EXAMINER—T. C. L. ARMSTRONG, M. A., L. L. B.

Time—Two Hours.

1. Characterize briefly the early Anglo-Saxon poetry of England, and name some of the works and writers.

2. Write a short account of the origin and growth of the English Drama.

3. Name the authors of the following works, and ascribe each to its proper literary class: Ornnulum, Shepherd's Calendar, Edward II., The Tempest, Cato, Dunciad, The Excursion, Rokeby, Lycidas, In Memoriam.

4. What has been the influence of the Literatures of France, Germany, Italy and Greece, respectively on our Literature?

5. Which is the chief lyrical age of our Literature? Name some of our chief lyricists.

6. Describe and mention an instance of each of the following: Ballad, Metrical Romance, Sonnet, Ode, Epic, Monograph.

7. Name some of the novelists and historians of the 18th century with their chief works.

Compare Gray and Pope as poets.

### HISTORY.

Time—Three Hours. Third Class.

1. Give a brief description of Britain under Roman rule. What have we still in England to remind us of Roman occupation?

2. Mention the leading events of the reign of Henry I.

3. What is meant by The Hundred years' War? Give an account of any two battles fought in that war.

4. Describe briefly the struggle between Charles I., and his parliament.

5. Give an account of the Rye-House Plot and the Bloody Assize.

6. Mention the chief Legislative Acts of the reign of William III.

7. Sketch the Crimean War and the Indian Mutiny.

8. Describe Champlain's first voyage to Canada and give an account of the founding of Quebec with date.

9. Describe the capture of Quebec by the British.

10. Discuss the conduct of Lord Durham, Governor-General during the rebellion in Lower Canada.

11. Give the provisions of the North American Act and describe the assassination of Thomas D'Arcy McGee.

12. Write a brief account of the Red River Rebellion.

### HISTORY.

Time—Three Hours—Second Class.

1. Explain the following terms as applied to early English history:—*Aetheling*, *earl*, *churl*, *thane*. Explain also the nature of Government under the early Saxon kings.

2. Describe briefly the Conquest of England by William of Normandy. Give the conqueror's chief acts.

3. Describe the social condition of England under the Tudors.

4. Give an account of the Dutch War in the reign of Charles II., and give the provisions of the Treaty of Dover.

5. Give the main features of the following: Magna Charta, Habeas Corpus Act, and Petition of Rights.

6. Describe the battle of Culloden and explain the circumstances which led to this contest.

7. Sketch the Peninsular War and describe the battle of Waterloo.

8. Give a brief account of the career of Napoleon Bonaparte.

9. Describe the discoveries and explorations of Jacques Cartier and LaSalle.

10. Give an account of Pepperel's conquest of Louisburg. Give the conditions of the Peace of Aix la Chapelle with its date.

11. Describe the Rebellion in Upper Canada in 1836—37.

12. Give the main provisions of the Washington Treaty and mention the circumstances which led to its formation.

### HISTORY.

EXAMINER—REV. CANON MATHESON, B. D.

Time—Three Hours. First Class.

1. Give an account of the origin of the Greek race. Describe briefly the manners, customs and Government of Greece in the Heroic Age.

2. Explain the nature of the Peloponnesian war. Mention the chief men who figured in it. Describe the circumstances under which Greece became a Roman Province, giving the date.

3. When was the city of Rome built? Describe the grievances of the Plebeians in Rome and their efforts to gain their rights.

4. Give a full account of any two of the following battles: Heraclea, Trebea, Cannae, Actium. Name the principal Roman Prose writers.

5. Sketch the chief events in British History up to the time of the English Conquest.

6. Give some account of Dunstan and his administration. Write brief notes on Baeda's life.

7. Name the Sovereigns of the Tudor Period, giving their dates. Mention the various authors who flourished under the Tudors and their chief works. Give an account of the Star Chamber.

8. Describe the character of Oliver Cromwell. Discuss his foreign policy and his rule at home.

9. Describe the character and administration of Sir Robert Walpole. When did he live.

10. What events led to the Crimean War? Give a brief account of the principal battles fought and the persons who figured in them.

11. Name the principal discoverers and explorers who appear in early Canadian History. Give a full account of two of them.

12. When was the "Union of the Canadas" effected? Give the terms of union.

## GEOGRAPHY.

EXAMINER—E. L. BYINGTON, M.A.

Time—Two Hours.

1. Explain *Perihelion*, *Apogee*, *Solstice*, *Zodiac*, *Ecliptic*.
2. Classify Tides. Draw diagrams to illustrate. State their causes.
3. Show clearly why the Arctic Circle is  $23\frac{1}{2}^{\circ}$  (nearly) from the Pole.
4. If the earth's axes made an angle of  $30^{\circ}$  with a perpendicular to the plane of its orbit, what changes would follow?
5. What is the jurisdiction of the Dominion Government as distinguished from that of the Provincial Governments?
6. Where does Canada get her supplies of *Carpets*, *Sugars*, *Lace*, *Cork*, *Canned Salmon*, and *Wine*?
7. Name the Mediterranean seaports of Egypt, Spain, and France.
8. Name the cities on the *Rhine* and *Danube*.
9. Name the foreign possessions of France, Portugal, and Holland.
10. What are the forms of Government, Religion and Capital of each of the following countries: Egypt, Chili, Australia, Russia, England?
11. What and where are the following: Gallinas, Pamlico, Socotra, Elsinoro, Calgary, Prague, Riga, Miquelon, Auckland, Yellow-Head?
12. To what nation do the following belong: New Guinea, Hayti, Society Islands, Celebes, Heligoland, Sumatra, Ushant, Puerto Rico, Jersey Islands, Philippine Islands.
13. Name the Lake expansions of the Shannon and Ottawa rivers.

## COMPOSITION.

EXAMINER—STEWART MULVEY.

Time—Two Hours. Second and Third Classes.

1. State fully the uses of the following marks: —, ;, : , ? ! ( ) — “ ”
2. What is meant by direct and indirect narrative, by grammatical and rhetorical order; by variety in the structure of sentences? Give examples.
3. Write a short essay on one of the following:—  
“Modern Inventions.”  
“Character is a bundle of habits.”  
“Famous men.”

## COMPOSITION.

EXAMINER—J. B. SOMERSET, Esq.

Time—Two Hours. First Class.

1. Define the following, giving where you can, illustrative quotations or statements: Epigram, antithesis, irony, redundancy, tautology, paraphrase.
2. Point out any defects in construction or style that you may observe in the following, and re-write them, when necessary, in corrected form:
  - (a.) “Particularly as to the affairs of this world, integrity hath many advantages over all the fine and artificial ways of dissimulation and deceit; it is much the plainer and easier, much the safer and more secure way of dealing with the world; it has less of trouble and difficulty, of entanglement and prosperity, of danger and hazard in it.”
  - (b.) “We came to our journey's end, at last, with no small difficulty, after much fatigue, through deep roads and bad weather.”
3. Write an article, suitable for a newspaper or magazine on any one of the following:—  
“The Egyptian Question.”  
“The Commercial Relations of the Old and New Worlds.”  
“Immigration to the North-West.”

## SPELLING.

EXAMINER—T. L. O. ARMSTRONG, M.A., LL.B.

1. Mention some words of unsettled orthography. How does American spelling differ from English?
2. Account for the double letters in each of the following words: poor, beef, class, differ, deferring, proceed.

3. Account for any peculiarity in the spelling of the following words: dying, dyeing, knives, ladies, tongue.
4. Correct, where necessary, the following words: Inflammation, harrass, embaras, visitting, parrallel, consciencious, collonade, personelle, dipthong, metonymy, autonmy, dilligence, billious, biciclo, baillif, delible, irretreivable, tennant, manouvre, grievous.
5. Add each of the terminations *y*, *er*, *ed*, *ing*, where possible, to each of the following words separately, making words in ordinary use. Try, lie, lay, stay, centre, tre, have, car, sky, glass, gravel.
6. Write to dictation the passage selected by the examiner.

## BOTANY.

EXAMINER—REV. PROF. BRYCE, M.A., LL.B.

Time—One and a half hours—First Class.

1. Distinguish the stem from the root of the plant.
2. Describe a cotyledon, and show how the vegetable kingdom is divided on the basis of cotyledons.
3. What is meant by the “veining” of leaves, and explain the leading kinds of venation.
4. Explain the following terms applied to the shapes of leaves: Spathulate, sagittate, obovate, acicular and cuneate.
5. Describe the different parts of a stamen.
6. What are epiphytes and parasites, and give examples?
7. Give examples of plants that are sensitive to the touch.
8. Enumerate the varieties of underground stems.
9. How are fruits divided?

## CHEMISTRY.

EXAMINER—REV. PROF. BRYCE, M. A., LL.B.

Time—One and a half hours—First Class.

1. Name the four elements spoken of by the ancients, and show to what extent they were elements.
2. Show the distinction between chemical and mechanical union.
3. Describe the physical qualities of the elements of common salt, and give the combining equivalents and specific gravities of these elements.
4. Give an account of the manufacture and uses of sulphuric acid.
5. What is an alkali? What is the color of the flame of potash and soda respectively?
6. Give the physical qualities of phosphorus, and describe and explain the phenomenon of burning phosphorus in a limited quantity of air.
7. What are the sources of supply, mode of manufacture, physical qualities, and uses of Iodine?
8. Name the leading ores of copper and its chief combinations. How would you detect copper in a mixture?

## PHYSIOLOGY.

EXAMINER—REV. PROF. BRYCE, M.A., LL.B.

Time—One and a half hours—First Class.

1. Describe the bones of the human arm.
2. Give an account of blood corpuscles.
3. How is the blood propelled through the body and describe the mechanism of the organ which accomplishes this end?
4. Describe the lungs of a mammal, and show their use in the system.
5. What are the chief varieties of food stuffs?
6. Explain the use in the human organism of the gastric juice: of saliva; of the bile and pancreatic juice.
7. Explain shortly the process of digestion.
8. To what extent are animals warm, and how do you account for it?

## SCHOOL ORGANIZATION AND MANAGEMENT.

EXAMINER—THE SUPERINTENDENT OF EDUCATION.

Time—Two hours.

1. How would you endeavor to secure the co-operation of parents in the management of your school?
2. Discuss the daily marking of recitations?
3. How would you encourage cleanliness, punctuality, and honesty in pupils?

4. How would you begin to teach (a) Dictation, (b) Composition, (c) History?
5. Discuss Object Lessons?
6. Show how "copying" tends to produce general demoralization in a school. What means would you adopt to prevent copying?
7. Compare the respective merits of written questions and answers, and of oral questioning and answering.
8. In teaching spelling would you rely on one, or more, of the senses? Give your reason for doing so.

Additional questions for 2nd and 1st class candidates:

FOR SECOND CLASS.

9. What do you understand by a "good education"?

FOR FIRST CLASS.

10. Give some of the qualities of good reading. What peculiarities of pronunciation may be observed among pupils?
11. Who was Fröbel? What special advantage did he seek to gain by his system?

### Practical Department.

#### LESSONS IN CHEMISTRY.

(Continued from last month.)

The chemical combination and the volume of the (so-called) permanent gases, or perfect gases, like air, oxygen, hydrogen, nitrogen, carbonic oxide, and nitrous oxide are found to be regulated by simple laws. In the case of easily condensable gases like carbonic acid, hydrochloric acid, and ammonia, however, these laws do not hold with rigid precision when the gas approaches the condensing point, that is just before it becomes a liquid.

#### I. Boyle and Mariotte's Law.

The volume of a gas under constant temperature varies inversely as the pressure upon it, that is the volume becomes  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ , &c. of the initial volume as the pressure is increased to 2, 3, 4, 5, &c. times the original pressure: also the volume becomes 2, 3, 4, 5, &c. times the initial volume when the pressure on the gas is reduced to  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ , &c. of the original pressure. This law is fully discussed in Hydrostatics, to which the student should now refer for problems. He should also at this stage master the chapter in Hydrostatics on thermometers and thermometric scales, and become familiar with the metric system of weights and measures which is now generally adopted in scientific works.

No limit has been found to this law, the gas expands or contracts very nearly uniformly. If the volume is kept constant while the pressure increases or diminishes, then the density of the gas varies as the pressure, that is 2, 3, 4, 5, &c. times the original weight of gas, or  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$  times that weight are contained in the same space according as the pressure has been increased or diminished 2, 3, 4, 5, &c. times.

See Hydrostatics—specific gravity, air-pump, barometer, and problems. The standard pressure to which we reduce gases for comparison is a pressure equal to the weight of 760 millimetres (mm.) or about thirty inches of mercury. This pressure is observed by means of the barometer.

Examples. 100 cubic inches of nitrogen collected when the barometer stands at 28 inches will contract to  $\frac{28}{31}$  of 100 cubic inches when the barometer rises to 31 inches supposing the temperature to remain uniform.

Again, 100 litres of oxygen measured when the barometer stands at 760 mm. will expand to  $\frac{760}{758}$  of 100 litres when the barometer falls to 758 mm., if the temperature remains unchanged. Also, gas at 762 mm., mercurial pressure, will expand to  $\frac{762}{760}$  of its original vol-

ume when the pressure falls to 760 mm.; or gas at 760 mm. will contract to  $\frac{760}{762}$  of its initial volume when the pressure rises to 762 mm.

#### II. The Law of Charles and Gay Lussac.

The volume of a gas varies directly as its absolute temperature, which is found by adding 273° to the temperature by the centigrade scale, or 459° to the temperature expressed on the Fahrenheit scale.

It has been discovered that the following statement is very nearly correct for all permanent gases:

273 volumes at 0° C. become

274 " 1° C.

275 " 2° C., and so on without limit, increasing one volume for every rise of 1° C. in the temperature.

Also 273 volumes at 0° C. become

272 " - 1° C.

271 " - 2° C.

270 " - 3° C. and so on contracting one volume for every decrease of 1° C. in the temperature. If the law holds good beyond the temperatures we can actually reach by experiment, the volume of a gas must evidently cease to contract at - 273° C.

This temperature is therefore called the *absolute zero* and corresponds to - 459° F. Hence on the *absolute scale of temperature*, 0° C. is 273°, and if the absolute scale is taken from Fah., 0° Fah. is 459° on the absolute, and the rule given above is manifest.

Examples. 100 litres of gas collected at 15° C. what will be the volume at 20° C, the barometer remaining unchanged? The absolute temperatures are 15 + 273, and 20 + 273, i.e., 288° and 293°, and by the law of Charles the volume varies directly as the absolute temperature, hence 288 volumes will expand into 293 volumes, or 1 volume to  $\frac{293}{288}$  and 100 volumes to  $\frac{293}{288}$  of 100 volumes = 101·8 litres.

Again, 30 cubic inches of oxygen measured at 50° F., what is the volume when the temperature falls to 32° F.? The absolute temperatures are 509° and 491°.

Hence by the law 509 volumes will contract to 491

1 volume " "  $\frac{491}{509}$

30 cubic inches " "  $\frac{491}{509}$  of 30 cubic inches.

If, as is usual, corrections for both pressure and temperature are required we may easily combine the two results in one operation. Thus, 15 litres of hydrogen are collected under a pressure of 680 mm. and at 25° C. What volume will the gas occupy at 0° C. and 760 mm.? The pressure increases from 680 to 760, hence the volume decreases from 760 to 680, i.e., 15 litres become  $\frac{680}{760}$  of 15 litres.

The absolute temperatures are 298° and 273°, hence 298 volumes contract to 273, or 1 to  $\frac{273}{298}$  litres.

The standard temperature is the melting point of ice that is 0° C.

Hence the ( $\frac{680}{760} \times 15$ ) litres will become  $\frac{273}{298}$  ( $\frac{680}{760} \times 15$ ) = 12·293 or 32° F. Thus the *standard conditions* used for comparing gases are 0° C. and 760 mm. pressure, or in English measures 32° F. and 30 inches barometric pressure.

#### III The Law of Avogadro and Ampere.

The weights of equal volumes of all perfect gases under like conditions of pressure and temperature are precisely identical with their atomic weights. Thus:

44·4 cubic in. of hydrogen weigh 1 grain under standard conditions.

44·4 " " oxygen " 16 " " "

44·4 " " nitrogen " 14 " " "

44·4 " " chlorine " 35·5 " " "

and so on for all substances that can be reduced to the gaseous form. Similarly in French measures.

11.2 litres of hydrogen at 0° C. and 760 mm. weight	1 gram.
11.2 " oxygen " " " " "	16 " "
11.2 " nitrogen " " " " "	14 " "
11.2 " chlorino " " " " "	35.5 " "

In the case of compound gases, the molecule generally occupies the same space as a molecule of hydrogen.

Thus, 11.2 litres of hydrogen and 11.2 litres of chlorine give 22.4 litres, i.e., 2 (11.2) litres of HCl weighing  $1 + 35.5 = 36.5$  grams. Hence 11.2 litres of HCl weigh  $\frac{1}{2}$  of 36.5 grams = 18.25 grams, or one half the molecular weight of the gas. Again, twice 11.2 litres of hydrogen and 11.2 litres of oxygen unite to form 22.4 litres, i.e., twice 11.2 litres of steam, weighing  $2 + 16 = 18$  grams. Hence, 11.2 litres of steam weigh  $\frac{1}{2}$  of 18 grams, that is one-half the molecular weight of the gas. The same thing is true of nearly every compound gas, so that it is generally stated that the density (or number of times heavier than the same volume of hydrogen) of a compound gas is equal to half its molecular weight. When we remember that the atomic weight of a compound gas is half the molecular weight, we see that the law covers compound gases as well as simple ones. The molecule of an element is composed of two atoms as  $O_2$ ,  $Cl_2$ , &c., and the molecule of the compound gas occupies the same space as one of these, say the hydrogen molecule. Now it is the atom of hydrogen, not the molecule, which is taken as the unit, hence it is plain we must divide the weight of the compound molecule by 2 to compare it with the hydrogen atom. Thus carbonic oxide, CO, has two atoms in each molecule, one weighing 12 times and the other 16 times as much as the hydrogen atom. Each molecule of CO is therefore 28 times the weight of a hydrogen atom, but each molecule occupies twice the space that a hydrogen atom does. Therefore, as we compare equal volumes, the density of CO must be half of 28, or 14.

This law may be stated in several ways, but all amount to expressions of the same fact. The student should reduce the following statements to identities for himself. The weights of equal volumes of gases are identical with their atomic weights; equal volumes of gases contain the same number of molecules; the molecules of all gases occupy the same space; the densities of all gases are the same as their atomic weights; the densities of gases are half their molecular weights.

Phosphorus, arsenic, arsenic trioxide, zinc, cadmium, and mercury in the form of vapors seem to be exceptions to the law. The weight of one volume of each of the first three is the same as the weight of four volumes of hydrogen, while that of the rest is only equal to the weight of one volume of hydrogen instead of two volumes, as required by the law. These apparent anomalies may yet be explained as the science advances.

In many works the weight of one litre of hydrogen under standard conditions is called a Crith, so that 11.2 criths (nearly) = 1 gram or one crith = .0896 gram (nearly). Also, we have 16 criths of hydrogen = 1 crith of oxygen, 14, 35.5, &c. criths of hydrogen = one of nitrogen, chlorine, &c.

It is plain that if we divide the weight of a molecule by the weight of one atom the quotient is the number of atoms in the molecule, in other words the molecular weight divided by the atomic weight gives the number of atoms. We can therefore determine the formula of a compound if we know its percentage composition.

Thus, if a compound have 72.73% of oxygen and 27.27% of carbon, we have

$$\frac{72.73}{16} = 4.5456$$

$$\frac{27.27}{12} = 2.2725$$

That is, the number of atoms of oxygen is to the number of atoms of carbon as 4.5456 : 2.2725, or, allowing for errors in experiment, as 2 : 1. Hence the formula is  $CO_2$ ,  $C_2O_4$ ,  $C_4O_8$ , or generally  $C_nO_{2n}$ . The simplest formula is  $CO_2$ , carbonic dioxide.

The process is simply the converse of finding the percentage of each ingredient when the formula is known: see previous lessons.

(To be continued.)

## HOW TO TEACH COMPOSITION.

BY WILL. F. SMITH.

The teacher should give instruction to children of ten years of age and upwards on this all-important branch. Take a class of pupils whose members are capable of reading with ease, extracts from second reader. The first step is familiar conversation. Take some object with which the pupils are well acquainted and get them to tell you its parts and characteristics—e. g. The Cow.

Question—What has a cow?

1st pupil—Horns and ears.

2nd " —Eyes.

3rd " —Tail, legs and mouth.

Question—What are the eyes for?

Whole class—To see out of.

The teacher may here give briefly the real use of the eye and other organs. Bring up simple points as to the characteristics of the animal. Give a thorough drill on the subject and then say "Tell me what you know about the cow?" They have the ideas and need only express them. By practice they will be enabled to tell intelligibly what they know. Do not at first hamper them with grammatical accuracies. If you do, you will but intimidate. Your first object is to secure, on the part of the children, self-confidence in relative conversation. Subsequently you may correct any ambiguous or loose construction, but do not be too emphatic on this score or confidence will be lost.

When the second class pupils have been promoted to the third reader, the teacher should read an extract which is expressed in simple language and on some non-abstract subject. Let it be read slowly and emphatically in order to impress the ideas upon the pupils. Then order them to produce the extract in their own language. It will be well to put the extract in their hands after it has been read, so that it will be purely a test of practical language growth. Simple subjects should always be taken at first for it is a language test required and not an inquiry into the child's knowledge or an incentive to imaginative productions. The aim is to have simple thoughts expressed in plain simple language. It will be well to place suggestive headings on the board in connection with the subject named. This will not be telling but will lead out the ideas. The direction of the stream is given and the source will thus be the more easily discovered and its affluents explored. Attention must now be given to the construction of sentences. Hand in hand with the subject of composition should go the subject and study of grammar. They are twin sisters of sensitive natures and must not be roughly treated or separated.

In most cases the only training a child gets in this important branch is by a subject assigned to be written on at home. The pupil will perhaps bring in a scrawl of ten or twelve lines of which the last two will be the startling fact that "This is all at present." This performance occurs in most cases once a week. The teacher may glance over them and say that they must be longer next time and this is the last of the study of composition for that week. Such dallying as this will be of little avail, if any.

In teaching a third class this subject I would advise a course something like this. On your time table give this subject as much prominence as history or geography. Let there be a class session twice a week, one subject only to be considered for the two lessons. In the first lesson commence as you would with the second class—have a familiar chit chat on the subject. Draw out the ideas of the class individually. Place on the board one or two suggestive headings and ask the class for others. Having obtained a number of distinct leaders you may now search for the branches and twigs. Get all you can out of the class first and then draw out what is necessary by hints and suggestions. This accomplished, give a thorough drill on the ground gone over, and then dismiss the class. In the second lesson the teacher will repeat what was done in the first in order to save time. He will give what he considers necessary information and then order the class to "write upon the subject."

He should superintend and assist any one that is lagging, by a hint or two, and thus stimulate the class to exertion. About fifteen minutes should be allowed for the writing of the composition and ten minutes

for correction. The teacher will find a few or a great many mistakes common to the whole class. He should dwell upon these and have the pupils note them down with their other corrections. The teacher will now order the pupils to re-write their compositions at home. He will tell them to be very careful and not write down the mistakes instead of the corrections, and to bring in the matter in composition blanks neatly written. In this way the blanks will have a presentable appearance. The essay will not be compounded of sickly thoughts in garb so shattered as to render them the more repugnant by their uncounted exposure, but plain substantial ideas will be clothed in wholesome guise.

## Notes and News.

### ONTARIO.

J. H. Long, M. A., L. L. B., has been appointed to the assistant mastership vacated by Mr. Byington in the Cobourg collegiate institute. Mr. Long is a gold medalist in modern languages in the University of Toronto, and has had previous experience in work similar to that he is now undertaking. He has also enjoyed the great advantage of some years' experience as an examiner in his own university.

D. S. Paterson, M. A. (Tor.), has resigned the head mastership of the Catham high school, to the great regret of the community. Few teachers have the good fortune to give as unqualified satisfaction as Mr. Paterson has done, and he carries with him into another profession the best wishes of all who know him.

J. E. Hodgson, M. A., having resigned the principalship of the Brantford collegiate institute on his appointment as inspector of high schools, a worthy successor to him has been chosen in the person of W. Oliver, B. A. (Tor.) who removes from Bowmanville. Mr. Oliver's career as a teacher has been long and successful. He had charge for some time of the Oakville grammar school, and gave it up for Welland high school. He next moved to Bowmanville, where he has been for some years past, and during that time he has worked the high school there up to a state of great efficiency. Mr. Oliver has served as examiner in chemistry in Toronto university.

For a school in a small centre of population the Weston high school, under the management of its energetic head master, W. Wallace, B. A., has made for itself during the past term a very creditable record. Out of nine candidates sent up to the intermediate eight were successful. To the recent junior matriculation examination in the university of Toronto it sent up three candidates, who won five second and two first class honors. One successful candidate for first year standing in the same institution, and one for the primary examination in the Law Society complete an excellent list.

Mr. Barton, assistant master in Weston high school, resumes this year his course in Toronto University, and his place has been taken by Mr. Wm. Smith, an undergraduate in mathematical honors in the same institution. Mr. Smith holds a first class provincial certificate, and was formerly assistant in Caledonia high school.

Brockville high school opens this month under the head mastership of Rev. Clare L. Worrell, B. A. He graduated at Trinity College, Toronto, in 1873, having held the first place in his year throughout his university course and standing first in the first class mathematical tripos at graduation. He was for some years a successful master at Bishop's college, Lennoxville, Que. and began his high school career as mathematical master of the Cobourg collegiate institute. He was appointed head master of the high school, Gananoque in 1879, which position he has held until the present summer when the Brockville high school was offered to him. The acceptability of his services at Gananoque is attested by the fact that the Board of Education of that place passed, by a unanimous vote, a resolution asking him to reconsider his resignation and promising an increase of salary for the following year. Mr. Worrell, however, did not feel justified in relinquishing the opportunity for a wider field of labor which was presented at Brockville and so pressed his resignation. His pupils presented him with a very handsome silver card-receiver at the close of last term.

Mr. Worrell is not unknown in Brockville, having taken an active part for sometime in the Leeds county teachers' association in which he now holds the position of president.

Miss Jackson succeeds Mrs. Merrill as teacher in the lowest division of Uxbridge high school.

Thomas Scales, B. A., (Queen's) has been reappointed head master of Williamstown high school. His assistant is Mr. G. T. Lewis, undergraduate of Mount Allison college.

A. C. Crosby, B. A., head master of Smithville high school was presented by the pupils of his intermediate class with a very beautiful and costly arm chair. On the same occasion his assistant, Mr. G. J. Laird was made the recipient of a fine gold pen and holder.

Joseph Nason, B. A., has resigned his position as assistant in Vankleek Hill high school, and has accepted the second mastership of Orillia high school at a salary of \$700. Mr. D. C. Little succeeds Mr. Nason, at a salary of \$500.

Mr. C. A. Winter, first assistant in Waterloo central school has resigned. Previous to his leaving the profession his pupils presented him with a copy of the Canadian Portrait Gallery and an address speaking very highly of his ability and success. During his career as a teacher Mr. Winter won many friends by his kind, genial manner; and as secretary of the Waterloo teachers' association he earned the esteem and goodwill of the members.

Richmond Hill high school, under the head mastership of Wm. McBride, M. A. has been very successful lately. Four candidates sent up to the last matriculation examination passed, obtaining three second class honors. At the "Local examination for women" which was held in their own school, seven ladies wrote and all passed. The university record since last September is four first-class honors, three second class, one \$170 scholarship, five for matriculation and seven at local examination for women. Every one sent up succeeded. Well done, Richmond Hill, teachers and pupils!

Inspector J. J. Tilley, Bowmanville, was the chairman of the Examining Board at the recent intermediate examination, and before separating, the examiners who performed the laborious duties of examining and marking the papers of the 3,300 candidates who wrote, unanimously passed and tendered to Mr. Tilley the following resolution of thanks:—"Resolved—that the thanks of the Board of Sub-examiners be tendered to Mr. Tilley for the uniform courtesy and ability with which he has directed the progress of the examination, and has, thereby, not only much facilitated the execution of a work tedious and laborious in its nature, but has also shortened the time which would otherwise have been consumed in its accomplishment."

We are pleased to note the well-deserved appointment of Mr. Isaac Wood to the head mastership of Kingston model school. His promotion from the principalship of one of the city schools is a record of success and shows the esteem in which he is held by the local educational authorities. His predecessor, Mr. D. McArdle resigned the position, as he is, we understand, about to go to Manitoba.

Mr. Colin Scott has been transferred from the principalship of the Louise public school to be assistant in the model school, and is succeeded by Miss Holmes of Toronto as lady-principal.

Inspector Kidd of Kingston has been highly complimented by his school board on his efficient services and has received a tangible token of their appreciation in the shape of an increase of salary.

It is said that at the end of this year Kingston collegiate institute will take rank as a high school.

Miss Palmer has resigned her position in the Richmond Hill high school and her successor is D. B. Kerr, B. A. (Tor.) First Proficiency Scholarship man at matriculation and a first-class honor man in modern languages. The salary of Mr. W. McBride, M. A., the head master, has been increased from \$1000 to \$1100.

The inspector's annual report for the county of Lanark is before us, and we are pleased to observe that since the appointment of F. L. Michell, B. A. as inspector, a great improvement in attendance of pupils, discipline, accommodation and other important matters, has taken place. In his efforts to secure a better state of affairs it is gratifying to see that the school trustees are actively seconding him. Under such able management Lanark will shortly "come to the front."

H. L. Dunn, B. A., has been appointed to the classical mastership of Lindsay high school.

Mr. Smith has accepted the position of principal of Oshawa high school, vacated by the appointment of W. W. Tamblin, M. A. to Bowmanville high school. Mr. Smith has been classical master in Guelph high school.

J. M. Clark B. A. has been appointed mathematical master of St. Mary's collegiate institute. He is spoken of as an accomplished scholar and will prove a valuable aid in a school which is already well supplied with teachers who are earning a first-class reputation for the establishment.



## NOVA SCOTIA.

The third annual meeting of the teachers' association for inspectorial district No. 7 (Cape Breton and Richmond counties), was held in the new academy, Sydney, on the 22nd and 23rd of June. The Superintendent of Education, Dr. Allison, and the inspector of schools, Mr. M. J. T. Macneil were present and contributed greatly to the interest and success of the meeting. The latter gentlemen presided *ex officio* over the association, Mr. C. P. Moore was chosen Vice-President and B. McKittrick, B. A., Secretary-Treasurer. The following constitute the executive committee. Miss A. H. Hamilton, Miss A. C. Jost, and Messrs. C. F. Cameron, J. L. Kelly, D. R. McLellan, with the executive officers. Seventy-eight teachers were enrolled as members. The formal exercises opened with a paper on "Reading" by Mr. C. F. Cameron. The writer advocated strongly the simple and natural method of beginning with the easy and proceeding to the more difficult. On this ground both the alphabetic and phonic methods of teaching the elements of reading were condemned. The paper elicited much hearty and profitable discussion. Mr. C. P. Moore followed with a paper on "Drawing," in which he advocated the introduction of industrial drawing into our schools both on educational and utilitarian grounds. The Superintendent of Education expressed earnest concurrence in the spirit and scope of Mr. Cameron's essay, and while proud of our school system as a whole feared that in this respect we were in danger of being surpassed by the schools of other countries. This paper also was earnestly discussed. At the opening of the afternoon session Mr. D. R. McLellan presented a paper on the "Unitary method" in arithmetic, coupled with instructive, illustrative exercises. Dr. Allison pointed out that the utility of the unitary method became apparent when we reflected that in solving a problem the great point was to get in a central position from which we could view it in all its bearings. Other speakers followed with interesting remarks and criticisms. Some unavoidable cause having broken up the rest of the regular programme for the afternoon, several educational topics of importance were discussed in an informal manner. The evening session was held in the Temperance Hall. Inspector Macneil efficiently presided, and after an introductory song from an excellent choir, introduced the Superintendent of Education, whose address was an exposition and defence of our system of schools with some suggestions for its improvement. He appreciated the sympathy expressed rather than felt for the "three R's," but did not regard those useful branches as exposed to any danger from studies equally useful. Each age has its characteristics and its necessities. It is no disrespect to the memory of great and good men who have passed away to say that what did for them will not do for us. Nova Scotia in view of the needs of the present hour must educate her children as well as rival communities are educating theirs, or fall behind in the race of progress. He paid a warm compliment to the people of Sydney for the noble edifice which they had consecrated to the interests of education.—Rev. Messrs. Smith (Episcopalian) and Farquharson (Presbyterian) moved and seconded a heartily adopted vote of thanks to the Superintendent. The next day's exercises were ushered in with a paper on grammar by Mr. C. F. Hall. The essayist ably discussed some of the deeper mysteries of the science of language. A lively discussion sprang up, participated in by Dr. Allison, Mr. McKittrick, Mr. Blackett and others. "Cramming" formed the subject of the next essay, which was prepared and read by Angus Chisholm, B. A. In a striking manner the evils of the undigested cramming of verbal formulae were pointed out and the nature of valid educational processes unfolded. Dr. Allison agreed with all the speaker had said but thought there was some danger of going to the other extreme and undervaluing, and therefore neglecting the memory, one of the most marvellous of our intellectual faculties. Other speakers followed all conceding great excellence to Mr. Chisholm's paper. In the afternoon Mr. B. McKittrick, B. A. discussed the subject of geometry and the normal method of teaching it. He advocated teaching the fundamental truth in preliminary oral lessons with copious concrete illustrations. This was followed by the concluding exercise of the association, an essay on "School hygiene" by Mr. C. W. Blackett. This subject, which was very ably treated, was enforced in some earnest and eloquent remarks by Inspector Macneil in which he gave the teachers present excellent practical advice. A noteworthy feature of the association was the large attendance, as spectators, of ladies and gentlemen interested in education. Many of the foremost professional men of Sydney honoured the teachers with their presence and kindly words of cheer. The closing exercises of the Provincial normal school were held on the 11th of July. They fully sustained the reputation of the institu-

tion. The order of proceedings, as far as students' exercises were concerned, was as follows:—(1) Lessons in Decimals, by Mr. Bowles of Cornwallis; (2) Lessons on the Lover, by Miss Crowell of Barrington; (3) Lessons in Drawing, (from dictation) by Miss Palfrey of Lawrencetown; (4) Lessons in Zoology, by Mr. McDonald of Margaree; (5) Lessons in Geography (Egypt) by Miss Freeman of Liverpool. These lessons, while unequal in merit all bespoke faithful work on the part of the normal school faculty. The Principal J. B. Calkin, M. A. reported the total number of enrolled pupil teachers for the year as 121, with an average attendance of about 100. The number reported as receiving diplomas, or certificates of professional classification, was 81, classified as follows: 6 grade Superior; 47 grade Good; 28 grade Fair. The names and averages on professional work of the winners of Grade Superior are as follows:—Miss Freeman, Liverpool 80; Miss Jackson, Cornwallis 78; Miss Crowell, Barrington 78; Miss Robertson, Barrington 76; Mr. J. D. McLeod, St. Anns C. B. Mr. W. H. Magee, Cornwallis 75. The following head the list in the record of general scholarship with an average of 75 and upwards; Miss Crowell 79.4; Mr. W. H. Magee 79.3; Miss Jackson 79.2; Miss Freeman 77.9; Miss Robertson 77.2; Miss Miller, Stellarton 76.3; Miss Hamilton, Steniack 75.6; Mr. D. McD. Clarke, West River, 75.2; Miss Clarke, West River, 75; Mr. J. D. McLeod, 75. The Governor-General's medals were won as follows: Silver medal Miss Crowell; Bronze medal, Miss Jackson. The medals not having arrived, certificates of award were presented to the above young ladies by his honor the Lieutenant-Governor, whose presence graced the occasion, as it has done for many years, the closing exercises of the institution. The subject of the essays written in competition for the medals was "Pestalozzianism and modern methods of education." The adjudicating committee consisted of Rev. Dr. Sawyer, President of Acadia college; Mr. R. Murray, editor of the *Presbyterian Witness*, and the Superintendent of Education. The portions read of the prize essays conveyed a very favourable impression of their literary merit. At the conclusion of the formal exercises, brief addresses in response to invitations from the Principal were delivered by Lieutenant-Governor Archibald and Dr. Allison, Superintendent of Education. The reporter of one of the Halifax papers summarizes their remarks as follows; "The Governor drew a graphic picture of the progress of education in the province, and paid a warm tribute to the excellent moral tone which has characterized the normal school from its first establishment. Incidentally, his Honor expressed himself as strongly in form of university consolidation. Dr. Allison briefly referred to a still desirable elevation of public sentiment in respect to the appreciation and remuneration of teachers' services. Both speakers gave expression to the universal feeling of the large audience that the exercises of the students were exceedingly meritorious." In the afternoon a number of graduates of the normal school met and organized a society of Alumni, with officers as follows: President, E. M. Chesley, M. A. Yarmouth; Vice-President, H. Waddell, Halifax, Secy-Treasurer, W. Mortimer McVicar, Truro. The society proposes to benefit their *Alma Mater* and promote good fellowship by an annual celebration and dinner.

It is understood that the Church of England synod of the diocese of New Brunswick has recognized the theological department of King's college, Windsor, as the Divinity School of that Diocese. An application for similar recognition has also been made to the Diocese of Newfoundland.

Four candidates wrote at the recent examination for the Gilchrist scholarship at Halifax.

The annual Encenial exercises of King's college, Windsor, were held on the 29th of June. The sermon required by statute was preached in the Parish Church by the very Rev. Canon Dart, President of the university. The learned preacher eloquently expounded the relations, harmonies, and differentiating conditions of science and religion. At the Enconia proper the President delivered an interesting oration on the cultivation of a literary taste. The exciting subject of a year ago, collegiate consolidation, seemed entirely lost sight of. His lordship Bishop Binney, and Rev. Mr. Brigstocke, Rector of Trinity Church, St. John N.B. also delivered addresses. A number of degrees both in *curso* and *pro honoris causa* were conferred.

On a recent visit to Cape Breton, the Superintendent of Education pronounced the new academy at Sydney, as, next to the Halifax high school and the Pictou academy, the finest academic structure in the province.

The third annual session of the Provincial Educational Association was held at Truro on the 12th and 13th of July. It was attended by nearly 300 members either teachers or others directly connected with the work of education.

An essay on "Technical education" by Dr. J. Gordon McGregor of Dalhousie college, has been published and extensively circulated. It epitomizes with great clearness and precision the history of educational development in this important direction. It shows what Nova Scotia is not doing.

The third annual session of the Provincial Educational Association was held at Truro on the 12th and 13th of July. At 9 a. m. on Wednesday the 12th, the Superintendent of Education, as *ex-officio* President of the Association, called the members to order in the spacious Assembly Hall of the Provincial normal school. In his opening remarks he congratulated the Association on the success of its past meetings, on its growing influence for good, and on the auspicious circumstances under which it now convened. He wished members to claim and exercise complete freedom of speech on discussing all legitimate educational questions. The report of the executive committee, embracing a duly audited account of the year's receipts and expenditures, and a carefully prepared programme of exercises for the present session was prepared by the secretary of the committee, Mr. A. McKay. On motion the report was unanimously received and adopted.—Mr. A. McKay (Halifax High School) and Mr. B. McKittrick, B. A. were unanimously re-elected to the positions of Secretary and Assistant Secretary. Prof. Walter Smith, State Director of Art Education, Massachusetts, was at this point introduced to the Association, and proceeded, in accordance with the programme, to deliver an address upon the subject of drawing in schools. The specific title of Mr. Smith's lecture was "Definition of Industrial Drawing: How Industrial Drawing should be taught, and who shall teach it." In developing his subject, he sought to dissipate prevailing misconceptions regarding it. He clearly defined and illustrated the distinction between strictly artistic culture and the instruction possible in the ordinary schools of a country. Industrial drawing, as he aimed to make it general and popular, was something simple—a power to give clearness to the vision and precision to the touch. It was not a recondite accomplishment, impossible to the many. It was a faculty which all human beings of reasonable endowments can attain unto. The value of sense education was unfolded and eloquently insisted on. The closing part of the lecture dealt with the practical side of the subject. Mr. Smith exhibited a large number of illustrations representing the elementary steps in industrial drawing and showing what could be accomplished by regular teachers in connection with their ordinary school-room work. The futility of employing a class of specialists to do what regular teachers can be trained to do much more effectively was earnestly dwelt upon by the speaker. The first part of the afternoon session of Wednesday was devoted to practical exercises in teaching. Lessons were given in botany, mineralogy, and elocution by two teachers of the Model Schools connected with the provincial normal school, Misses Hamilton and Church. These exercises received careful attention from the large and deeply interested audience. After a brief recess, the report of the committee appointed last year by the Association to prepare a course of study for high schools and high school departments, was submitted to the chairman, Principal Calkin of the provincial normal school. In presenting the report, Mr. Calkin briefly indicated the difficulties encountered by the committee and the methods by which it had been sought to fairly compromise between conflicting views. Printed copies of the high school course were laid upon the table, and afterwards distributed among the members, as a part of the report of the committee. Mr. E. J. Lay (Amherst academy, in opening the discussion on the proposed course, expressed himself in terms of general approval. He vindicated the place assigned to classical studies. Mr. McKay (Secretary) vigorously impeached the arrangement of subjects in the course, so far as the natural sciences were concerned. The natural order was not observed, neither did the course articulate harmoniously with the preceding common school course. Mr. McKay (Pictou academy) spoke earnestly in defence of the course, particularly in view of the criticisms of the last speaker. He urged that in the common schools sufficient knowledge of the elementary parts and principles of science was obtained to enable pupils to take up the assigned subjects with profit. On motion, the discussion was adjourned. The evening session (Wednesday) was held in the hall of the Y. M. C. A. to enable the people of Truro to share with the association the pleasure of listening to Walter Smith's lecture on "Art Edu-

cation in its relation to Industrial Development and Household Taste." The chair was occupied by the Superintendent of Education. The audience was one of the largest ever assembled in Truro. Among others present was His Honor the Lieutenant-Governor. In the first part of his lecture, Mr. Smith gave an interesting history of the development of art education, particularly of industrial drawing as a branch of common school instruction, and traced the effects of this development on the progress and wealth of nations; in the latter, he dwelt with great humor and instructiveness on aspects of art education related to domestic economy and enjoyment. The lecture was illustrated by a superb collection of drawings from the normal art school, Boston. The proceedings of Thursday morning's session were opened with the reading of a paper on "Internal School Management" by C. W. Roscoe, M. A., inspector of schools, in which much sound thought was displayed and many valuable suggestions made as to the best methods of securing the healthful growth and development of mind and body. The speaker showed that unity of aim and effort on the part of all interested in carrying forward the work of education is necessary. The powers, prerogatives and duties of teachers were clearly defined. The legitimate means of securing proper attention to study in school were represented to be the instinctive love of knowledge, or curiosity, force of example, the desire of achievement, and, under proper regulation, the principle of emulation. The above paper, which was most attentively received, was followed by an object lesson in insectology by Miss Fletcher of the model school. This lesson served as an appropriate introduction to the next exercise, which was the reading of a paper by A. H. McKay, B. Sc., entitled "Notes on the Natural History of the prescribed common school course." It is impossible in this brief extract to do justice to this elaborate and excellent essay. At the close of the session the Superintendent of Education said he hoped that Mr. McKay might be induced to prepare a brief manual for the guidance of teachers on the natural history subjects of the common school course. This subject was warmly received by the association. The first part of the afternoon session was occupied by Prof. Smith, who delivered his closing address to the association on the subject of "Method" in teaching drawing. His remarks were exclusively directed to the teachers present, and were to the point. A hearty vote of thanks was then presented to the professor, which the president supplemented with a few words expressing appreciation of Mr. Smith's services. On motion of Inspector Condon, seconded by Inspector Mackenzie, the association unanimously resolved to ask the Council of Public Instruction to take steps whereby the teaching of industrial drawing shall become general in the schools of Nova Scotia. At this point a ballot was taken from members of the executive committee, with the following result: A. H. McKay (Pictou), Dr. Hall, Prof. Eaton, A. McKay (secretary), Inspector Roscoe, Inspector Condon, E. J. Lay. The whole of the closing session (Thursday evening), with the exception of a few minutes devoted to necessary routine, was occupied with the resumed discussion on the course of study for high schools. Prof. Eaton submitted a modification of the committee's course. He proposed to make Latin a compulsory subject, and would prefer to discard Greek altogether. Mr. Denton (Kentville), thought that no simple course would meet our educational circumstances. We have different grades of high schools or academies. Some were capable of more advanced and more varied work than others. This fact should be recognized in formulating a curriculum. The president (Dr. Allison), thought that a well devised course would serve as a high school test. If institutions called themselves high schools, and yet did not, and could not do high school work, it was time their pretensions were abated. He deprecated the suggestion of making Latin a compulsory subject, not because he did not appreciate Latin himself, but in view of a wide-spread public opinion which it was vain to combat. Mr. McKay (Pictou), in answer to Mr. Denton said the committee had done the best they could, but had never contemplated making a course which would enable one man to do the work of two or three. Mr. Waddell (Halifax high school), thought that the two courses, common school and high school, needed re-adjustment so far as the study of history was concerned. There was too wide a gap between the "Brief History of England" and Sumner's "Outlines of the World's History." Pupils on this plan would have but an inadequate knowledge of their own country. Mr. Cameron (Yarmouth), expressed the opinion that the scientific provisions of the course had been criticized with undue severity. He saw no reason why astronomy should not have a place in such a curriculum. The stars above our

heads were as well worthy of study as the worms beneath our feet. After some further discussion, the course was submitted for further revision to a committee to be named by the president. Thus closed a most successful session of the association. 290 enrolled members were in attendance. Of these, upwards of 250 were teachers in active service.

Rev E M Keirstead, M. A., has been appointed professor of metaphysics and English literature in Acadia College. Prof. Kierstead assumes the chair recently occupied by Dr. J. G. Schurman. He is a graduate of the university of New Brunswick and of Newton Theological seminary. Albert Coldwell, M. A., has been appointed instructor in natural sciences in the same institution, Acadia College.

### QUEBEC.

#### QUEBEC PROVINCIAL ASSOCIATION OF PROTESTANT TEACHERS.

This body held its nineteenth annual meeting in the school room attached to St. Peter's church, Sherbrooke, July 4th, 5th, and 6th. The proceedings were opened by the president, R. W. Henneker Esq., D. C. L., chancellor of Lennoxville, on the evening of the 4th. The attendance of teachers at the first session was small but each succeeding session showed a considerable augmentation. A large number of the influential citizens and clergy, were present at each session and evinced a warm interest in the several subjects. Among the occupants of the platform at different sessions were the Hon. G. Ouimet, superintendent of public instruction, the Lord Bishop of Quebec, Principal Dawson, of McGill college, E. J. Hemming Esq., Drummondville, the Revs. Arch. Duff, C. P. Reid, S. Brock, and Inspector Hubbard, Sherbrooke.

The secretary, Rev. E. J. Rexford, M. A., drew attention to the programme, read several letters from friends in Canada and the United States regretting their inability to attend, and gave a resume of the work performed by the executive committee. John Harper, B. A. Rector of Quebec high school read an admirable paper on "Cause and effect in school-work," which was well discussed. Miss Henderson of the girl's high school read a well written paper on "Scott's Lady of the Lake, with an elementary class," which also led to an interesting discussion as to the age when such a subject might be presented. Miss Francis of the McGill normal school, followed with a paper on "How to teach Analysis." Mr. J. L. Robertson of the CANADA SCHOOL JOURNAL, gave an address on "Primary Reading" which was much appreciated. Miss Sloan of the McGill model school then read a paper on "How to teach object lessons, and illustrated her method by giving a lesson on wheat to a class of boys whom she kept thoroughly interested. Miss Reid succeeded her with a valuable paper on "How to keep the little ones employed." A committee on resolutions was appointed consisting of the following gentlemen: Dr. Kelley, Montreal, Messrs. R. M. Campbell, Three Rivers; J. Harper, Quebec; H. Hubbard and J. H. Forde, Sherbrooke; J. Masten, Coaticook, Curtis, St. John's; and Graham, Huntingdon. Mr. R. W. Henneker, D. C. L., then gave the presidential address on "Competitive and qualifying examinations" which, judging from the applause it frequently received, gave general satisfaction. Miss McGann, of the Mackay institute, Montreal, read a most interesting paper on "Visible speech" and afterwards illustrated her system of instruction by introducing a deaf boy, (son of a Sherbrooke citizen,) who pronounced audibly some extremely difficult words, Latin quotations and colloquial phrases, written in a peculiar caligraphy on the blackboard. She also by lip movement held a conversation with him. Everyone appeared intensely pleased with the great and peculiar success of the system she exemplified. The Hon. G. Ouimet, superintendent of public instruction, whose appearance was greeted with considerable applause, next addressed the meeting, first in English, afterwards in French. His eloquence seemed to inspire the audience, for the enthusiasm was loud and frequent. He dwelt particularly on the progress of education in the Province, the importance of the teacher's work and the improved prospects of the teacher. The time and place of next meeting caused an animated discussion and it was eventually decided to meet at Lachute, October, 1883. The election of officers resulted as follows:—President, Dr. Christie; vice-presidents, Alderman J. C. Wilson, Rev. E. J. Rexford, and Mr. J. Masten of Coaticook, secretary, Dr. Kelley; treasurer, Mr. C. A. Humphrey; executive committee, Dr. Robins, Rev. Principal Holmes, inspectors McLaughlin and McGregor, Misses Henderson, Sloan, Francis and Hill, Messrs. Rowell, Kneeland, Harper, Campbell, Halliday, Forde, and Curtis. A very important discussion on "How to make

the *Educational Record* useful to teachers" was introduced by R. W. Boodle Esq. B. A. editor, and some practical steps were taken to promote the success of this able, useful and instructive periodical in the Province. Mr. F. C. Emberson gave a brief address on "Chronologico-symbolic aids in teaching history," after which Mr. R. W. Boodle read an excellent paper on "The necessity of reform in English grammar," which elicited an interesting discussion. Mr. R. M. Campbell adverted to the Pension Act and was replied to by the Hon. G. Ouimet. The committee on resolutions then presented their report, at the conclusion of which principal Dawson gave an admirable address bearing on the position of Protestant education, the duties of teachers, the principles of instruction and the evil of cramming. He was followed by an address from Mr. E. J. Hemming on the importance of the rudiments of a good English education being well attended to in public schools. After a vote of thanks to the Hon. the superintendent of public instruction for his presence, kindly sympathy, and substantial assistance, the convention was closed by benediction pronounced by the Lord Bishop of Quebec.

Rev E J. Rexford, M. A., late head master of Montreal high school has been appointed secretary of the department of Public Instruction for the Province of Quebec. This appointment has given great satisfaction to the teachers of the Province, by whom Mr. Rexford is universally respected; and a cordial resolution expressive of their pleasure was passed at the late convention of the Provincial Association of Protestant Teachers, of which he was Secretary. Dr. Kelley succeeds Mr. Rexford in the headmastership.

### MANITOBA.

#### WINNIPEG TEACHERS' ASSOCIATION.

At the regular meeting of the City Teachers' Association, held in Mr. McIntyre's class room, Central School, Mr. N. Howitt, introduced the subject of writing, which was followed by an interesting discussion in which Messrs Somerset, McIntyre, Hunt, and Miss Shore took part. This was followed by a paper on music, read by Mr. Hunt, explaining the Tonic Sol-fa System. After a short discussion it was decided to introduce the system in the schools after the mid-summer vacation.

The following resolution, moved by Mr. E. A. Blakely and seconded by Mr. E. S. Garratt, were then carried unanimously:—

"That we the members of the Winnipeg Teachers' Association desire to take this opportunity to record our approval of the course adopted by the Inspector, Mr. T. B. Somerset, in endeavoring to work up the city schools to a more thorough state of efficiency, and to express our willingness to heartily co-operate with him in all his earnest efforts in that direction.

"We would further wish to give expression to the very high esteem in which he is held by us, not only as an efficient public officer, but also as a Christian gentleman. He has been among us only a short time, but during that time he has established for himself a reputation for thoroughness which augurs well for the future prosperity of our schools.

"We consider our school authorities are to be congratulated on having secured the services of such an able and practical gentleman to assist in moulding the destiny of the educational institutions of this young province."

### ONTARIO TEACHERS' ASSOCIATION.

The annual meeting of the Provincial teachers' association of Ontario took place in the Public Hall of the Education Department on the 8th, 9th, and 10th of August. The President, Archibald McMurphy, M. A., presided and delivered the usual address, in the course of which he gave a valuable and interesting review of the educational work in the different English speaking countries. He strongly advocated a form of teacher's agreement, in which no definite time would be specified, the understanding being that the engagement was to last as long as the teacher continued to give satisfaction. He discussed the danger of mixing up politics with education, and favored a return in Ontario to the administration of the Department by an officer who would not be mixed up in party political struggles. He discussed also the use of the Bible in schools and thought the law should be amended so as to require moral and religious instruction to be given in all schools unless when a vote of the people in any locality declared otherwise.

During the afternoon of the first day's meeting Mr. F. S. Spence, of Toronto, gave an address on "School hours and vacations,"

The address was highly practical, and gave rise to an interesting discussion, which indicated that Mr. Sponco spoke the views of his fellow-teachers generally. He cautioned teachers against endeavoring by means of physical exercises to recuperate exhausted mental energy. He would like to have the vacation period fixed at a time when there was no farm-work to be done, for children should have a rest as well as the teachers. With reference to " cramming," he thought the aim should be to shorten the hours, not lessen the intensity of the application to work. Short lessons and long intervals should be the rule in all primary classes. Two hours a day was enough time for pupils in the first book, this increased by half an hour a day for each division would bring the school time to what it is now for the junior fifth-class pupils of say 13 years of age. Outside supervision was one of the most important duties of the teacher. He looked upon schools and teachers as necessary evils, since they were used for doing work which properly devolved upon the parent. He objected to the imposition of work by way of punishment, and advocated the substitution of gymnastic drill for the short recesses.

On the afternoon of the second day a committee, consisting of Messrs. Fotheringham, Johnston (Belleville), Millar, Alexander, and McHenry, was appointed to frame a suitable resolution of condolence on the death of the late Dr. Ryerson, and to forward it to the family of the deceased.

G. W. Ross, M. P., gave an admirable address on the subject, "How to make teachers' associations more useful." He advocated the holding of township institutes, and of longer sessions of the wider associations which should be held once a year. The programme of these meetings should be comprehensive and practical, and subjects outside of the teacher's immediate work should occasionally be selected. Subjects should be allotted only to those who consented to take them up, and then the engagement should be strictly kept. He would introduce the United States institute plan of having the subject introduced amidst a running fire of questions from members by means of which all would be drawn into the discussion. He would like to have the attendance of the teachers made compulsory, and concluded by expressing his high appreciation of the association as a means of self-improvement amongst the teachers.

An address was delivered during the evening by J. A. McCabe, LL. D. principal of the Ottawa normal school, on "The Schoolmaster abroad." After referring to some general principles connected with education, he contrasted the use made of text-books in former days with the use made of them now. A text-book he defined to be an artificial reservoir—often an empty and muddy one—of facts. He advocated the phonetic method in teaching reading. The best teachers should be placed in charge of the lower divisions in a school, as the great work of the teacher was to create a thirst for knowledge, and train the pupils to habits of observation.

The report of the committee appointed to consider the suggestions in the President's address was then submitted and adopted. The most important part is as follows.—"In view of the very great evils which seem to have resulted in the United States and other countries from the introduction of politics into educational matters, your committee trusts that all true friends of our school system will unite in discountenancing every influence tending in that direction. The number of schools opening with religious exercises is happily on the increase, and your Committee is of the opinion that it is desirable that a suitable selection of Scripture lessons should be incorporated in our Readers, and that the sentiments of the President's address are strongly endorsed; that any one who cannot reverently, humbly, and lovingly read the Scriptures is not fit for a teacher."

The afternoon of the third day was taken up with an address of a general character from Dr. Goldwin Smith, and a paper by Professor M. McVicar on "Inductive and deductive methods in education." Dr. Smith after a brief reference to educational matters in England, and to the university and public library questions in Canada, expressed the opinion that perfect liberty of action to the people of each locality was the best solution of the difficulty about the introduction of the Bible into the schools. He did not favor the re-establishment of the Council of Public Instruction as an administrative body, but thought some such body would serve a useful purpose in other ways. Professor McVicar's paper was a thoughtful and suggestive one, but it was at the same time unsuitable for being intelligently summarised.

In the evening Mr. W. H. Howland gave an address on "Temperance in the public schools." He stated that in Toronto an incredible number of youths were learning drinking habits. In England they had school-books on temperance which taught that alcohol was a poison and a producer of disease instead of an article

of food and a producer of strength. This closed the proceedings of the general convention.

#### PUBLIC SCHOOL SECTION.

In this section the chief topics of discussion were (1) Public examinations, which was introduced by Mr. Richard Lewis, of Toronto, (2) the granting of higher certificates as the result of successful teaching, introduced by Mr. S. McAllister of Toronto, (3) the new public school programme, which came up in connection with the report of a committee appointed to consider it, and (4) the demand made on teachers for information by the Bureau of Industries. The opinion of the section was unfavorable to the conversion of public examinations into mere exhibitions and a motion in that sense was carried. After a good deal of discussion a motion was carried in favor of raising a teacher's certificate one grade by examination after five years of successful teaching and another grade after three years more. A good deal of doubt was expressed as to the expediency of allowing so much control over subjects of study to remain with parents and trustees without an appeal to the inspector and this view was finally adopted by resolution. The work required by the circulars of the Bureau of Industries was regarded in the light of a hardship in view of the already small salaries and hard work of the teacher.

#### INSPECTORS' SECTION.

In this section after some discussion and the reception of a committee report on the subject a resolution was passed in favor of making promotion examinations general with a caveat against making success at these examinations the great aim of school-work. It was also resolved, after discussion, that it would be better to have reading, writing, arithmetic, spelling, grammar, composition, and geography made compulsory in the programme. The committee on teachers' associations reported that in order to a full and regular attendance at the associations they recommend that the programme be made eminently practical and interesting. That inspectors should use every suitable opportunity in meeting with trustees or teachers to impress the usefulness of the meetings on those who attend them, and urge on the teachers the duty to themselves and their profession in respect of their contributing to the work at the meetings. That some means should be adopted to bring the absence of the teachers from the regular meetings of the association to the knowledge of their trustees. That periodicals or books should be supplied to the members in whole or in part from the funds of the association. That in counties where a central point is not easily reached, a general county convention should be held once a year, and a local association in each township in the other half year; that in regard to the programme the non-professional part should be subordinated to the professional. It is desirable that classes of pupils from the schools be brought to the meeting for the purpose of practical illustrations of methods of teaching. Where it is impracticable to bring pupils to the place of the meeting it is a good alternative to form classes of the teachers in attendance. The association should provide means of assisting members in their individual difficulties by opening a question drawer. The interest seems to be best maintained in this feature of the programme, where questions are admitted up to the end of the first day of the convention, and answered at a certain time on the second day.

The following resolution was adopted:—That in the opinion of this Section it is advisable that the professional examination of third-class teachers be uniform throughout the Province, and that the papers be prepared by a committee of public school inspectors.

#### HIGH SCHOOL SECTION.

A resolution was carried in this section looking to the holding of the intermediate and University Examinations at different dates so as to enable pupils to try to pass both. A motion by J. Millar M. A. calling the attention of Toronto University Senate to the desirability of admitting male candidates to the local examinations was left over till next year. Steps were taken to ask the University Senate to issue more specific instructions as to the junior and senior matriculation examinations, with regard to the manner in which the papers are to be set and the values assigned. A paper was read by G. H. Robinson M. A., of Whitby on the intermediate examination. He traced its history from its institution in 1875 and its influence on high school education to the present time. He next discussed the effects of the change made by the new regulations which were summed up as follows:—

1. It will probably lessen the pressure of work both upon teachers and pupils.

2. It will probably enable masters to give more time to purely English subjects.

3. It will moderate professional jealousies and abate, if not entirely remove, those unhappy evils that have arisen out of the intermediate.

4. It will permit in some degree a measure of play to the individuality of the teacher and pupil.

The defects of the scheme he thought were :—

1. It will destroy the uniformity of the system.

2. It will discourage the study of classics, mathematics, modern languages, and probably also history and geography.

3. By allowing many options to all pupils and the university and professional examinations requiring their full quota of subjects, it will prevent effective classification, and in the majority of schools will leave many of the pupils unemployed.

4. It will to a very large extent leave secondary education to the whims and fancies of ever-changing school boards, and the likes and dislikes of frequently changing masters.

5. It will by allowing so many options practically place secondary education in the hands of parents often not competent to decide upon such important matters, which in many instances will mean in the hands of the pupil himself.

6. It will prevent the awakening and recognition of exceptional talent in many subjects.

7. It will have a serious effect upon the volume and value of the University supply.

8. And lastly, but by no means wholly, it will unsettle the public mind as to the status of secondary education. He concluded by suggesting a slight modification of the old intermediate as preferable to that proposed, or a modification of the scheme developed by the Senate of Toronto University for the guidance of Upper Canada College. He was not in favour of the intermediate as a basis of classification in the high school, but if it was to be obligatory he would like to see it as little hurtful as possible. The reading of the paper was frequently interrupted by applause, and Mr. Robinson was asked to have it published.

## Announcements.

### EDUCATIONAL CHANGES.

The changes made in the educational system of this Province by the following regulations are neither few nor unimportant. They affect the programmes of high and public schools, the status and qualifications of teachers, the powers and duties of inspectors, the mode of distributing the high school grant, the list of text books, and the machinery for imparting to teachers a professional training. That modifications so extensive were not made without a good deal of investigation and deliberation goes without saying, and it is not easy to see in each case whether change and improvement are synonymous. That some of the changes are in the right direction is apparent at a glance, as for instance the placing of the Provincial normal and model schools under one official head. Heretofore there has not been uniformity in the methods pursued in these institutions; hereafter this desideratum will be secured under the able supervision of Dr. McLellan, who has been appointed to the newly created office of "Director" of the normal and model schools. Apparently the mode of distributing the high school grant, while it tends to increase the salaries of the masters, will leave a portion of the sum unexpended unless it is reduced by the Legislature. How would it do to utilize this unexpended portion to encourage the development of special lines of high school work in the more enterprising institutions? Payment by results having been abandoned as the general principle of distribution, and there being a want of provision for special courses in high schools generally, much good might be done in this way at a trifling cost to the country :—

### HIGH SCHOOL PROGRAMME.

#### LOWER SCHOOL.

I. The subjects of study which are obligatory upon all High School Boards are as follows :—

1. English Grammar.
2. English Literature.
3. Composition.
4. Dictation.

5. History and Geography.
6. Arithmetic and Book-keeping.
7. Drawing.
8. Drill and Calisthenics.

II. The subjects of study which are optional with High School Boards are as follows :—

1. Algebra and Euclid.
2. Natural Philosophy, Chemistry, and Botany.
3. Latin and Greek.
4. French and German.
5. Music.
6. Physiology and Hygiene.
7. Principles of Agriculture.
8. Household arts—as Sewing, Cooking, and Housekeeping.

III. While all High School Boards are required to afford secondary instruction in classes in the obligatory subjects above prescribed, each Board may arrange, according to the particular circumstances of its school, the order in which such subjects are taken up, the amount of work and time to be given, and the number of classes.

IV. High School Boards are not required to provide means of instruction in all of the optional subjects of study above authorized, but only in such as in the judgment of each Board the occasion or circumstances of their school render expedient.

#### INTERMEDIATE EXAMINATION.

V. The true object of this examination being to test the fitness of each pupil to proceed from the Lower to the Upper School, it shall be regulated so that any pupil of moderate capacity may, after the requisite period of study, pass in the most essential of secondary branches in the Lower School. The obligatory subjects of such examination are therefore limited to the following :—

1. English Grammar.
2. English Literature.
3. Composition.
4. Dictation.
5. Arithmetic.
6. Drawing, and

7. To one of the following subjects or groups of subjects at the option of each pupil, viz :—

- (a) Algebra and Euclid.
- (b) History and Geography.
- (c) Any two of the following three :—  
Natural Philosophy, Chemistry, Botany.
- (d) Latin.
- (e) Any two of the following three :—  
French, German, Music.

VI. The Education Department will prescribe by Regulations the principles to govern in the preparation of questions, the reading and values of answers, the conditions of passing, and the time and mode of conducting the examinations.

#### UPPER SCHOOL.

VII. The subjects of study in the Upper School shall be those prescribed for the Non-Professional Examination for First-Class Public School Teachers' Certificates, and for Junior and Senior Matriculation in the Provincial University, in the case of pupils preparing for any such examination. In the case of other pupils, any parent or guardian, after consultation with the Head Master, and with his approval, is at liberty to select for his child or ward one or more of the following subjects, as may best suit the purposes of such pupil, viz :—

1. English Language and Literature.
2. History.
3. Arithmetic and Algebra.
4. Any of the following :
 

French,	Geography,
German,	Natural Philosophy,
Latin,	Chemistry,
Greek,	Botany,
	Geology and Mineralogy.

VIII. Head Masters are at liberty to continue in the Upper School any subject of the Lower School which they may think fit.

IX. High School Boards are not bound to provide instruction in all the authorized subjects of study in the Upper School, but are entrusted with full discretion to afford instruction in such subjects only as they may consider necessary in the particular circumstances of their school.

X. The foregoing shall take effect at and from the end of the summer vacation.

PUBLIC SCHOOL PROGRAMME—PART I

SUBJECT.	1ST CLASS.	2ND CLASS.	3RD CLASS.	4TH CLASS.
READING—	Tablet Lessons and First Reader.	Second Reader.	Third Reader.	Fourth Reader.
SPELLING—	Spelling from reading lessons.	Spelling from reading lessons.	Spelling, with elementary verbal distinctions.	Spelling. Verbal distinctions. Simple derivations.
WRITING—	Elementary writing.	Writing on slates and paper.	Copy writing. Business forms.	Copy and miscellaneous writing.
ARITHMETIC	Numeration and notation to 1,000, addition and subtraction.	Numeration and notation to 1,000,000, multiplication and division.	Greatest common measure and least common multiple. Vulgar fractions. Elementary decimals. Elementary reduction.	Vulgar and decimal fractions continued. Reduction & Compound Rules. Elementary percentage and interest.
DRAWING—	Elementary figures, straight lines and their simpler combinations.	Elementary figures, straight lines and curves, and their simpler combinations.	Copying drawing. Drawing from objects.	Drawing from objects. Shading. Elementary perspective.
GEOGRAPHY—	Elementary ideas concerning the earth, and directions upon it.	Local geography and elementary definitions. Map of the world.	Definitions. Simple map. Geography N. America & Canada. Map drawing.	Geography of North and South America; Canada & Ontario. Map drawing.
MUSIC—	Rote singing of simple songs.	Singing of simple songs.	Simple songs. Elementary ideas of written music.	Song singing. Sacred music. Musical notation.
GRAMMAR AND COMPOSITION—	Oral and written exercises in language.	Oral and written exercises in language.	Analysis of easy sentences. Simple descriptive writing.	Analysis. Rendering poetry into prose.
HISTORY—	.....	.....	.....	Leading features in English and Canadian history.
OBJECT LESSONS—	Counting—(beans, pebbles, etc.) Form, Size, Color, Weight. Common objects (parts and qualities).	Lessons on common objects (parts, qualities, and uses).	Common objects. (Source, manufacture, uses, &c.) Animals, birds, plants.	
TEMPERANCE AND HYGIENE—	.....	.....	Occasional lessons and familiar lectures.	Occasional lessons and familiar lectures.
DOMESTIC ECONOMY (FOR GIRLS)—	Threading needles. Hemming, <i>e.g.</i> , strips of calico, or a plain pocket handkerchief. Knitting—a plain strip.	Hemming, Seaming, or Sewing. } <i>e.g.</i> , a child's pinafore. Fixing a hem. } Knitting—a ribbed muffatee.	Hemming, Seaming, } <i>e.g.</i> , a pillow case. Felling, Stitching, } Sewing on strings. } Knitting—A child's plain sock.	Button-holing. } <i>e.g.</i> A plain day or night shirt. Sewing on buttons, stroking, setting in gathers, marking. Plain darning. Knitting—a ribbed stocking.
DRILL (WITH CALISTHENICS FOR GIRLS)—	<ol style="list-style-type: none"> <li>Teachers to take their own boys and form into squads according to strength. Then into squads with intervals, and put them through the following portions of Squad Drill:—Position of the soldier; standing at ease; dressing a squad with intervals; turnings; extension motions; saluting; instruction in marching; balance step, without advancing; advancing; the slow march; the halt; stepping short; stepping out; marking time; stepping back; changing feet; quick march; side, or closing step; turning when on the march; squad drill in single rank; marching and turning; marching as in file; diagonal march.</li> <li>The boys to be ranged in companies, sized from both flanks, and told off in companies, half-companies, sections, and practised in the marches and variations of step which have been taught in single rank; the formation of fours; increasing and diminishing front; wheeling; forming company square.</li> <li>Calisthenics for girls.</li> </ol>			

FOR FIFTH AND SIXTH CLASSES.—PART II

*Reading*—Fifth Reader, and critical reading from selected standard English works.  
*Spelling*—Prefixes, Affixes, and Roots. Verbal distinctions.  
*Writing*—Miscellaneous and business forms.  
*Arithmetic—5th*—Interest, discount, percentage, stocks, loss and gain, square root.  
*Arithmetic—6th*—Stocks, partnership, alligation, cube root, etc.  
*Drawing*—Object drawing, shading, drawing animals and plants; perspective.  
*Geography*—Geography of the world. Political geography. Physical and mathematical geography.

*Music*—Musical notation, more commonly occurring keys. Singing sacred written music. Transposition from one key to another.  
*Grammar*—Analysis and parsing. Transposition. Writing essays.  
*History—5th*—Outline of Canadian and British history.  
*6th*—Outline of Grecian and Roman history; British and Canadian history.  
*Algebra—5th*—Four elementary rules. Easy simple equations.  
*6th*—Simple equations and easy quadratics. Problems.  
*Geometry and Mensuration*—Euclid, Books I., II. Areas of rectilinear figures. Volumes of prism, cone, sphere, etc. Areas of simple surfaces.

## THE PROVINCIAL NORMAL SCHOOL.

## I.—As to Second Class Certificates.

The present Regulations in the Compendium of School Law (1878, pages 189 to 191) are to remain in force, excepting where varied by the following:—

1. There shall be two sessions in each of the Provincial Normal Schools in each academic year for the professional training of Candidates for Second Class Public School Teachers' Certificates: the first session shall begin on the forenoon of the second Tuesday of September, and continue until the afternoon of the first Friday in February following (excepting during the High School Christmas vacation); the second session shall begin on the forenoon of the first Tuesday following the first Friday in February, and shall continue until the afternoon of the third Friday of June.

2. The subjects of instruction shall include the principles and theory of education, school organization, discipline, and government. A Course of Lectures shall also be delivered in the Elements of Psychology, where requisite arrangements can be made.

3. In addition to such strictly professional training, instruction shall continue to be given, as provided for in the existing Regulations, in Mental Arithmetic, Practical Chemistry, Music, Drawing, Hygiene, Drill and Calisthenics. And generally the Masters shall aim at developing the partial and imperfect attainments of the students in different departments of learning, into a higher and more complete knowledge.

4. The regular Masters in each Normal School shall consist of three, being the Principal, Science, and Mathematical Masters, whose respective duties will be defined by the Education Department; and the supervision and direction of the work of the Principal and Masters of each Normal School is hereby entrusted to Dr. McLellan, one of the High School Inspectors, subject to the instructions of the Education Department.

## II.—As to First Class Certificates.

5. Whenever the requisite funds are supplied by the Legislative Assembly, there shall be a session for the professional training of Candidates for First Class Public School Teachers' Certificates, at the Education Department, from the second Tuesday of September until the Christmas vacation.

6. Such Candidates shall receive instruction in the branches of professional study prescribed in the existing Regulations contained in the Compendium of School Law (pages 192 and 193), according to the Course or Syllabus from time to time approved by the Education Department. They are also required to attend the Course in Psychology (except those who may have done so previously).

## III.—As to High School Teachers.

7. In order to become the Head Master of a High School or Collegiate Institute, the following qualifications are required of each candidate:—

(1) Having regularly graduated in the Faculty of Arts of some University in Her Majesty's dominions, and having also furnished satisfactory evidence to the Education Department that he has either taught successfully for two years as a legally qualified Assistant in one or more of the High Schools of this Province, or is the holder of a First Class Public School Teacher's Provincial Certificate.

8. In order to become an Assistant High School Master, the following qualifications are required:—

(1) Being the holder of a First Class Public School Teacher's Provincial Certificate; or

(2) Having regularly graduated in the Faculty of Arts of some University in Her Majesty's dominions, and also having obtained the Professional Certificate required for First Class Public School Teachers; or

(3) Being an Undergraduate in the Faculty of Arts of any such University of the standing of the fourth year, and having duly passed the examination prescribed at the end of the third year, and also holding a First Class Professional Certificate as a Public School Teacher; or

(4) Special Certificate may be granted by the Minister upon the recommendation of the High School Inspectors, when the special circumstances of a particular school are shown to justify this; but any such special Certificate shall be valid only in and for the particular school in respect of which it may be granted.

9. The foregoing shall take effect on and from the end of the summer vacation, but shall not affect any certificates of qualification heretofore granted by the Education Department.

## COLLEGIATE INSTITUTES.

I. The following conditions are required from each Collegiate Institute now existing for its continuance, and for the establishment and continuance of any new Collegiate Institute, namely:—

1. Suitable School buildings, out-buildings, grounds, and appliances for physical training.

2. Laboratory, with all necessary chemicals and apparatus for teaching the subject of Chemistry properly.

3. Four Masters at least, each of whom shall be specially qualified to give instruction in one of the following departments:— English, Classics, Mathematics, Natural Science, and Modern Languages: the teaching staff of the Institute being such as to provide the means of thorough instruction in all the departments mentioned.

4. The excellence of the school, as required by the foregoing, must always be maintained to justify the special grant in each year.

II. No new Collegiate Institute shall be established unless all of the above conditions are complied with; and unless the yearly salaries of the four specially qualified Masters required by condition (3) amount in the aggregate to the sum of \$5,000 at least.

III. In case it shall appear, after due inquiry, that any Collegiate Institute has made default in the performance, observance, or fulfilment of any of the conditions of these Regulations, or in maintaining the proper standard of efficiency, the Lieutenant-Governor in Council may withdraw its status and rights as a Collegiate Institute.

IV. The foregoing are intended to apply to each Collegiate Institute now existing, or newly established, on and from the 1st of January, 1883, or as soon thereafter as these Regulations may be ratified by Resolution of the Legislative Assembly.

## CONDITIONS FOR OBTAINING PUBLIC SCHOOL TEACHERS' CERTIFICATES.

## I.—For Third Class Certificates.

1. The existing Regulations shall continue in effect, except as hereinafter varied.

2. Every Candidate for a Non-Professional Third Class Teacher's Certificate must pass the Intermediate Examination prescribed by the Amended Regulations respecting the course of study in High Schools, and an additional examination in the following subjects:—

(1) Mental Arithmetic.

(2) Two of the optional subjects or groups of subjects so prescribed for the Intermediate Examination, in addition to the one taken by such Candidate at his Intermediate Examination, provided that the groups of Algebra and Euclid, and of History and Geography, and of Physiology and Hygiene must be taken, either at the Intermediate or additional examination.

## II.—For Second Class Certificates.

3. Every Candidate for a Non-Professional Second Class Teacher's Certificate, who has passed the examination for the Non-Professional Third Class Teacher's Certificate, may present himself at the next or any other subsequent yearly examination for Non-Professional Second Class Teacher's Certificates.

4. The subjects for the Non-Professional Examination of Second Class Candidates shall be the same as those required to be taken by Candidates for Non-Professional Third Class Certificates, but the questions shall be separate and distinct, and of a higher standard.

5. The times of these Non-Professional Examinations shall be in the same week, and as far as may be, concurrent with the Intermediate.

6. A female Candidate may, at either of the above-mentioned examinations, substitute for Algebra one of the subjects of French, German, Music, or Botany, in which she has not been examined for the Intermediate.

7. The foregoing shall take effect at and from the end of the summer vacation.

## III.—For First Class Certificates.

8. Whenever the Session for the professional training of First Class Candidates at the Education Department is established, each Candidate will be required to attend and to pass an examination in the work of the Session, and this condition shall apply to all grades of First Class Certificates.

LIST OF TEXT-BOOKS IN BOTANY AND AGRICULTURE.\*

I. PUBLIC SCHOOLS.

1. Public School Boards and Trustees are now authorized to require Teachers in their employment to give occasional lessons in Elementary Physics and Principles of Agriculture. The following Text books are therefore recommended and authorized for their use, as well as that of pupils receiving such instruction :— Any Canadian or English editions thereof :—

	MAXIMUM RETAIL PRICE.
Introductory Primer. By Huxley.....	\$0 30
Chemistry " By Roscoe.....	0 30
Physics " By Stewart.....	0 30
First Principles of Agriculture—by Henry Tanner, F.C.S., Examiner in Principles of Agriculture, under the Government Department of Science, England.....	1s. 6d., or 30 cts.

II. HIGH SCHOOLS.

1. High School Boards are now authorized to provide means of instruction in Botany and Principles of Agriculture as optional subjects. The following Text Books are therefore recommended and authorized for use in High Schools, as well as in the 5th and 6th classes of the Public Schools :

2. In Botany—The Elements of Structural Botany, with Special Reference to the Study of Canadian Plants. By Professor Macoun and H. B. Spotton, M.A. .... 90 cts
3. In Agriculture—(1) First Principles of Agriculture, by Henry Tanner, F.C.S., Examiner in Principles of Agriculture, under the Government Department of Science, England..... 1s. 6d., or 30c.
- (2) For advanced pupils only—Elementary Lessons in the Science of Agricultural Practice, also by Henry Tanner. 3/6 stg. : or \$1.05.

DISTRIBUTION OF HIGH SCHOOL GRANT.

I. The annual Legislative Grants to High Schools and Collegiate Institutes shall be distributed on the following basis, viz. :—

A. HIGH SCHOOLS.

1. Every High School shall receive a fixed grant of \$500, provided it has at least one assistant teacher who is
  - (a) A Graduate of a University, or
  - (b) An Undergraduate of the fourth year's standing, or
  - (c) The holder of a First Class Provincial Certificate.
 If this condition be not complied with the minimum grant shall be \$420.
2. Every High School that has at least three qualified instructors shall receive, in addition to the fixed grant, 45 per cent. of the amount by which the aggregate sum paid annually for Teachers' salaries shall exceed \$2,000—this additional grant is in no case to exceed \$750.

B. COLLEGIATE INSTITUTES

3. Every Collegiate Institute complying with all the conditions prescribed by the Education Department shall receive
  - (1) The fixed High School grant of \$500.
  - (2) In addition, as in the case of High Schools, 45 per cent. of the amount by which the aggregate sum paid annually for Teachers' salaries shall exceed \$2,000, but this additional grant is in no case to exceed \$750.
  - (3) An additional grant of 33 1/3 per cent. of the amount by which the aggregate sum annually paid for Teachers' salaries shall exceed \$5,000—this additional grant is in no case to exceed \$750.

II. This Distribution shall be made by the Education Department half-yearly during the respective periods ending on the 30th of June and 31st of December.

III. The foregoing shall take effect on and from the 1st of January, 1883.

THE HIGH SCHOOL GRANT AND MASTERS' SALARIES.

The following circular which has been sent out to the parties interested speaks for itself. It deals with a subject of the greatest importance to all high schools :—

Galt, August 21st, 1882.

Sir :—

At the meeting of the High School Section of the Ontario Teachers' Association, the new regulations for the distribution of the Legislative Grants to High Schools and Collegiate Institutes were discussed.

It was felt that even if the principle of the distribution were acknowledged as fair and true, the proposed application of it would bear adversely upon many of the smaller Schools, and upon most of the larger Schools and Institutes.

A modification of the Minister's scheme was finally agreed to; and a Committee consisting of Mr. WILLIAMS, of Collingwood, Mr. HUNTER, of Waterdown, and the subscriber, was appointed to wait upon Mr. Crooks and lay before him the views of the Masters.

This modified scheme is set forth in the following resolution :—

"That inasmuch as the proposed scheme will bear hardly upon the smaller Schools, and also upon many of the larger Schools, all of which have been doing work worthy of Government encouragement, therefore the High School Masters' Section respectfully recommends that the Minister of Education modify his proposed scheme as follows .

- (1.) Every High School to receive a fixed grant of \$500.
- (2.) Every High School employing at least two teachers to receive, in addition, 25% of excess of amount paid for salaries above \$1500; but the maximum grant under this head to be \$125.
- (3.) Every High School employing at least three teachers to receive, in addition, 40% of the excess of the amount paid for salaries above \$2000; but the maximum grant under this head to be \$1000.
- (4.) Every Collegiate Institute to receive, in addition, a fixed grant of \$500.
- (5.) Every Collegiate Institute to receive, in addition, 20% of excess of amount paid for salaries above \$5000; but the maximum grant under this head to be \$250.

[It will be seen that the sliding scale runs in clause (2) from \$1500 to \$2000; in clause (3) from \$2000 to \$4500; and in clause (5) from \$5000 to \$8250; and that the seeming hiatus is filled by the special grant under clause (4).]

Furthermore, that if the Minister cannot see his way to the adoption of this modification in its entirety, this Section is of the opinion that it should be adopted in spirit, so that the method of distributing the grants should recognize the claims of the smaller Schools, and that the encouragement given by the Government should be continuous from the smallest School to the largest and best equipped Schools."

It will be noticed that the scheme as proposed by the Masters breaks down the invidious distinction between High Schools and Collegiate Institutes. A High School will be encouraged by Legislative aid until the annual amount paid by it for salaries is \$4500. Then, if otherwise it complies with the regulations and is acknowledged a Collegiate Institute, it will at once be able to pay \$5000 for salaries; since it will then receive \$500, the fixed grant for each Collegiate Institute.

The Committee are anxious to obtain the fullest possible information as to the probable effect upon each school of the modification proposed by the Masters, and therefore respectfully ask you to answer the following questions :—

- (1.) What was the total Legislative grant to your School for the year 1881 ?
- (2.) What was the total amount paid for salaries in your School in and for the year 1881 ?
- (3.) What is the yearly fee charged to your pupils ?
- (4.) What is the approximate average attendance ?

Also, the Committee will be obliged if you state whether you think the "modified scheme" (1) more equitable than that proposed by the Minister; (2) fair and equitable in itself.

Again, supposing, as is possible, the amount of the Legislative appropriations is not large enough to warrant the Minister in adopting this modification in its entirety, be kind enough to state what you think would be the fairest re-adjustment of it, keeping in view the claims of all the Schools, and the principle of the continuous sliding-scale.

If possible let your reply be sent to the undersigned not later than the first of September.

Respectfully yours,

JOHN E. BRYANT,  
Chairman of Committee.

To the Head Master or Principal

of.....

\*Flomling's "Analysis of the English Language" has been removed from the authorized list of text books.



## ONTARIO DEPARTMENTAL REGULATIONS.

## COUNTY MODEL SCHOOLS.

1. Besides the existing County Model Schools now established, when, from the large area and population of any county, it is necessary to establish more than one Model School thereon, a fourth Model School or schools may also be established by the County Council, with the approval of the Education Department.

2. In the case of two or three contiguous counties, of small area and population respectively, and when for this reason it may be unnecessary that a Model School should exist in each county, the Councils thereof may mutually agree to establish a Union County Model School for such counties, subject to the approval of the Education Department.

3. No Public School shall become a County Model School unless the following requisites are complied with:—

(1) Every Head-master must hold a First-class Provincial Certificate, and there must be three assistants at least, each holding a Provincial Certificate, but any Head-master who has hitherto efficiently discharged the duties of a Model School Principal shall not be affected in his present position.

(2) In all cases where County Model Schools are established in Union Schools, the Public School classes must be conducted so as to be practically independent of the High School classes, and the Head-master of the Public School department and his assistants shall respectively hold the qualifications above prescribed.

(3) The Public School should be provided with one room for each class or division thereof, and also with all requisite educational appliances, so soon as the Public School Board can do so conveniently, having regard to the resources of their school.

(4) A room should also be supplied, in which the Head-master may give professional instruction to the teachers in training, and as it may be separate from the Public School itself, such room can in most cases, be obtained for the session, without expense, in some public hall in the municipality. As the professional instruction to be so given by the Head-master in his capacity of Principal of the County Model School, is essential to the training of students therein, it shall be the duty of the Public School Board to leave him free to give at least two hours each day to the supervision of the teachers-in-training while they are engaged in actual teaching.

4. Instead of two terms of two months each, as at present, there shall be one session of three months in each year, beginning on the morning of the second Tuesday in the month of September, and thence continuing into the month of December for the period of about thirteen weeks.

5. As the Third-class Teachers' non professional certificate should, under the amended Regulations, represent sufficient knowledge in the subjects of the High School course, the work of instruction in the County Model School is to be deemed the professional complement requisite for a full third-class certificate.

The professional work of the County Model School is intended to develop the imperfect knowledge of the student into the more logical knowledge of the teacher, and shall include:—

1st. *Special reviews of the branches taught in the first four classes of the Public Schools, especially Reading and Mental Arithmetic.*

2nd. *Physiology and Hygiene.*

3rd. *Principles of Education, School Organization, Management and Discipline.*

4th. *Methods of Instruction.* The best methods of teaching the various subjects prescribed for the first four classes in the Public Schools, special attention being given to the best methods of giving the first lesson in these subjects.

5th. *Observation and Reporting.* (a) Observation of methods illustrated in the Principal's model lessons, (b) observation—under the Principal's supervision when possible—of methods illustrated by the assistant Model School teachers. And reporting to the Principal the results of their observations, especially as to (a) the object of the lessons observed, (b) steps by which this object was attained.

6th. *Practice in Teaching.* After proper instruction and examples in methods, each teacher in training shall have practice in applying the methods exemplified (a) by using his fellow students as a class (b) by teaching a class of pupils—say 10 or 12—before the Principal or some other competent critic, (c) by teaching in the several divisions of the school. No teachers-in-training should be required to practise as (a) in actually teaching any subject till the best method of presenting the subject has been explained and actually exemplified by an experienced teacher. Also, practice as in (a) should precede practice as in (b), and practice as in (b) should precede practice as in (c).

6. The teachers in training should employ their whole time, during the term of the Model School, according to a time-table to be drawn up by the Principal and approved by the Minister, and the Principal shall keep a register to show the actual progress of each teacher in training, and it is also the duty of the Principal to see that every teacher in training is thoroughly instructed and trained in the work of the course as prescribed in Regulation 5.

7. The present syllabus of lectures, at page 245 of the Compendium, is intended to be revised, but it should, in the meantime, continue to form the ground work of the Principal's instruction, except where, in his judgment, it would conflict with the course of training prescribed in Regulation 5.

8. In any county where there are two or more Model Schools the County Board shall assign to each such number of applicants as the capacity of the school will permit of, and in cases where there may be a deficiency of room in any Model School, to accommodate all the applicants, the County Board may give preference of admission to such candidates as have gained the highest number of marks at the non-professional examination for third-class certificates.

9. The Principal shall report to the County Board of Examiners, at the close of the session on the fitness of each candidate, according to a form to be provided by the Department. The teachers-in-training shall be subjected to oral and written examinations at the end of the session by the County Board of Examiners, who shall, upon the Principal's report and the results of the examinations, taken together, decide to whom certificates shall be awarded.

10. All County Boards of Examiners are authorized, by resolution of such Board, to require from teachers-in-training in their County Model School the fee of five dollars per session for instruction therein.

11. The Legislative and Municipal Grants, as well as all sums from fees for instruction shall be payable to the Public School Board, to be applied for the satisfactory maintenance of the County Model School, according to the conditions and standards prescribed by these regulations, for the professional training of candidates for third-class public school teachers' certificates.

12. The inspection of the Model Schools shall be governed by the Regulations of the 20th September 1879, but the Minister is authorized, with the approval of the Education Department, to appoint any one or more Inspectors, in order, through him or them, to secure a uniform standard and system of operations, as well as to afford useful information to County Boards, Public School Inspectors, and Principals, in regard to the conduct of such schools, and other matters relating thereto.

13. The foregoing shall take effect on and from the end of the Summer vacation.

## 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.

LANARK.—The annual meeting of this society was held at Almonte on the 25th and 26th May. A large number of teachers were present and took a lively interest in the work presented. After the reading of the minutes by the secretary, Mr. John Thornton, Perth public school, F. L. Michell, president of the association, delivered an address on the subject of teachers' institutes. He dwelt particularly upon the benefit which the teacher may derive both intellectually and practically, by a careful attention to the subjects discussed, and strongly urged upon the teachers the necessity of attending at least one meeting each year. Mr. Whittington, B. A., head master high school, Almonte, then introduced the subject of grammar, dwelling more particularly upon the subjunctive mood. By a well arranged scheme he showed that the indicative mood is used in true or probable propositions whilst the subjunctive is employed when the statement is false, improbable or impossible. Mr. Whittington treated the subject in his usual clear and comprehensive style, and elicited the commendation of those present. Mr. Boldy, of the Pakenham school, gave a practical paper on elementary bookkeeping. He indicated his method of introducing this subject to a class, and his blackboard proved him master of this subject. Mr. Anderson opened the afternoon session by an excellent paper on "How I teach writing." By illustrations on the blackboard he exemplified the main features of his method. He spoke against the use of the new head-lined copy-books, and strongly recommends the teacher to set the copies for the pupils. He said that proficiency in this subject is attainable only by constant effort on the part of both the teacher and pupil. Mr. McCarter read a paper on composition, in which he censured the method adopted by some of teaching composition as a distinct branch, and advised the method of teaching this subject in connection with each reading lesson. This paper was well read, interesting and profitable to all. In the evening the association was entertained by a very interesting and instructive lecture on "Electricity" by Mr. Fawcett, B. A., head master high school, Carleton Place. The lecturer explained by diagrams and apparatus the action of this subtle fluid, interspersing his discourse with many amusing experiments. The audience gave Mr. Fawcett its undivided and appreciating attention for more than an hour, and we feel assured that he cannot but be popular as an expounder of his favorite studies. The first business of the second day was the election of officers. The following officers were elected for the ensuing year:—Pres., F. L. Michell; vice-pres., John McCarter; sec.-treas., John Thornton; committee of management, Messrs. Anderson, McGregor, Steele, Fawcett, and Miss Todd; auditors, W. P. Robertson and R. J. Dougherty. Before proceeding with the regular routine business, Mr. Clarke, M. A., Smith's Falls high school, gave a short and excellent specimen of school calisthenics. Mr. Michell then took up practical arithmetic for the junior classes. He threw out many valuable suggestions in reference to the teaching of this important subject, and pointed out that consecutive thought and correct habits of reasoning can be acquired only by thorough and systematic teaching in the lower departments of our schools, otherwise failure is the inevitable result. He drew the diagram of a numeral frame greatly superior to the one at present in use. Mr. Clarke again gave a very interesting and concise lesson on the railway system of Canada, touching not only upon those now in operation, but also upon proposed routes and those in process of construction. By means of several maps and the blackboard he located our several railways so plainly that he who "runs may read." Mr. Clarke was followed by Mr. Menzies in a well worded paper, "Our Model schools." He admitted at once that no fault could be found with the model and normal schools as such, but in some respects the training of the students in our normal schools was far from satisfactory. Some of the grievances mentioned seemed so grave as to be almost incredible, had his statement not been confirmed by graduates of both our normal schools. The session was brought to a close by Mr. T. O. Steele, head master Perth model school, in a paper entitled "Spots on the Sun." The sun alluded to was our educational system and the spots, the inconsistencies and defects thereof. He criticised the separate school Act, and regarded the appointment of a separate school inspector as unjust and useless. He opposed the introduction of compulsory reading of the Bible in schools and also of any religion or moral training except by precept and example. He found fault with the present mode of conducting the model schools, and touched upon the system of "cram" necessarily imposed upon the pupils of the schools of our cities and towns.