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The Canada School Journal.

VOL. VII.

TORONTO, NOVEMBER, 1882.

No. 65.

The Canada School Journal

IS PUBLISHED THE FIRST OF EACH MONTH AT

11 WELLINGTON ST. WEST, TORONTO, ONT., CAN.

Subscription \$1.00 per year, payable in advance.

Address—W. J. GAGE & CO., Toronto.

CANADA SCHOOL JOURNAL HAS RECEIVED

An Honorable Mention at Paris Exhibition, 1878.

Recommended by the Minister of Education for Ontario.

Recommended by the Council of Public Instruction, Quebec.

Recommended by Chief Superintendent of Education, New Brunswick.

Recommended by Chief Superintendent of Education, Nova Scotia.

Recommended by Chief Superintendent of Education, British Columbia.

Recommended by Chief Superintendent of Education, Manitoba.

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

THE SCHOOL JOURNAL.

We call the attention of all who are interested in school work to the advertisement in this issue of the terms on which we are prepared to supply the SCHOOL JOURNAL for 1883.

We propose to make the SCHOOL JOURNAL during the coming year still more worthy of support. We are about to combine with it the SCHOOL EXAMINER and in this way make it more useful than ever to the teacher. In addition to our other departments, which will be kept up regularly, we have started this month an entirely new one, dealing with uniform district examinations. This has been placed under the charge of a thoroughly competent editor whose experience as a public school inspector fits him in a very special manner for the work.

Those teachers who find the SCHOOL JOURNAL helpful to themselves will do the publishers a favor by bringing it under the notice of others who do not take it. In this way they will benefit their fellow teachers and do much towards improving the condition of our schools by the diffusion of practical knowledge and the introduction of improved methods.

GAGE'S PRACTICAL SPELLER.

Correct typography is of the greatest importance in school books, and it is more necessary in the speller than in any other except the dictionary. It has been the earnest desire of the publishers of the "Practical Speller" to make it absolutely free from errors and in this they believe they have succeeded. The proof sheets have been subjected to the most thorough revision by different persons, one of them a skilled proof reader who has worked on both Worcester's and Webster's dictionaries. With a view to the detection of defects in the latest edition, if such there be, they offer a reward of one dollar for each

word found to be incorrectly spelt, the reward to go to the first person who calls attention to any particular error.

The best answer to the attempt of the literary "Smellfungus" of the *Educational Monthly* to prejudice the book is the fact that though it is only a year and a half since its first publication, the sixth edition is now on the press. The last edition was one of 5000 copies, and these have all been disposed of within three months. No book ever issued from the Canadian press has met with more signal approval from teachers than this. We refer to these matters, not for the purpose of advertising a book that needs no special notice, but to defeat the sinister purpose of a hireling scribbler, whose remarks of last month show that he is willing to wound but afraid to strike.

RECENT NORMAL AND MODEL SCHOOL CHANGES.

The changes which have recently been made in the function and organization of the Provincial Normal and Model Schools call for a brief notice. For years past the institutions at Toronto and Ottawa have been running independently of each other, each in its own groove. Working under the same general regulations, there was still room for considerable diversity of method, and, as a matter of fact, a good deal of diversity existed. Teachers trained at one institution might go into professional work with views on some important points quite different from those trained at the other. A little diversity of method is not in itself a bad thing; but, in the work of training teachers, all of whom have to work under the same system, it is just as well to have them trained under conditions as nearly as possible identical. Diversity will make itself sufficiently manifest afterwards.

With a view to securing the desired uniformity in the work of the Normal Schools, they have, as we have already mentioned, been both placed under the directorship of the senior High School Inspector, Dr. McLellan. As a further step in the same direction, the mathematical mastership has been restored to the Ottawa Normal School, and the post has been filled by the appointment of W. Scott, B.A., who has for many years held the position of Head Master of the Toronto Model School. Of Mr. Scott's fitness for his new sphere it is unnecessary to say much. He has made for himself a record as a teacher of which any of his *confreres* might be proud, and his name has become familiar to both teachers and pupils as one of the authors of Kirkland & Scott's "Elementary Arithmetic"—the best and most successful work of the kind now before the public. While engaged in the work of teaching, Mr. Scott passed the annual examinations in the University of Toronto, and graduated in that institution with more credit than attaches to the average student who enjoys the privilege of attending collegiate lectures. His past record

justifies us in predicting that his promotion to a higher and wider sphere of usefulness will have a marked effect on the professional character of those teachers who are fortunate enough to come within the sphere of his influence.

Mr. Scott's place as Head Master of the Toronto Model School has been taken by C. Clarkson, B.A., who is, like his predecessor, a graduate of the University of Toronto. His favorite subject is mathematics, and his fellow-teachers have frequently benefited by his knowledge and skill through the columns of the CANADA SCHOOL JOURNAL, to which he has been a frequent contributor. Mr. Clarkson was an experienced and successful public school teacher before taking a university course. Since graduation he has had charge of the Brockville County Model School and of the Seaforth High School, in both of which he added to his professional reputation as well as his experience. He enters his new sphere with the brightest prospects of success, and with the best wishes of his fellow-teachers, amongst whom he has always been exceptionally popular.

QUEEN'S COLLEGE.

Under the energetic superintendence of the Rev. Principal Grant there is little danger of Queen's standing still. Whenever he wants funds he makes a point of saying so, and he generally manages to say it in such a way that the money is forthcoming. He is equally prompt and impartial in securing good men to fill vacancies in his staff. A few months ago the chair of classics, rendered vacant by the lamented death of the late Professor Mackerras was filled by the appointment of John Fletcher, M.A., a Canadian with an Oxford training. Recently two more appointments have been made which can hardly fail to raise the reputation of Queen's. The venerable Dr. Williamson, who has long filled the chair of Physics, having retired from active service in connection with it, his place has been taken by D. H. Marshall, M.A., F.R.S.E. who comes with the very highest recommendation and with a good deal of professional experience. After serving for some time as assistant to Professor Tait in Edinburgh University he spent seven years in the Japanese Imperial College at Tokio. Professor Dupuis, who has had for some years both Mathematics and Chemistry under his charge, is relieved of the latter by the provisional appointment of George McGowan, F.R.S.E. This will enable the staff to do better for the students in both departments.

THE "MARMION" CONTROVERSY.

Now that the discussion about "Marmion" as a high school text has come to an end it may be not unprofitable to inquire what has been gained by it from an educational point of view. During the controversy much has been said that had better have been left unsaid, but on the whole much good has been done, and not a little useful light thrown on one important department of secondary education, the study of English.

The agitation about "Marmion" grew out of the objections urged against it by representative clergymen of the Roman

Catholic church, these objections being based on the fact that certain passages of the poem contain representations of Roman Catholicism insulting to the adherents of that persuasion. To insist that Roman Catholic candidates for the teachers' and the intermediate examinations should study critically a text so offensive to them was felt by the Education Department to be unjust, and for this reason the Minister of Education has allowed an option between "Marmion" and "Goldsmith's Traveller." Had he done so at the outset the prolonged controversy might have been avoided, but it was deemed advisable to allow the Senate of Toronto University to take action first as it was primarily responsible for the selection of the book. The Senate declined to make any allowance for scruples, however, and this left the Department free to act on its own responsibility with the result above stated.

The questions raised in the controversy were (1) whether the objections to "Marmion" urged by the Roman Catholic hierarchy were reasonable, and whether the Archbishop of Toronto had a right to a hearing as the representative of his church; (2) whether the remedy proposed by the Department of Education is the one most likely to suit the case; and (3) whether "Marmion"—and Burke's "Reflections" may be named with it in this connection—is, apart from questions of religion and morality, a suitable text-book for the intermediate and matriculation course. These we propose to consider briefly in the order in which they are stated.

1. Every reasonable man, especially if he knows anything about the constitution of the Roman Catholic church and the relation of the hierarchy to the laity within it must at once concede the propriety of any complaint about text-books coming through the highest dignitary of the church in the Province. Those who felt it a grievance to be compelled to read "Marmion" did the most natural thing when they consulted Archbishop Lynch about the matter, and it was equally natural and proper that he should state their objections to the Department. If he misstated the views of his people that is his own and their affair; if he stated their views correctly the outside public have no right to refuse to hear the complaint simply because he was the mouthpiece of his church.

Nor, we imagine, can there be much diversity of opinion as to whether the objection, when properly understood is a reasonable one. Much of what has been written on the subject has been aside from the real issue here. The objection urged has not been so much that "Marmion" is immoral—though we know of Protestant high school masters who think it quite unfit to be read in class even on this ground alone—as that it is offensive to a large and respectable religious body who have the same rights in the high schools as all other denominations have. There could not have been any intention to insult the Roman Catholics by making such a selection, but when the book is found to be objectionable it is reasonable and proper to endeavor to find a remedy.

2. Has the Minister of Education found the best remedy? He proposes to allow those who object to "Marmion" to read instead of it the "Traveller." This will enable those who have purchased editions of "Marmion", or may desire to use them, to go on and do so; it will at the same time enable

those who cannot use it to provide a substitute book at the least possible expense, for the "Traveller" was in use in 1880 and will come into use again next year by the ordinary rotation of texts. We have the best of reasons for stating that this arrangement will be satisfactory to those who raised the objections, and as the freedom of others is not interfered with they cannot have any ground of complaint. As the Departmental examinations are not competitive there can be no difficulty in the double examination in literature except the extra work of preparing a second paper.

3. The most important question of all is whether, apart from religious considerations, "Marmion" and the "Reflections" are good texts for high school or matriculation purposes. We are strongly of the opinion that they are not, and we are confirmed in this view by the opinions of many high school teachers and others whose judgment and experience make them safe guides in such matters. We believe that very little of Burke's literary work is suited for juvenile study and that it would have been difficult to select anything less appropriate than his strictures on the French Revolution. The whole tone of the pamphlet is bad politically, and it has the great defect of doing the author a serious injustice. It was the production, not of Burke the liberal and tolerant political philosopher in the full vigor of his intellect, but of Burke the morbid old man with mind all but unhinged and perceptions either obtuse or warped. And the style is as unsuitable as the matter and spirit. At his best Burke was apt to lapse into turgidity, and in the "Reflections" he is hardly ever anything but turgid. From this cause alone, to say nothing of the complete falsity of his point of view, it is one of the most wearisome of literary productions. If a piece from Burke must be had it would be much better to select passages from some of his noble speeches in favor of the right of the American colonists to political freedom, with the loss of which they were threatened during the earlier part of his public career.

"Marmion" also is open to the objection of being wearisome. It is too long for critical study, and it always spoils a poem to select a piece of it when it is in itself a complete work of art. One might as well attempt to estimate a painting by selecting a few square inches for study. "Marmion" contains some of Scott's best poetry and some of the most trashy he ever wrote. It is spun out to such a length and is so purely narrative that there is nothing in it to study. *Marmion* himself is a prosaic scoundrel who endeavors by forgery to ruin an honorable rival and lives a licentious life. There is not a fine character in the book, the best being *Clare's*, and she is all but a nonentity. Linguistically the poem is not valuable as a study. There are many archaic words but Scott's archaisms are all of one class and such words, when mastered, add no valuable element to a student's vocabulary. After a critical study the introductions to the cantos will be almost the only parts that furnish any lasting possession and this is saying little for the work. In the range of modern English literature something far more suitable than "Marmion" might surely be found for such a purpose. In several respects, to say nothing of what is likely to offend on religious grounds, even the "Lady of the Lake" is superior to it.

A USEFUL RECIPE.

Mr. Burke, a teacher in South Hastings, brought before the notice of his fellow teachers in that district at a recent convention the following recipe for making an excellent substitute for more costly copying presses. Take one pound of glycerine, four ounces of French glue, and one pint of water, melt them together in a pan over a fire, and when the mixture is thoroughly dissolved pour it into a shallow tin dish large enough in superficial area for the paper to be used in making copies. The tin dish should be carefully made with sides as straight and corners as square as possible. In writing the original to be copied use aniline ink and press the written sheet gently on the smooth surface of the gelatinous mass in the dish. When taken off it leaves a well-defined impression in ink, and by pressing blank sheets on the same surface scores of copies can be made from the one impression. This cheap press can be made very serviceable by the teacher in the production of papers for conducting written examinations.

NEW READERS,

We notice that at the conventions now held the question of new reading books is a prominent topic of discussion, the usual practice being to refer the different series to a committee for inspection. To this plan we have no objection, but it would be well for the teachers to bear in mind these two facts: (1) that while Gage's "Canadian Readers" are now complete up to the end of the fifth book there is no other series at all approaching that condition; and (2) that while the prices of the various members of the "Canadian" series are given no announcement has yet been made as to the price of either the "Royal Canadian" or the "Royal" series. The various numbers of the "Canadian" series are sold at the same price as corresponding numbers of the present series, and conventions, before expressing any opinion as to the merits of the different books, would do well to ascertain the prices of all. It is clear that cost must always form an important element in the reading book problem.

—We commence this month the publication in the *SCHOOL JOURNAL* of a little work entitled "The Problem of Teaching to Read." It is from the pen of one of the ablest educationists of the present day, J. M. D. Meiklejohn, M.A., Professor of the theory, history, and practice of education in the University of St. Andrews. The problem of teaching beginners to read is the most difficult the teacher has to encounter, and no one has done more to simplify that problem than Professor Meiklejohn has done in his little treatise. To his other qualifications he adds that of being a distinguished philologist, and, without any exhibition of pedantry, he throws, by means of his scientific knowledge, a good deal of light on the history and peculiarities of our perplexing English orthography.

MILLAR'S "MARMION."

As aid to venture on a criticism of Mr. Millar's high school edition of "Marmion" and the "Reflections," in the columns of their own journal, the clique who run it have taken refuge in the columns of one of the daily papers in this city. We do not propose to notice in detail criticisms so reckless that they could not have found a place in the columns even of the *Educational Monthly*, especially since the latter has made the discovery that it vegetates in a very frail glass house. Sneers about style will not for some time to come be very common in its columns; but anything is good enough, apparently, for a daily paper. That we have traced the critique to its true source is manifest from the fact that numbers of the issue containing it were sent to high school masters in different parts of the province. In view of this attempt to injure Mr. Millar, we have much pleasure in calling attention to the character of the notices contained in one of our advertising pages. We venture to say that no stronger or more commendatory remarks have ever been made by so many competent judges about any book ever published in this country. Mr. Millar has indeed good reason to feel gratified with the warm appreciation of his editorial labours by his fellow-teachers, and, for the information of others, we have only to add that he has further cause for gratification in the fact that his is the only edition of "Marmion" which finds its way, to any considerable extent, into the schools. This is the real source of the bitter animosity shown towards him by those who are interested in less salable editions.

—A correspondent of the London (Eng.) *School Guardian* recently gave amongst other reasons why the Kindergarten system should not be adopted in the Church of England schools, the following two which are worthy of special notice: (1) that Froebel's system is detrimental to the infant mind from the religious point of view, and (2) because it is not calculated to give the best intellectual training. Religious truth, he holds, is the most important of all, and as that can be communicated only by dogmatic teaching, it is a bad thing to train children to believe only what is demonstrated to them. "A questioning and reasoning spirit," he says, "is quite the last phase of mind I should wish to cultivate in infants." If this were the view taken by the church school teachers generally we should expect those schools to decline very rapidly in popularity and efficiency. He does not "approve of the idea that lessons should be so easy." It is only by being allowed to surmount difficulties that the child can be trained for the duties and trials of life which it will have to face sooner or later without assistance. There are ways and ways of teaching pupils to surmount difficulties, but it is safe to say that those practised by a good Kindergarten constitute not the least effective training for after life.

The first requisite is to teach the child to recognize words. Forming sentences goes hand in hand with the learning of new words; these sentences are written, and composition or pencil-talking is the result. Proceeding from objects to names teaches definitions; words are understood and become part of the child's vocabulary. The skilful teacher will give the child a broad basis of language.

Mathematical Department.

EXAMINATION FOR GRAMMAR SCHOOL PRINCIPALS.

CHICAGO, NOV. 19, 1881.

MATHEMATICS.

1. Define quadratic equation; a pure or incomplete quadratic; an affected quadratic. Define both kinds of progression, illustrating each.
2. A gentleman has two square rooms whose sides are to each other as 2 to 3. He finds that it will require 20 square yards more of carpeting to cover the floor of the larger than of the smaller room. Required the length of a side of each room.
3. Given $x^3 + 3x^2 = 10$. Find x .
4. \$110 was divided among a certain number of persons. If each person had received \$1 more he would have received as many dollars as there were persons. How many persons were there?
5. The sum of the first and third of four numbers in geometrical progression is 10, and the sum of the second and fourth 30. What are the numbers?
6. Describe the process of constructing a triangle whose given sides are m , n , and o .
7. How are the surface and volume of a cylinder, of a cone, and of a sphere found? Give the reasoning employed in the last case.
8. There is a cone 12 inches high, and 8 inches in diameter. An auger, $2\frac{1}{2}$ inches in diameter, entering at the centre of the cone's base, bores a hole perpendicular to the base to the depth of 5 inches. Required, the volume of the cone remaining.
9. Define a spherical triangle, a spherical wedge, great and small circles. What measures the shortest distance from one point to another on the surface of a sphere?
10. Describe and illustrate by diagram the trigonometrical process of finding the distance of an inaccessible object from a given point.

VICTORIA UNIVERSITY MATRICULATION, SEPTEMBER, 1881.

ALGEBRA—PASS.

Examiner—J. A. McLELLAN, LL.D.

1. Multiply $2x - 3y - 4(x - 2y) + 5[3x - 2(x - y)]$
by $2x - (y - x) - 3[2y - 3(x - y)]$.
Answer: $(3x + 15y)(14x + 2y) = 6(x + 5y)(7x + y) = \&c.$
2. Divide $a^2 + b^2 + c^2 - 3abc$ by $a + b + c$. From the result write down the quotient arising from the division of $a^2 - b^2 - c^2 - 3abc$ by $a - b - c$.
Answer: $a^2 + b^2 + c^2 - ab - bc - ca$.
Now, in this result we have simply to write $-b$ for b , and $-c$ for c , seeing that the second dividend is obtained from the first, and the second divisor from the first divisor by changing the letters thus.
Answer: $a^2 + b^2 + c^2 + ab - bc + ca$.
3. When is a quantity said to be symmetrical in respect to a and b ? With respect to a , b , c ?
Simplify $(x + y + z)^2 + (x + y - z)^2 + (y + z - x)^2 + (z + x - y)^2$.
See McLellan's Algebra, chap. II.
See May number, page 103, problems 8 and 9.
Answer: $2(x^2 + y^2 + z^2) + 6(x^2y + x^2z + y^2x + y^2z + z^2x + z^2y) - 12xyz$.
4. Show that $(x^2 + 6xy + 4y^2)^2 + (x^2 + 2xy + 4y^2)^2$ is exactly divisible by $(x + 2y)^2$.
We know that $a^2 + b^2$ is divisible by $a + b$, hence this given expression is divisible by $(x^2 + 6xy + 4y^2) + (x^2 + 2xy + 4y^2)$, i.e., by $2(x^2 + 4xy + 4y^2)$, or by $2(x + 2y)^2$.
5. Resolve into factors $4x^4 + y^4 - 8\frac{1}{2}x^2y^2$; $x^4 + 2x^2 + 6x - 9$;
 $px^2 - (p + q)x^2 + (p + q)x - q$; $a^5 - 16b^4$.
 $A = (2x^2 - y^2)^2 - 17\left(\frac{xy}{2}\right)^2$
 \therefore the factors are $2x^2 - y^2 \pm \frac{1}{2}xy\sqrt{17}$
 $B = (x^4 - 9) + 2x(x^2 + 3) = (x^2 + 3)(x^2 + 2x - 3)$

C Observe that p or q is involved only in a single dimension. Hence arrange with p or q as letter of reference. See McLellan's Algebra, "Factoring by Parts," p. 80.

$$\therefore p(x^2 - x^2 + x) - q(x^2 - x + 1)$$

$$= (x^2 - x + 1)(px - q)$$

D $= (a^4)^2 - (4b^2)^2 = (a^4 + 4b^2)(a^4 - 4b^2)$
 $= (a^4 + 4b^2)(a^2 + 2b)(a^2 - 2b)$. N.B.—It is possible to split the quantity $a^4 + 4b^2$ into factors by adding $4a^2b$ and subtracting $4a^2b$ but the coefficients are no longer rational quantities.

6. If $9x^4 - 30x^2y + Qx^2y^2 - 10xy^3 + y^4$ is a perfect square, find the value of Q .

Answer: $Q = 31$.

By inspection, thus: $9x^4$ is the square of $3x^2$; twice the product of this into the next term of the root must give $-30x^2y$, \therefore the second term of the root is $-5xy$. The y^4 is the square root of y^4 , and as the $10xy^3$ is $-$ while the $5xy$ is $-$ it is evident that the y^2 must be $+$. Thus the root must be $3x^2 - 5xy + y^2$, from which it follows by squaring that the coefficient of x^2y^2 must be $25 + 6$ or 31 .

7. If $u = \frac{1}{2}(x + \frac{1}{x})$, and $v = \frac{1}{2}(y + \frac{1}{y})$, find the value of

$$uv - \sqrt{1-u^2} \sqrt{1-v^2}$$

Since $u = \frac{x^2+1}{2x}$, $1+u = \frac{(x+1)^2}{2x}$, and $1-u = -\frac{(x-1)^2}{2x}$

$$\therefore 1-u^2 = \frac{(x^2-1)^2}{4x^2} (-1) \text{ and } \sqrt{1-u^2} = \frac{x^2-1}{2x} \sqrt{-1}$$

And by symmetry $\sqrt{1-v^2} = \frac{y^2-1}{2y} \sqrt{-1}$

$$\therefore \sqrt{1-u^2} \cdot \sqrt{1-v^2} = \frac{1}{4} \left(x - \frac{1}{x}\right) \left(y - \frac{1}{y}\right) (-1)$$

Hence given expression $= \frac{1}{4} \left(x + \frac{1}{x}\right) \left(y + \frac{1}{y}\right) + \frac{1}{4} \left(x - \frac{1}{x}\right) \left(y - \frac{1}{y}\right)$

Reducing down we get $\frac{1}{4}(xy + \frac{1}{xy})$ Answer.

8. Solve the equations:—

$$(1) \frac{x+a}{x-a} - \frac{x-a}{x+a} = \frac{x+b}{b-x} + \frac{x-b}{x+b}$$

$$(2) \sqrt{\frac{x-2}{x+2}} + \sqrt{\frac{x+2}{x-2}} = 4$$

$$(3) \frac{x+a-b}{x-a+b} = \frac{a(x+a+5b)}{b(x+5a+b)}$$

$$(4) (x+y)(x^2+y^2) = a; \quad x^2y + xy^2 = b$$

(1) Complete the divisions expressed by the fractions. The quotients cancel. Thus:—

$$2a \left\{ \frac{1}{x-a} + \frac{1}{x+a} \right\} = -2b \left\{ \frac{1}{x-b} + \frac{1}{x+b} \right\}$$

i.e., $a \cdot \frac{2x}{x^2-a^2} = -b \cdot \frac{2x}{x^2-b^2}$ $\therefore 2x=0$, and $x=0$, one root.

also $\frac{a}{x^2-a^2} = \frac{-b}{x^2-b^2}$, whence $x^2=ab$, $x = \sqrt{ab}$.

(2) Clear of fractions and we have

$$(x-2) + (x+2) = 4(x^2-4)^{\frac{1}{2}}$$

$$x = 2(x^2-4)^{\frac{1}{2}} \text{ Squaring}$$

$$3x^2 = 16, \therefore x = \pm \frac{4}{3}\sqrt{3}$$

(3) Adding and subtracting numerators and denominators

$$\frac{x}{a-b} = \frac{x(a+b) + 10ab + a^2 + b^2}{x(a-b) + (a^2 - b^2)}$$

$$\therefore x = \frac{x(a+b) + 10ab + a^2 + b^2}{x + (a+b)}$$

Clear of fractions and cancel, and we have $x = \sqrt{a^2 + 10ab + b^2}$.

(4) Take first equation and add twice second, and we get

$$(x+y)^2 = a + 2b, \text{ or } x+y = (a+2b)^{\frac{1}{2}}$$

$$\therefore \text{from first } x^2 + y^2 = a + (a+2b)$$

$$\text{and from second } 2xy = 2b + (a+2b)$$

$$\therefore (x-y)^2 = (a-2b) + (a+2b)$$

$$\text{i.e., } x-y = (a-2b)^{\frac{1}{2}} + (a+2b)^{\frac{1}{2}}$$

But $x+y = (a+2b)^{\frac{1}{2}}$. Whence by addition and subtraction

we have the values of x and y .

9. The product of the sum and difference of a number and its reciprocal is equal to $3\frac{1}{2}$, find the number.

Let x and $\frac{1}{x}$ be the number and its reciprocal,

$$\text{Then } \left(x + \frac{1}{x}\right) \left(x - \frac{1}{x}\right) = 3\frac{1}{2}$$

$$\text{i.e. } 4x^4 - 15x^2 - 4 = 0$$

$$\therefore x^2 = 4 \text{ or } -\frac{1}{4}$$

$$\text{and } x = \pm 2, \text{ or } \pm \frac{1}{2}\sqrt{-1}$$

10. Simplify $(x^{\frac{1}{2}-\frac{1}{3}})^{\frac{2}{3}} (x^{\frac{1}{3}-\frac{1}{2}})^{\frac{2}{3}} (x^{\frac{1}{3}-\frac{1}{6}})^{\frac{2}{3}}$; and extract the square root of $2x + \sqrt{3x^2 - y^2}$.

$$(a) \text{ Expression} = \left(x^{\frac{1}{2}-\frac{1}{3}} - \frac{1}{2} + \frac{1}{3} - \frac{1}{6} + \frac{1}{3} - \frac{1}{6} - \frac{1}{6} + \frac{1}{3} - \frac{1}{6}\right)^{\frac{2}{3}}$$

$$= (x^0)^{\frac{2}{3}} = (1)^{\frac{2}{3}} = 1$$

(b) Observe that $(2x)^2 - (3x^2 - y^2) = x^2 + y^2$, which is not a perfect square. Hence the result will be more complex than the given expression. If the coefficient of $3x^2$ were changed to four we should get y^2 instead of $x^2 + y^2$, and the criterion would hold. We might then put the square root of the expression $= \sqrt{m} + \sqrt{k}$, &c., &c. See Hamblin Smith's Algebra, Canadian Edition, p. 227.

11. Find a number expressed by two digits whose sum is 10; and such that if 1 be taken from its double the remainder will be expressed by the same digits in reversed order.

Let $x =$ units and $y =$ tens.

$$\therefore x+y=10 \text{ and } 10y+x = \text{the number.}$$

Also $2(10y+x) - 1 = 10x+y$. Two simple equations from which we get $x=7$, $y=3$ and number $=37$.

CAMBRIDGE ENG.—PREVIOUS EXAMINATIONS.

ALGEBRA. (Higher.)

1. Find a formula for the sum of the first n terms of an arithmetical progression of which the first term is a and the common difference b .

The first term of an arithmetical progression is 3 and the third term 9; find the sum of the first 20 terms.

2. Prove that the sum of a geometrical progression of which the first term is a , the common ratio r , and the last term l , is $(rl-a) + (r-1)$.

The sum of a geometrical progression, whose common ratio is 3, is 728, and the last term 486; find the first term.

3. The sum of three numbers in A. P. is 21 and their product is 315; find the numbers.

4. Sum to n terms and, when possible, to infinity the following progressions: (i) $9+5+1-3-\&c.$ (ii) $4-3+\frac{1}{2}-\frac{1}{4}+\&c.$

(iii) $\frac{1}{3} + \frac{1}{2} + \frac{1}{3} + \frac{1}{8} + \&c.$
 5. Prove that $(x-y)(1-az-aw+axw) + (y-w)(1-ax-az+axz) = (1-ax)(1-y-w+ayw) - (1-azw)(1-x-y+axy) = (x-w)(1-ay-az+ayz)$.

6. Prove that if $x=a+d$, $y=b+d$, $z=c+d$, then $x^2+y^2+z^2-yz - xz-xy = a^2+b^2+c^2-bc-ca-ab$.

7. Two passengers have together 500lbs. of luggage, and are charged 5s. and 5s. 10d. respectively for the excess above the weight allowed. If the luggage had all belonged to one of them he would have been charged 15s. 10d. How much luggage is a passenger allowed free of charge?

8. Define a logarithm; and find the logarithms of (i) $\sqrt{2}$, (ii) 4, (iii) 16, (iv) 64, to the base 16.

Given that, to base 10, $\log 2 = 0.301000$, and $\log 3 = 0.4771213$, find the logarithms of (i) 72, (ii) 14^4 , (iii) 0.0015 and (iv) $\{3^5\}^{\frac{1}{2} + \sqrt{5}}$.

9. Define the characteristic of a logarithm, and state the rules by means of which the characteristic of a logarithm to base 10 of any given number may be written down by inspection. Divide 5.3010300 by 9. What is the integral part of the logarithm of (i) 200, (ii) $\frac{1}{200}$ to the base 11?

Using the value of $\log 2$ given in the previous question, determine how many cyphers there are between the decimal point and the first significant figure in $(\frac{1}{2})^{1000}$.

RESULTS.

1. 630. 2. 2. 3. 5, 7, 9. 4. (i) $n(11-2n)$; (ii) $1^2\{1 - (-\frac{1}{2})^n\}$, 1^2 ; (iii) $\frac{1}{2}\{(\frac{1}{3})^n - 1\}$. 7. 120 lbs. 8 (i) $\frac{1}{2}$; (ii) $\frac{1}{2}$; (iii) 1; (iv) $\frac{1}{2}$.
- (i) 1.8573326; (ii) 1.1583626; (iii) 1.760913; (iv) 1.1998692. 9. 1.4778922. (i) 3; (ii) -2. 301.

ARITHMETIC. (Selected.)

1. A grain dealer bought 1300 bushels of wheat and sold $\frac{1}{2}$ of it at a profit of 5 per cent., $\frac{1}{4}$ at 8 per cent. profit and the rest at 12 per cent. profit. Had he sold all at a profit of 10 per cent., his gain would have been \$16.68 $\frac{1}{2}$ more. Find the cost price of the wheat.

And $(3 \times 1.05) + (5 \times 1.08) + (7 \times 1.12) = (15 \times 1.10) = 11$, i. e. for every \$15 of the cost the grain would have been \$11 more.

∴ original cost = $16.68\frac{1}{2} \div 15 \times 11 = \2275 .

2. The gross annual receipts of a railroad are divided as follows: 40% for working expenses, 54% to pay a dividend of $3\frac{1}{2}\%$ to stockholders, and \$28350 placed in the reserve fund. Find the amt. of the railroad stock.

6% = reserve = \$28350, ∴ 54% = dividends = $\$28350 \div 9 = 3\frac{1}{2}\%$ of stock, ∴ stock = \$729000.

3. A's present age is $\frac{7}{8}$ of B's, but 34 years ago it was $\frac{5}{8}$ of B's. Find their present ages.

The difference of the ages is constant. Now $9 = 4\frac{1}{2}$ times $(9 - 7)$, and $5 = 1\frac{1}{2}$ times $(5 - 2)$.

∴ A's former age = $1\frac{1}{2} \div 4\frac{1}{2} = \frac{1}{3}$ of his present age.

∴ $\frac{1}{3}$ of A's present age = 34, A's age = 51, B's 42.

4. A boatman rows 5 miles with the tide in the time he would row 3 miles against it. But if the current ran half a mile an hour more, he would row twice as rapidly with the tide as against it. Find this rate in miles per hour in still water.

If 5 and 3 be his rates with and against the current, then $\frac{1}{2}(5+3) = 4$ will be his rate in still water, and $(5-4)$ or $(4-3) = 1$ will be the rate of the current = $\frac{1}{4}$ rate in still water.

Similarly if 2 be his rate with and 1 his rate against it then $\frac{1}{2}(2+1) = 1\frac{1}{2}$ will be his rate in still water, and $(2-1\frac{1}{2})$ or $(1\frac{1}{2}-1) = \frac{1}{2}$ = rate of current = $\frac{1}{3}$ rate in still water, ∴ $(\frac{1}{2} - \frac{1}{3})$ rate in still water = $\frac{1}{6}$ mile per hour, i. e. rate in still water = 6 miles.

5. If 12 oxen eat up $3\frac{1}{2}$ acres of pasture in 4 weeks and 21 oxen eat up 10 acres of like pasture in 9 weeks; find how many oxen will eat up 24 acres in 18 weeks. Ans. 36. (Proposed by Sir Isaac Newton, 1704.)

NEWTON'S SOLUTION. If 12 oxen in 4 weeks eat up $3\frac{1}{2}$ acres, then by proportion 36 oxen in 5 weeks, or 16 oxen in 9 weeks, or 8 oxen in 18 weeks, will eat up 10 acres, on supposition that the grass did not grow. But since by reason of the growth of the grass 21 oxen in 9 weeks can eat up only 10 acres, that growth of the grass in 10 acres for the last 5 weeks will be as much as would be sufficient to feed the excess of 21 oxen above 16, that is 5 oxen for 9 weeks, or what is the same thing, to feed $\frac{5}{9}$ oxen for 18 weeks. And in 14 weeks, the excess of 18 above the first 4, the increase of the grass, by analogy, will be such, as to be sufficient to feed 7 oxen for 18 weeks, for it is 5 weeks : 14 weeks :: $\frac{5}{9}$ oxen : 7 oxen. Wherefore add these 7 oxen, which the growth of grass alone would suffice to feed, to the 8, which the grass without growth after 4 weeks would feed, and the sum will be 15 oxen. And, lastly, if 10 acres suffice to feed 5 oxen 18 weeks, then, in proportion, 24 acres would suffice 36 oxen for the same time.

SOLUTION by A. Martin, M.A., editor *Mathematical Magazine*, Erie, Pa.

In the first case one ox eats $\frac{3\frac{1}{2}}{12}$ or $\frac{5}{72}$ of an acre and $\frac{5}{18}$ of the growth of that acre in one week. In the second case one ox eats $\frac{10}{21}$ of $\frac{10}{21}$, or $\frac{10}{441}$ of an acre, and $\frac{10}{21}$ of what grows on one acre, in one week. Since one ox eats the same quantity of grass in one week in each case, therefore $\frac{10}{441} - \frac{5}{72} = \frac{5}{1512}$ of the growth of one acre during one week is $\frac{5}{1512} - \frac{10}{441} = \frac{5}{1512}$ of an acre; and $\frac{5}{1512} \div \frac{5}{72} = \frac{1}{21}$ of an acre, what grows on an acre during one week. $\frac{5}{21} + \frac{5}{72}$ of $\frac{1}{21}$ = $\frac{5}{72}$, the part of the original quantity on one acre which one ox eats in one week. $\frac{5}{72} \times 18 = \frac{5}{4}$ = quantity of grass, in acres, one ox will eat in 18 weeks. $24 \div (\frac{5}{4} \times 24 \times 18) = 60$ = quantity of grass, in acres, to be eaten from 24 acres in 18 weeks; and $60 \div \frac{5}{4} = 36$, the number of oxen required to eat it.

MANITOBA TEACHERS' EXAMINATION, 1882.

ARITHMETIC.

Examiner—J. B. SOMERSET, Esq.

Time—THREE HOURS—1st & 2ND CLASSES.

(The questions marked * are not to be answered by first class candidates. Second class may work any of the questions, 10 correct answers being considered a full paper for each class.)

1. *Simplify $\frac{1}{1 - \frac{1}{2 - \frac{1}{3}}} - \frac{1}{1} + (1 + \frac{1}{2})$

$$1 - \frac{1}{2 - \frac{1}{3}} = \frac{2 - \frac{1}{3}}{2 - \frac{1}{3}} = \frac{2 - \frac{1}{3}}{\frac{6 - 1}{3}} = \frac{2 - \frac{1}{3}}{\frac{5}{3}} = \frac{3(2 - \frac{1}{3})}{5} = \frac{6 - 1}{5} = \frac{5}{5} = 1$$

$$1 - 1 + (1 + \frac{1}{2}) = 1 + \frac{1}{2} = 1\frac{1}{2}$$

2. *A person has \$15,566.60 invested at 6%; he saves each year $\frac{1}{4}$ of his income and adds it to his capital. What will his income be the fourth year?

3. *A dealer invests \$2,000 in the purchase of 22 horses, pays \$280 for their carriage here, \$75 for stabling and $1\frac{1}{2}\%$ for insurance. He loses one horse, which the insurance company makes good with \$150. How much per head must he sell the rest for to realize 12 per cent. on his investment?

4. *At what rate per cent. will \$1,520.00 amount to \$1,733.75 in $2\frac{1}{2}$ years?

5. Three contractors agree to build a road for \$10,000. A has 25 men at work for 16 days and 30 men for 34 days. B has 40 men for 10 days and 45 men for 40 days. C has 48 men for 50 days. C receives \$200 for superintending the work. How much is each contractor entitled to?

6. A note of \$6,000, dated May 16, payable 4 months after date, is discounted on July 21st at 6 per cent. by giving another note at 90 days, the proceeds of which will just meet the amount due. What is the face of the second note, interest being at the same rate?

7. Sterling exchange being at $9\frac{1}{2}\%$ per cent. premium, find the cost of a draft on London for £416, 8s 9d, brokerage being $\frac{1}{2}\%$ per cent.

8. School debentures are issued maturing in 20 years and bearing 6 per cent. interest. At what rate shall I bid for them so that my investment shall bring me 9 per cent. per annum?

9. If the stock of an insurance company paying yearly dividends of 10 per cent. is purchased at $137\frac{1}{4}$, brokerage being $\frac{1}{4}\%$ per cent., what per cent. of income will it produce on investment?

10. A miner finds a gold nugget weighing 24 lbs. 12 oz. avoirdupois, which when assayed, proves to be 18 carats fine; standard gold being 22 carats fine and worth \$17.62 $\frac{1}{2}$ per oz. Troy. Find the value of the nugget.

11. A railway train runs over a road $118\frac{1}{2}$ miles long in $4\frac{1}{2}$ hours; it stops 10 minutes for refreshments at a certain station and $2\frac{1}{2}$ minutes at each of 12 other stations, and runs through a tunnel $2\frac{1}{4}$ miles long at 16 miles an hour. What is the average speed per hour exclusive of stoppages, outside of the tunnel?

12. A room is 25 feet long, 16 ft. 6 in. wide, 11 ft. high. There are 4 doors 8 ft. high, 3 ft. 4 in. wide; two windows 8 ft. 4 in. high, 4 ft. wide, and a fire place 4 ft. 2 in. square. How many pieces of paper 8 yards long, 1 yard wide would be required to paper its walls?

13. A and B are each possessed of \$4,000. A invests in U.S. 5 per cents at 104 and B in $3\frac{1}{2}\%$ Consols at 91. At the end of a year A sells out at 102 and B at 98. Give the year's income of each and also his capital after selling out.

14. If I buy a horse for \$80 and am allowed 9 mcs. credit, and I sell him forthwith for the same sum, giving 3 months credit, find my gain per cent. money being worth 8 per cent.

15. A property of \$2,000 consisting of three farms of unequal value, is to be divided equally among three sons. They agree each to take a farm and balance the difference in value by money payments to each other. If the farms be valued as 11, 8 and 6, find the payments that must be made.

SOLUTIONS.

1. Ans = $2\frac{1}{2}$.
2. Income = $15566.60 \times (\frac{6}{100})^4 \times \frac{1}{4} = \968.024956 .
3. P. = $\frac{1}{4} \times \frac{1}{100} (2000 + 280 + 75 + 30) - 150 \div \frac{1}{4} = \120.057 .
4. $6\frac{1}{2}\%$.
5. A = \$2311.61; B = \$3581.395; C = \$4106.97.
6. Face $\times \frac{90}{100} = 5000 \times \frac{90}{100}$; ∴ face = \$6029.71.
7. Cost = $\frac{100}{100} \times \frac{100}{100} \times 416.8s9d = \2029.195 .
8. Rate $\times (1.06)^{90} = 100(1.06)^{90}$. Rate = $100(\frac{106}{100})^{90}$.
9. $137\frac{1}{4}$ yields 10 ∴ yields an income of $7\frac{1}{4}$.
10. Value = $24\frac{1}{2} \times \frac{1}{100} \times 12 \times \frac{1}{2} \times 17\frac{1}{2} = \$5204.88 +$
11. Distance outside tunnel = $115\frac{1}{2}$ mls.
Time in tunnel = $10\frac{1}{4}$ min.
Actual running time outside tunnel = $216\frac{1}{4}$ min.
∴ rate per hour = $115\frac{1}{2} \div 216\frac{1}{4} \times 60 = 31\frac{1}{4} \times \frac{1}{4}$ miles.
12. Distance round room = 83ft.; total area of walls = $83 \times 11 = 913$ sq. ft.

Area of doors &c = $137\frac{1}{2}$ sq. ft.; \therefore area to be papered = $775\frac{3}{4}$ sq. ft.
 Area of 1 piece = 72 sq. ft.
 \therefore number of rolls = $775\frac{3}{4} \div 72 = 10\frac{2}{3}$
 13. A's income = $40 \times \frac{1}{10} \times 5 = \192.30
 A's proceeds = $4000 \times \frac{1}{10} = \3923.07
 B's income = $40 \times \frac{1}{10} = \161.61
 B's proceeds = $4000 \times \frac{1}{10} = \4307.69
 14. 9 mos. = $\frac{3}{4}$ yr., 3 mos. = $\frac{1}{4}$ yr.
 Int. for 9 mos. @ 8% = $\frac{8}{100} \times 50 \times \frac{3}{4}$ discount = $\frac{3}{4}$, and P. W. = $\frac{50}{4}$
 Int. for 3 " " = $\frac{8}{100} \times 50 \times \frac{1}{4}$ \therefore discount = $\frac{1}{4}$, and P. W. = $\frac{50}{4}$
 \therefore gain = $80 \left(\frac{50}{51} - \frac{50}{53} \right) = 4000 \left(\frac{1}{51} - \frac{1}{53} \right) = \frac{8000}{58 \times 51}$
 \therefore gain % = $\frac{8000 \times 100}{53 \times 51 \times 80} = \frac{1000}{2703} = .37$ nearly = almost $\frac{3}{8}$ %

15. If 75 shares represent the property, the farms will be represented by 33, 24, 18 shares respectively; each son should therefore get 25 shares. Hence A must pay B one and C seven shares i.e. $\frac{1}{5}$ and $\frac{7}{5}$ of \$2000 respectively, or \$266 $\frac{2}{3}$ to B and \$1866 $\frac{2}{3}$ to C.

ARITHMETIC.

Examiner—J. B. SOMERSET, Esq.

TIME—THREE HOURS—THIRD CLASS.

- Simplify $\frac{3}{5} \times \frac{5}{6} - \frac{2}{3}$ of $\frac{7\frac{1}{2} - 5\frac{1}{2}}{1.625} \times .064743589$.
- Bought 6 cwt. 3 qrs. 21 lbs. of sugar, at £2 16s. per cwt., for which I am to pay two-thirds cash and the balance in soap at 4 $\frac{1}{2}$ d. per lb. What do I pay in money and how many lbs of soap?
- At what time after half past 3 o'clock will the two hands meet for the first time?
- A person performs $\frac{2}{3}$ of a piece of work in 11 days, he then receives assistance from another person and they finish it in 4 days. In what time could each do it by himself?
- Simplify $\frac{.1234 \times .4321 - .01}{.00481 \ 346}$ and $\frac{.83 + .0416}{.00 \ 25}$
- If brass be composed of 63 parts of copper and 31 parts of zinc, what quantity of brass contains 4 lbs more of copper than of zinc?
- 2 acres of land are contained in a field whose width is 2 chains 80 links. What is the length of the field?
- A man left $\frac{2}{3}$ of his property to his eldest son, $\frac{1}{3}$ of the remainder to the younger son and the rest to his wife. Upon dividing it was found that the eldest son had \$750 more than the younger. Find the share of each.
- What sum must I lend for 10 months at 6 $\frac{1}{2}$ per cent. per annum, so that I may receive interest to the amount of \$237.50?
- If 500 men can excavate a basin 800 yards long, 500 yards wide and 40 yards deep in 4 months, how many men will be required to excavate a basin 1,000 yds. long, 400 yds. wide and 50 yds. deep in 5 months?

HINTS AND RESULTS.

- 953840059
- £12 " 19 " 10 $\frac{2}{5}$; 346 $\frac{2}{3}$ lbs.
- 21 $\frac{1}{4}$ min. after four.
- 17 $\frac{1}{2}$ dys., and 27 $\frac{1}{3}$ dys.
- 9; 350.
- 11 $\frac{1}{2}$ lbs.
- 7 chains 14 $\frac{1}{2}$ links.
- \$1200, \$450, \$270.
- \$4384.61 $\frac{1}{5}$.
- $800 \times 500 \times 10 = 1000 \times 400 \times 10$ \therefore same number, 500.

ALGEBRA.

Examiner—A. DAWSON, M.A.

TIME—THREE HOURS.—FIRST CLASS.

1. Investigate a rule for finding the G.C.M. of two algebraical expressions, explaining when and why a factor can be introduced or suppressed.

Find the G.C.M. of $\begin{cases} a^4 + a^2x^2 + x^4 \\ a^4 + a^2x - ax^3 - x^4 \end{cases}$

2. Find the sum of the product of the roots of the equation $x^2 + px + = 0$.

When will the roots be real and different, real and equal, or impossible?

Form the equation whose roots are

$$\frac{p - \sqrt{q}}{pq} \text{ and } \frac{p + \sqrt{q}}{pq}$$

3. A triangular piece of ground contains 210 square feet and two of the sides are 18 and 25 feet respectively. Find the remaining side.

4. If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$ prove $\frac{ace}{bdf} = \frac{a^3 + c^3}{b^3 + d^3}$

Find the square root of $33 + 12\sqrt{6}$

5. Define the Harmonical mean between two quantities. The sum of three numbers in Harmonical Progression is 33 and their continued product is 972. Find the numbers.

6. Prove that the Arithmetical, Geometrical and Harmonical means between a and b are in order of magnitude, the arithmetical mean being the greatest.

Show that $p - \frac{p^2}{2} + \frac{p^3}{2} - (p^2 - p + 1) + (p^2 - p + 2) + (p^2 - p + 3) + \dots$ to p terms.

7. If \$900 pay 10 men for 10 weeks' work, for how many weeks will \$540 pay 6 men?

8. If $\begin{cases} a_1x + b_1y + c_1z = 0 \\ a_2x + b_2y + c_2z = 0 \end{cases}$

Show that $\frac{x}{b_1c_2 - b_2c_1} = \frac{y}{c_1a_2 - c_2a_1} = \frac{z}{a_1b_2 - a_2b_1}$

Eliminate x and y from $\begin{cases} x + 2y - c = 0 \\ 2x - y + b = 0 \\ x + y - a = 0 \end{cases}$

9. The number of combinations of n things taken $n - r$ together is equal to the number of them taken r together.

Find the number of combinations that can be made out of the letters in the word *binomial* taken 3 together.

10. Extract the square root of $1 + x^2 + 2(1 - x^2)\sqrt{x} + 3x - x^2$.

Show that $\sqrt[3]{5} = 1 + \frac{1}{3} - \frac{1}{9} + \frac{32}{27} - \frac{256}{243} + \dots$

SOLUTIONS.

1. The ordinary process of finding the G.C.M. of two expressions consists in continuously taking the difference between multiples of the given quantities. It depends on the fact that every measure of x and y will measure $mx \pm ny$ where m and n are any multiples whatever. In practice however it saves labor to restrict m and n to whole numbers. For the nearest method of conducting the operation see McLellan's "TEACHERS' HANDBOOK OF ALGEBRA."

Ans. $a^2 + ax + x^2$.

2. Sum = $-p$, product = q .

Roots are real and different, real and equal, or impossible according as $p^2 >, =, \text{ or } < 4q$.

Ans. $p^2q^2x^2 - 2p^2qx + p^2 - q^2 = 0$.

3. $210^2 = s(s-a)(s-b)(s-c)$, where $s = a + b + c$, and a, b and c are the sides. Given $a = 18, b = 25$, whence by substitution we get c .

4. Book-work. Ans $\sqrt{3}(2\sqrt{2} \pm \sqrt{3})$.

5. Book-work. Let $a, \frac{2ab}{a+b}$ and b be the numbers,

$\therefore (a+b) + \frac{2ab}{a+b} = 33$ and $\frac{2a^2b^2}{a+b} = 972$

whence $a = 6, b = 18$, and $\frac{2ab}{a+b} = 9$.

6. Book-work.

An A. P. First term = $(p^2 - p + 1)$ com. difference = 1, number of terms = p \therefore sum = $[2(p^2 - p + 1) + (p - 1)(1)] \frac{p}{2}$

= $p^{p+1} - \frac{p^3}{2} + \frac{p}{2}$.

7. Ans. 15 weeks.

8. Multiply (1) by a_2 , (2) by a_1 , subtract, transpose, and divide and $\frac{y}{a_2c_1 - a_1c_2} = \frac{z}{a_1b_2 - a_2b_1} =$ (by symmetry) $\frac{x}{b_1c_2 - b_2c_1}$.

Add (2) and (3) and $x = \frac{1}{3}(a - b)$

Subtract (3) from (1) and $y = \frac{c - a}{3}$.

9. Whenever a set of r things is selected from n things, there is left a set of $n - r$ things.

\therefore We have 8 letters of which 2 are alike. The 6 different letters may be combined two and two in $\frac{6 \times 5}{2}$ different ways = 15 and be-

for each of these we may place an i , giving 15 combinations of three different letters. But each group of three letters may be written in three different ways total number = $3 \times 15 = 45$.

10. Writing fractional exponents we have

$1 + 2x^{\frac{1}{2}} + 3x - x^2 - 2x^{\frac{3}{2}} + x^3$, and by inspection we see the square root is $1 + x^{\frac{1}{2}} + x - x^{\frac{3}{2}}$.

$$\begin{aligned} \sqrt[3]{5} &= (1+4)^{\frac{1}{3}} = 1 + \frac{1}{1} \cdot 4 + \frac{1}{1 \cdot 2} \cdot 4^2 + \frac{1}{1 \cdot 2 \cdot 3} \cdot 4^3 + \&c. \\ &= 1 + \frac{4}{3} + \frac{16}{3} + \frac{64}{3} + \&c. \end{aligned}$$

EUCLID.

Examiner—T. C. L. ARMSTRONG, M.A., LL.B.

TIME—THREE HOURS. SECOND CLASS

1. Draw a straight line at right angles to a given straight line from a given point in that line.

From the extremity of a line draw a line at right angles to it.

2. The angles which one straight line makes with another upon one side of it are either two right angles, or are together equal to two right angles.

Define right angle, perpendicular, problem, theorem.

3. If any side of a triangle be produced, the exterior angle is equal to the two interior and opposite angles; and the three interior angles of every triangle are equal to two right angles.

What proposition follows as a corollary from this?

Show that the angle in an equilateral triangle is $\frac{1}{3}$ of a right angle, that in a pentagon is $\frac{2}{5}$ of a right angle; and that in a hexagon is $\frac{1}{2}$ of a right angle.

4. The complements of the parallelograms which are about the diameter of any parallelogram, are equal to one another.

If the given parallelogram be a square, show that the parallelograms about the diameter are also squares.

5. If a straight line be divided into any two parts the squares of the whole line and of one of the parts are equal to twice the rectangle contained by the whole and that part, together with the square of the other part.

EUCLID.

Examiner—A. DAWSON, ESQ., M.A.

TIME—THREE HOURS.—FIRST CLASS.

1. Any two sides of a triangle are greater than the third side.

The difference between any two sides of a triangle is less than the third side.

2. The opposite sides and angles of a parallelogram are equal to one another and the diagonal bisects it; that is divide it into two equal parts.

Define a rhombus, an oblong, a scalene triangle.

The diagonals of a parallelogram bisect each other.

What changes can be made in the shape and dimensions of a parallelogram without altering the area thereof?

3. To describe a parallelogram equal to a given triangle, and having an angle equal to a given angle.

4. If a straight line be divided into two equal parts, and also into two unequal parts, the rectangle contained by the unequal parts, together with the square on the line between the points of section is equal to the square on half the line.

Construct a rectangle equal to the difference between two given squares.

5. To divide a given straight line into two equal parts, so that the rectangle contained by the whole and one of the parts, may be equal to the square on the other part.

If one side of a triangle be bisected, the sum of the squares on the other two sides is double of the square on half the side bisected, and of the square of the line drawn from the point of bisection to the opposite angle of the triangle.

6. If any two points be taken in the circumference of a circle, the straight line which joins them shall fall within the circle.

How would you answer the assertion that this proposition is self-evident?

Through one of the points of intersection of two equal circles draw the longest double chord.

7. The angles in the same segment of a circle are equal to one another.

About the triangle A B C describe a circle, from the points B and C lot fall perpendiculars on the opposite sides of the triangle meet-

ing the circumference in E and F respectively, prove that the arc A E is equal to the arc A F.

8. To describe a circle about a given equilateral and equiangular hexagon.

Does Euclid's definition of proportional quantities include incommensurable quantities? Define and explain.

9. If a straight line be drawn parallel to the base of a triangle to cut the sides or the sides produced, it will cut them proportionally; and conversely.

Is this converse universally true?

10. Similar triangles are to one another in the duplicate ratio of their homologous sides.

Bisect a triangle by a line drawn parallel to one of its sides.

HINTS.

1. I. 20. If ABC be any triangle, we have $AB < BC$ and CA . Take AC from the unequals, and $AB' < CA < BC$.

2. I. 34. Book-work. So long as the base is unchanged, and the parallelogram remains between the same parallels, the area is constant.

3. I. 42. 4. II. 5. The difference between the square on half the line and the square on the line between the points of section is equal to the rectangle contained by the unequal parts. Hence the construction: place the less of the two given squares so that two of its sides may be in the same straight lines with the sides of the greater square, and its diagonal part of the greater diagonal, produce &c.

5. II. 11. See Pott's Euc. Exercises on Bk. II. prop. 3.

6. III. 2. See Pott's note on this proposition. Join the centres. Through the point of intersection draw a line parallel to this double radius.

7. III. 21. The arcs are equal if the angle $ABE = \text{angle } FCA$, and since the sides AB and AC are cut at right angles this follows from I. 15 and I. 32.

8. Converse of IV. 15. Yes. See Pott's note Bk. V. Def. 3.

9. VI. 2. The enunciation is not sufficiently limited. In order that the converse may be universally true the enunciation ought to specify that the segments terminated at the vertex are to be homologous terms in the ratios, otherwise the alternate segments might have the same ratio but the line would not be parallel to the base.

10. VI. 19. See Pott's Euc. Bk. VI. Ex. 42. Hints &c., where the solution is given.

STATICS.

Examiner—E. L. BYINGTON, M.A.

TIME—TWO HOURS FOR THE THREE SUBJECTS.—FIRST CLASS.

1. Define the terms *Statics*, *Volume*, *Density*, *Moment*.

2. What elements of a force are necessary to ascertain its effects?

3. Find the resultant of two forces of P. lbs. each, acting on a body so as to make an angle of 120° . What angle will the resultant make with each of the forces? Ans. 120°

4. A force of 8 lbs acts on a body. The resultant is 10 lbs. The angle made by the given force and the resultant is 30° . What is the other force and what angle does it make with the given force? Ans. 6 lbs.; 90°

HYDROSTATICS.

1. State the two laws upon which the mathematical theory of Hydrostatics depends.

2. Describe Nicholson's Hydrometer and method of use.

3. How is a Barometer made? Explain its principle.

4. Why is the human body not crushed by the pressure of the atmosphere?

PHYSICS.

1. Distinguish *Molecule* from *Atom*.

2. Name the states of aggregation of matter.

3. What is meant by Conservation of Energy?

4. What is a Spectrum? Why does a Prism divide a ray of light?

5. How may positive and negative Electricity be easily developed and distinguished?

6. What is meant by Electrical Induction?

THE BEAUTY OF REPETITION.—Imagine yourself sentenced to sit quietly for thirty minutes and read over and over the same four or five verses from the average third or fourth reader! If a scholar's thoughts do not "wander from the lesson" after a second or third reading, it is because he has no thoughts.—*Iowa Normal Monthly*.

Special Articles.

THE PROBLEM OF TEACHING TO READ.

BY J. M. D. MEIKLEJOHN, M.A.

The problem of teaching children to read has, in my belief, never yet been fully faced or thoroughly solved. There is no similar problem in Germany; a somewhat similar—but not nearly so difficult—problem exists in France. But it is only in England—of all the countries of Europe—that we meet with the problem in a form of extremest difficulty; and the want of a solution that shall bring confidence with it into all our Primary Schools makes itself still everywhere felt.

We seem to be all so thoroughly familiar with it, and we have all talked about it so much and discussed it so often that it almost seems a superfluity to raise or to examine the question over again. —The fact is, that familiarity is the greatest enemy of knowledge. We have lived all our lives in a town; and we fancy we know it, and its history, and the inhabitants and all about it. A stranger comes and asks us a simple and easy question; and we are unable to answer it. So, many people who have spent all their lives in London imagine they 'know' London. —A village stands at the foot of a range of mountains, and many generations have been born into the valley and have died out of it, but no man, woman, or child ever suspected what lay in the strata of the mountains they had been looking upon all their lives. At length comes some stranger who had studied geology and mineralogy, and he applies his knowledge to these old, old phenomena, and from the character of the rocks and the dips of the strata, he tells the people there is copper there, and where it will most probably be found. 'Copper!' says the oldest inhabitant. 'I have lived here man and boy for the last eighty years; and my father and his father before me; and I never saw or heard of such a thing. It is against all experience.' It is against his experience; but then his mind was only the mind of his own eyes—the mind of eyes with no thought or questioning power at the back of them; and he was so familiar with everything that he could imagine nothing new in the old set of sights that had met his eyes for so many years. Thus it is plain that it is not ignorance—but familiarity—that is the enemy of knowledge. Ignorance is a clean sheet of white paper, on which we can write anything, but familiarity is a palimpsest, on which many writings and drawings have been carelessly and thoughtlessly scored, so that upon the blurred and blackened manuscript there is sometimes room for no more.

I venture to think that there are still several new and true words to be said about teaching to read, and that the problem still awaits discussion from new points of view by fresh minds. The new interest that has arisen in education on the one hand, and the new discoveries that have been made in philology and in the English language on the other, authorise us in cherishing a hope that some good result may be obtained from a new and careful examination of our English mode of writing down sounds.

For indeed the problem has two sides—the philological side and the educational side. As a question in philology, we ask ourselves: What kind of alphabet have we? How do we use it? Has it grown up like Topsy, or has it been carefully adapted to the sounds we all use? For we must not forget that the language itself—the real English language is not a set of writings, but a *tongue* or a *speech*; that we speak thousands of words for every one we write, that writing or printing is only a more or less device convenient—but is no necessary part of any language.

On the educational side, the question arises. How shall we put

this set of black marks—this notation—into the minds of our children? What are the natural motives and desires that we can appeal to for help in this process? How shall we induce our young children to take kindly to the learning—so that it may be welcome and a pleasure, and not painful and a labour? What powers of feeling, imagination, or intellect—because there is intellect even in the dullest and youngest—ought the Teacher to appeal to in his self-imposed task of training the child to read?

It is the purpose of the present writer, in this short paper, to try to answer these questions; and he hopes that, in the course and as the result of the discussion, something may be discovered that may redound to the benefit of Elementary Instruction in this country.

The examination of our English notation, in the light of the new science of philology, was hardly possible before the present generation. Everybody knew that our mode of 'spelling,' as it is called, is 'irregular' and 'anomalous' and a great many other things; but then this was looked upon simply as the whim of our fine old mother tongue—and as one of those little insular peculiarities which baffled and confused the foreigner, and was only another mark of our superiority to people born on the wrong side of the English Channel.

But we had neither the knowledge, nor could we have the aloofness and detachment of mind, which would enable us to see our notation as it is—and to describe its divergencies from a perfect or regular notation. Now, however, that the History of our English tongue is becoming more and more studied, and the knowledge of it spread abroad more and more widely, we are able to compare our notation with the alphabets or notations of other languages; and—what is still more interesting—we are able to give a historical account of almost every malformation or irregularity in our mode of printing our spoken language.

The History of the English Language tells us, in fact, that we never had—that we never have been able to achieve anything like regularity or common business-like self-consistency in the way of writing it down. It began to come over to this island in the fifth century—a poor, rough guttural, speech, in the mouths of hardy young men, and it probably remained unwritten until the eighth century. It lived in this island in different forms or dialects in different parts of the island, and the English of the Isle of Wight no doubt differed from the English of the Mercians as much as that differed from the speech of the Anglian peasant of Norfolk. If one dialect showed any tendency to coalescing with the others, and thus giving a harmonious development to our English speech, that tendency and that development were rudely interfered with by the irruptions of the Danes, who brought with them only another dialect of the same Teutonic speech—a dialect which preferred hard gutturals, like *k*, to soft gutturals like *g*, or aspirates like *ch*. The effects of this disturbance might have been eliminated, and some attempts at a harmonious spelling made by the English scribes, had it not been for the sudden and forceful importation of an entirely different language—a language not belonging to the Teutonic stock at all, but to the stock called Pelasgic, the branches of which are to be looked for in the Southern Peninsulas of Europe. The incoming of the Norman-French, who took the land, seized every high place in the state, shut out Englishman from all but the lowest offices in the Church—who imported their own language, modes of warfare, law, and political constitution, again arrested the harmonious development of our mother-tongue. From 1066 to 1362—three centuries all but four years—the Norman-French tongue was employed in courts of law; and the English yeoman could not plead or bring an action in his own language; and even English boys—as John de Trevisa tells us—had to construe their Latin into the French idiom. The English language remained in a disintegrated form—spoken in a different fashion and with differing vowel-

sounds in the North, the South, the East and the West; and for about two centuries it was hardly written at all. Any literature that existed in French was chiefly an importation and an exotic; and, though many Norman-French words were contributed to our language, its influence upon the writing down of English was wholly bad and confusing. For three centuries the two languages faced each other; and, though English, under the influence of French, entirely changed the build of its sentence, no influence for the better from it affected our notation. In fact, French—and especially Norman-French—was as bad in that respect, as we shall presently see, as our own English marking.

The English language practically remained—both for the ear and upon paper—a conglomerate of different dialects, with little or no tendency towards convergence, with perhaps a greater centrifugal than centripetal habit. The vowel-sounds differed, and the modes of writing them were different; certain consonants were favourites in one place and rejected in another; and there was no uniform mode of spelling English down even as late as the end of the sixteenth century.

(To be continued.)

HOMERIC COSMOLOGY.

Some stir has been excited in literary and scientific circles in the United States by "The True Key to Ancient Cosmology," a pamphlet recently published by Dr. W. F. Warren, President of Boston University. The author's idea is that the world, in the conception of Homer and the ancients generally, is a sphere or spheroid situated within the starry sphere, "each having its axis perpendicular and its north pole at the top." The upper hemisphere was regarded as the abode of man, the lower that of departed souls and their rulers, while the ocean stream is a broad belt flowing round what we call the equator, and separating the two hemispheres. Correspondingly the upper half of the starry sphere is the abode of the gods, while the lower half is Tartarus. This idea, or theory, which completely reverses the traditional interpretation of the Homeric cosmogony, is illustrated by diagrams and engravings. If it is correct, a most striking proof is given of the possibility of many successive generations of archaeologists, scientists and scholars failing to catch the entire drift and spirit of ancient legends and literature in their cosmic teachings and relations. Dr. Warren's theory is exceedingly simple, so simple indeed that, if it is Homer's conception of the universe, the wonder becomes all the greater that the scholarship of two thousand years should have overlooked it. In stating his supposed discovery, the learned Doctor assumes the evidence to be demonstratively convincing, particularly the fact that the scheme explains so many otherwise inexplicable phrases in Homer. In addition, he undertakes to prove that this idea runs through the beliefs and records of all the ancient races. As we have spoken of this interpretation as a *discovery*, we ought to state that its author claims for it the direct or implied sanction of Mr. Gladstone, and certain noted German authorities. The chief points which have been taken in opposition by writers who have discussed Dr. Warren's pamphlet, are that the theory is inconsistent (1) with many Homeric phrases; (2) with references to the rivers as the children of Ocean, (3) with repeated hints as to the connection between the marine and infernal deities; (4) with the localizing sunrise at a point on the earth's surface; (5) with the terror of the infernal deities when the earth is shaken over their heads by the conflicts of the gods on the Plains of Troy, and (6) particularly with the vague and childish ideas of the Homeric age. To these objections Dr. Warren has made a brief reply through the columns of the *New York Independent*. So far from admitting their force

he claims that the references quoted are all best explained by his theory. His reply to objection (4) is worth quoting: "Proceeding on the false assumption that the Homeric earth was flat, some place the mythic isle in the furthest East, some in the furthest West, some in despair demand *two*—one in the East and one in the West. Conflicting and self-destructive as are these varieties of representation, they are all unwitting witnesses to the truth. The moment we wrap the three maps around the real Homeric sphere we see that, on the meridian opposite to the poet, East and West meet, and that precisely *there* all three of the cartographical depictions agree in locating the isle 'where are the abodes and dance grounds of Aurora, and where are the risings of the Sun.' Even before he abandoned the current view, and came to admit the sphericity of the Homeric earth, (as he now does,) Gladstone cannot as near the true interpretation as he possibly could and missed it, when, speaking of Helios he wrote: 'The fact of his sporting with the oxen night and morning goes far to show that Homer did not think of the earth as a plain, but round, perhaps, as a cylinder, and believed that *the East and West were in contact.*'"

As regards "the vague and childish ideas of the Homeric age," the author thinks that most poets' ideas—Wordsworth's for instance—would be considered "vague and childish," if interpreted literally. He resolutely declines to believe that "the world's greatest ethical poet was an idiot." People who hold, he argues, that Homer believed the sky to be a vault of metal, should also hold that he believed Achilles' voice to be a brass projectile.

We have referred to the subject as one attractive not only to classical scholars, but to the large class of our readers taking an interest in the genesis of scientific ideas.

THE REVELATIONS OF THE WEATHER-MAP.

A correspondent of the *New England Journal of Education* discourses thus enthusiastically about what is called the signal service system:—

Before the age of the weather-map it was as impossible to have much knowledge of the weather as before the age of discovery to have much knowledge of the geography of the globe; and at present it is useless to discuss the weather question with a person who is not familiar with the weather-map as to attempt to discuss the character of a country with one who has failed to study geography. The weather-map is the record of daily atmospheric changes, and is one of the most entertaining studies that science affords.

The first question that seems to present itself is, How to procure the map? For the information of those who would like to understand the wonderful revelations of this map, I would say that it is published daily by the Weather Bureau at Washington and sold at cost-price, two cents a copy, or two cents per day.—certainly not a very heavy tax for what it reveals.

Before we had these maps we had little idea of a storm; and even at present, no matter how intelligent a person may be, if he has not seen this map and closely followed its changes from day to day, he is entirely ignorant of our weather system; in fact he has not the remotest conception of it. For this reason it is most remarkable that our advanced scholars and leading men and women have so neglected this map and have committed themselves in favor of such nonsense as the so-called "weather prophets" have treated the world to for the past few years.

Let these intelligent people study this map for a few months, or better, for a season, and they will be surprised that they ever gave the least cognizance to such absurdities.

The weather-map reveals the daily changes of "high" and "low," i. e., high and low barometer; that what we term "low" moves, in general lines from the west toward the east; that the wind is always toward "low," therefore if "low" is on a high line it will be warm, if moving across the country on a low line, north winds, and therefore cold. "Low" is the agent of the storm,—the centre toward which the clouds are gathered, hence the movement of the clouds. The hurricane, the tornado, the wind-storm,—call it what we will—will always be found to be in the track of "low."

A "low" goes across the country about once in four days; and during the wet and dry months of July, August and September, it goes by as frequently as in March and April; but it crosses on such a high line that it goes by us time and time again without precipitation, at least more than an occasional thunder-storm. By the way, a *thunder-storm* is the result of a high "low," i. e., a "low" on a high line.

The tracks of these "lows" vary with the seasons. Whatever the change in temperature or moisture, the record thereof will always be found on the weather-map. It is most interesting to note the changes from day to day. The next "low" regulates the coming weather. Where will it appear?

We are always taken by surprise, and the revelation is, *nature never repeats herself*; her changes are endless, and her varieties most infinite, amusing, and instructive.

Intelligent men and women, especially teachers and instructors, procure the weather-map, study it carefully, note the changes day by day, and it will afford you entertainment and instruction. Nothing else will reveal the weather to you. If, as individuals, you are too poor to "carry" a long subscription for the map, form meteorological clubs, and divide the cost, consult together, notice the local weather in connection with the movements of "high" and "low" as revealed on the map. Do this for a year, and your praises will be unbounded in favor of the map,—you will write poetry and special discourses on this wonderful addition to modern science.

Your praises will know no bounds. You will perceive that not one-half, yea, not a quarter has been told you; and that you must see and study it for yourselves in order to fully appreciate its merits.

The estimation of weather probabilities has been regularly taken up in Canada in connection with the Magnetic Observatory in Toronto and also with the system in the United States. Meteorology has by means of the telegraph been made one of the most interesting departments of physical geography, and the managers of teachers' institutes would do well to give it occasionally a place on their programmes.

Examination Questions.

The following papers, set for what is called the "Queen's Scholarship" in England, are given as a specimen of the character of English public examinations. The answers to the mathematical papers are appended:

GRAMMAR.

Two hours and a-half allowed for this paper.

(No abbreviation of less than three letters to be used in parsing or analysis.)

All candidates must do the composition, parsing, and analysis, and must not answer more than five other questions.

COMPOSITION.

Write a letter on one of the following subjects:—

- (1) Gardening.
- (2) A storm at sea.
- (3) A day's angling.
- (4) Some public park.

GRAMMAR.

1. Parse fully the words italicized in the following sentences (Syntax is an essential part of parsing):—

"For who would bear

The insolence of office and the spurns
That patient merit of the unworthy takes,
But that the dread of something after death,
The undiscovered country from whose bourn
No traveller returns, puzzles the will
And makes us rather bear those ills we have
Than fly to others that we know not of?"

2. Analyse the sentence in Question 1, making a table, so as to show in separate columns.—

- (1) The nature of the sentence.
- (2) (If dependent) its relation to the principal sentence.
- (3) Subject.
- (4) Its enlargements (if any).

- (5) Predicate.
- (6) Its extensions (if any).
- (7) Object.
- (8) Its enlargements (if any).

3. Select and classify the pronouns, conjunctions, and prepositions in the same sentence.

4. Explain the terms cardinal, ordinal, and indefinite numerals, and give examples of each.

5. Give the past tenses of the verbs *crow, hew, sing, win, help, bul, chide, write, dig, lie, get, sheen*, and any obsolete forms of those tenses.

6. Classify the English conjunctions, and show that they are frequently derived from verbs.

7. Explain the force of the following affixes: *-dom*, as in *martyrdom*; *-some*, as in *handsome*; *-less*, as in *speechless*; *-ible*, as in *inflexible*, and give other examples of each affix.

8. Define a preposition, and show by examples that prepositions do not always precede the noun they govern.

9. Give examples of noun, adjective, and adverbial clauses, employed as subordinate sentences.

10. Name the sources of our language from which the following words are derived. *hat, shoe, vest, glove, sock, bonnet, ribbon, tunic, and shirt.*

GEOGRAPHY AND HISTORY.

Three hours allowed for this paper.

All Candidates must draw a map and answer Question 8. They may answer four other questions in each subject.

GEOGRAPHY.

1. Draw a map (showing physical features only) of—(a) Ireland, or (b) North America, or (c) Hindostan.

2. Explain the terms cardinal points, horizon, meridian, plateau; give the difference in time, and the distance, between two places situated on the equator in longitude 40° east, and longitude 40° west respectively, and state the latitudes of London, Edinburgh, Dublin and Liverpool.

3. Name four counties in England, Scotland, and Ireland respectively which are rich in minerals; and give a full account of one of the border counties of England or Scotland.

4. Describe a coasting voyage from Southampton by way of Lisbon to Constantinople, taking in cargo at six of the principal ports on the northern shore of the Mediterranean Sea.

5. Enumerate the chief productions of Trinidad, Victoria, and Ceylon, and give the dates at which these possessions were severally annexed to the Dominions of England.

6. Describe the positions of Cyprus, St. Helena, Borneo, Barbadoes, and Vancouver's Island; and give a full description of one of these islands.

7. Name the mountains in which the Rhine, Volga, Mississippi, Amazon, Indus, Lena, and Niger rise, the seas into which they flow, and a few of the principal cities on the banks of the four first-named rivers.

HISTORY.

8. Arrange in chronological order and give the dates of the following events:—The accession of George III., of Edward I., and of James I.; the battles of Culloden, La Hogue, and the Standard, the passing of the Act of Uniformity, the Septennial Act, and the Habeas Corpus Act; the deaths of Nelson, Wallace, Mary Queen of Scots, and Pitt.

9. Give a brief account of the conquest of Britain by the Romans, and name any distinguished Romans who died in this country.

10. Enumerate, with dates, the chief events of the reign of Henry III., and give a brief sketch of that monarch's character as illustrated by the events of his reign.

11. Write a short life of one of the kings who reigned in Scotland during the 16th century, and explain the claim of the House of Stuart to the throne of Scotland.

12. Name the principal English Statesmen in the reigns of Henry VIII. and Elizabeth, and write a brief life of one of them.

13. Enumerate the chief events of the years 1688-89, and state briefly the principal constitutional changes which resulted in England.

14. Give some account of the causes of the War of American Independence, and mention in order the chief incidents of that war.

15. Name sovereigns of France and Spain who were contemporary with Elizabeth, Charles II., and George III., and give a brief account of the foreign policy of Charles II.

DOMESTIC ECONOMY.

Three hours allowed for this paper.

Candidates are not permitted to answer more than one Question in each Section.

SECTION I. (*Needlework.*)—1. Describe fully the following stitches, and say in what garments and materials they are commonly used, and how you would teach them to children.—*hemming, felling, back-stitching, feather-stitching (i.e., coral stitching.)*

2. Describe the process of cutting out and making a pinafore for a girl six years old, with exact measurements, and an account of the materials required.

SECTION II. (*Savings and Investments.*)—1. State the annual income on which, in your opinion, a retired Schoolmistress could live in comfort in her old age; and the methods of saving and investment in her days of full work and salary, by which she could provide that income on retirement.

On what weekly wages can an artisan maintain in comfort himself, his wife, and four children between the ages of four and ten; and in what proportion should he distribute those wages in rent, food, clothing, education of his children, recreation, and savings?

SECTION III. (*Food—its ingredients.*)—1. What effect is produced on the human body by food containing in large quantities the following substances respectively: (a) sugar, (b) lime, (c) salt, (d) animal oils?

2. State fully what are the objections to a diet either exclusively vegetable or exclusively animal.

SECTION IV. (*Food—its preparation.*)—1. Describe the efficient modes of cooking potatoes; give your own opinion as to the merits of each, and say for what dish of meat each mode of cooking them is most suitable.

2. Give an account of the materials, preparation, and cooking of an economical and wholesome dinner for a Schoolmistress living alone.

SECTION V. (*Rules for Health.*)—1. Mention any respects in which the modern fashion of female dress is injurious to health, and show in what way each foolish practice in dressing produces its bad effects.

2. Give plain rules for the preservation of health for a Pupil Teacher (a) who lives in the country a mile from her school, and (b) for a Pupil Teacher in London living a few doors from her school.

3. What would you do before the doctor came, if a child in your school (a) was badly scalded, (b) had fainted, (c) had cut his arm above the elbow?

SECTION VI. (*Clothing and Washing.*)—1. Describe the modes of washing, drying, and getting up the different articles which would go into the tub on washing-day in a labourer's cottage.

2. Give an account of the price, material, colour, and making up of a neat dress for your own summer wear in school, and say how it should be washed and worn so as to last as long as possible.

MALE CANDIDATES.

ARITHMETIC.

Three hours allowed for this paper.

Candidates may answer all the questions.

The solution must be given at such length as to be intelligible to the examiner, otherwise the answer will be considered of no value.

1. Add together the products of each pair of the numbers 150, 225, 375, and find the difference between this sum and the product of all three numbers.

2. Divide 16 acres 3 roods 2 poles among four brothers, giving the eldest brother half as much again as each of the others, and find the value of the eldest brother's share at a guinea for each pole.

3. Find, by practice, the value of 17 lbs. 11 ozs. 16 dwts. 9 gra. of gold at £3 12s. 8d. per oz.

4. Find the difference between $\frac{1}{2} - \frac{1}{3}$ of 19s. 10d., and $\frac{3\frac{1}{2} + 2\frac{1}{2}}{3\frac{1}{2} - 2\frac{1}{2}}$ of 13d., and reduce the difference to the fraction of 4s. 5 $\frac{1}{2}$ d.

5. Express as decimal of a pound $\frac{2}{3}$ of $\frac{1}{5}$ of 3s. 9d., and find the value of that decimal of a yard.

6. Write out clearly and concisely the rules for—

- finding the G. C. M. of two numbers;
- finding mentally the product of 1616 by 625;
- subtraction of vulgar fractions.

7. If the larger wheel of a bicycle whose circumference is 8 yards, 0 feet, 5 $\frac{1}{2}$ inches, make 200 more revolutions than that of another bicycle in travelling 5 miles, find the circumference of the latter wheel.

8. 320 men begin a piece of work; it is completed in 6 days of 10 hours each, but on each day only half of those employed on the previous day are at work; in what time would 105 men working 6 hours a day have completed it?

9. Find the present value of £1363 due five years hence at 3 $\frac{1}{2}$ per cent. per annum simple interest.

10. A sum of £8505 invested in the Three per Cents. produces an income of £252; what is the price of the stock?

11. Extract the square root of 892143 of 12 $\frac{1}{4}$ square feet.

12. 800 yards of cloth are bought at 10s. 6d. per yard; half is sold at 10s. per yard, a fifth for 11s.; at what price must the remainder be sold to obtain a gain of 5 $\frac{1}{2}$ per cent. on the whole?

EUCLID ALGEBRA, AND MENSURATION.

Three hours allowed for this paper.

Candidates who attempt either of the questions in Mensuration must omit questions 11 and 12. (Marks are given for portions of questions.)

EUCLID.

In the Euclid questions all generally understood abbreviations for words may be used, but no symbols of operations (such as $-$, $+$, \times) are admissible. N.B.—Capital letters, not numbers, must be used in the diagrams.

1. If two triangles have two sides of the one equal to two sides of the other, each to each, and have likewise their bases equal; the angle which is contained by the two sides of the one shall be equal to the angle contained by the two sides, equal to them, of the other.

On the base of an isosceles triangle an equilateral triangle is described: show that the line joining the vertices of the two triangles bisects their common base at right angles.

What is the axiom on which Euclid bases his reasonings on parallel lines? Is Proposition 17 of the First Book the converse of that axiom? If so, is there any objection to the axiom?

If a straight line falls on two parallel straight lines, it makes the alternate angles equal to one another, and the exterior angle equal to the interior and opposite angle on the same side; and also the two interior angles on the same side together equal to two right angles.

3. In any right-angled triangle, the square which is described on the side subtending the right angle is equal to the squares described on the sides which contain the right angle.

From the middle point of a side of a right-angled triangle a perpendicular is drawn to the hypotenuse; show that the difference of the squares on the segments into which it is divided is equal to the square on the other side.

4. By what proposition of the First Book is it proved that the area of a triangle whose altitude is a units long, and whose base is b units long, is $\frac{1}{2} a b$?

If a straight line be divided into two equal parts, and also into two unequal parts, the rectangle contained by the unequal parts, together with the square on the line between the points of section, is equal to the square on half the line.

5. Why cannot we satisfactorily demonstrate propositions of the Second Book by algebraical processes?

In every triangle, the square on the side subtending an acute angle is less than the squares on the sides containing that angle by twice the rectangle contained by either of these sides, and the straight line intercepted between the perpendicular let fall on it from the opposite angle and the acute angle.

ALGEBRA.

6. Express algebraically:—the fourth power of the sum of two numbers (a and b), together with twice the product of their squares is equal to the sum of their fourth powers together with four times the product of their product and the square of their sum. Also verify it when $a=2$, $b=3$.

7. Subtract:— $(x+y)(3a-2b)$ from $(x+y)(3a+2b)$; and divide $x^2+y^2+1-2y+2x-2xy$ by $x+y+1$.

8. Prove the rule for dividing one algebraical fraction by another, the letters denoting any numbers.

Simplify $x+2+\frac{4}{x-2}+\left(\frac{x^3}{x^2-4}-x\right)$

9. Solve the equations :

1. $-17\left(x-\frac{4-x}{3}\right)=12\left(5x-\frac{7+3x}{8}\right)$.

2. $\begin{cases} 32x+81y=45. \\ 28x-39y=369. \end{cases}$

3. $\frac{3x}{x+2}-\frac{x-1}{6}=x-9$.

10. Prove that the difference between the cube of the sum of any two numbers and the sum of their cubes is divisible by three times their product.

EUCLID.

11. To draw a straight line from a given point without the circumference, which shall touch a given circle.

Show that two such lines can be drawn, and that they are equally inclined to the line which joins the given point with the centre of the given circle.

12. If a straight line touch a circle and from the point of contact a straight line be drawn cutting the circle, the angles which this line makes with the line touching the circle shall be equal to the angles which are in the alternate segments of the circle.

Write out the converse of this proposition.

MENSURATION.

13. The area of a chess board which contains 64 equal squares and an outer rim an inch wide, is 134.56 square inches: find the side of each square. Find also the width of the outer rim of another board of the same size, in which the area of each square is 1.361 square inches.

14. The three sides of a triangle are in the ratio 4 : 5 : 7, and their sum equals 32 yards, find the area of the triangle in yards, to two places of decimals.

FEMALE CANDIDATES.

ARITHMETIC.

Three hours allowed for this paper.

Candidates are not permitted to answer more than one Question in each Section.

The solution must in every instance be given at such length as to be intelligible to the Examiner, otherwise the answer will be considered of no value.

SECTION I.—1. The first of 4 parcels of money contained two hundred and six pounds, and twopence; the second fifty sovereigns, seventeen half-sovereigns, and nine half-pence; the third twenty-seven half-guineas, and eightpence; the fourth nineteen half-sovereigns, and three half-crowns. Distribute the amount equally among 29 societies.

2. One room contains 18 sq. yds., 3 sq. ft., 19 in.; a second, 42 sq. yds., 8 ft., 11 in.; a third, 29 sq. yds., 5 ft. 100 in. What must be added or subtracted in each case to make the rooms of average size?

SECTION II.—A silversmith made a certain number of teaspoons weighing 26 lbs. 10 oz. 13 dwt., and a certain number of tablespoons weighing 38 lbs. 10 oz. 11 dwts. 18 grs.; find the cost of all the spoons at £3 17s. 11d. per oz.

State the different methods employed in subtraction, and give your reasons for preferring one of them to another.

2. A farmer rents a farm of 400 acres on the following terms:—He pays as rent 100 qrs. of wheat, 75 qrs. of barley, and 60 qrs. of oats, the price of wheat, barley, and oats being respectively 49s. 6d., 30s. 8d., and 19s. 2d. per quarter. Give his average rent per acre in $\text{£} s. d.$

SECTION III.—1. Make the following bill:—5 tons of coal at 15s. 6d. per ton, carriage of same at 2s. 6d. per ton; 2 trucks of gravel (i.e. 11½ tons) at 5s. per ton, carriage of same at 2s. 6d. per ton.

What are the two different kinds of practice called? Which kind is mostly used in bills of parcels? Give reasons for your answer.

9. Find the change out of a £10 note after paying the following bill:—12½ yds. of flannel at 1s. 6d. per yd., 37 yds. of calico at 1s. 0½d. per yd., 21 yds. of muslin at 2s. 4½d. per yd., 18 yds. of linen at 2s. 6d. per yd.

What is a *Bill of Parcels*? What else is it sometimes called? What rules of mental arithmetic can be applied in finding the amounts of the items?

SECTION IV.—1. Find by practice the rent of 311 acres 2 roods 26 perches at 5s. 8½d. per rood.

What rule does practice depend upon? And how is that rule simplified by it?

2. A bankrupt can pay only 12s. 6d. in the pound, and his debts amount to £1,537 4s. 4d.; what is his estate worth? How much will be paid on a debt of £276 11s. 6d.?

What is meant by an "aliquot" part?

SECTION V.—1. The planting of a rood of ground cost £28 8s. 4d.; what was paid for planting 23 acres 3 roods 24 perches and 11 sq. yds.?

Explain and define *measure, factor, multiple, submultiple.*

2. Bought 176 yds. 2 qrs. 2 nails, 1½ inch, at 18s. 9d. per English ell (= 5 quarters); what is the gain or loss in selling at 6d. per inch?

3. Explain the terms *profit and loss—profit and loss per cent.*

SECTION VI.—1. If the road in front of a row of houses, three-quarters of a mile long, be repaired at a cost of £7 9s. 6d., what portion of the expense should be paid by an inhabitant, whose premises have a frontage of 18 yds. 2 ft.?

Explain the difference between "ratio" and "proportion." How many kinds of proportion are there? State and explain the names given to several parts in a proportion sum.

2. An engine of 16-horse power can pump out ⅔ of the water in a reservoir in 3 days, working 7 hours a day. In how many days will an engine of 15-horse power, working 8 hours a day, empty the reservoir?

By what methods can the work be shortened in a proportion sum? Explain why these methods are correct.

SECTION VII.—1. Two-sevenths of a farm is sown with wheat, four-ninths of it is pasture, and the remainder, woodland, contains 24 acres, 2 roods, 7 perches. Find the size of the farm.

What is a fraction? Name the different kinds of vulgar fractions, and distinguish between them.

2. If the owner of ⅙ of a ship sold (⅓ of ⅔)ths of his share for £4990, what was the value of (⅓ of ⅔)ths of the whole ship at the same rate.

Give and explain the names of the different parts of a vulgar fraction, and show their relation to each other, and to the integer.

SECTION VIII.—1. How much will remain of ⅔ of £25 2, after the following articles have been paid for, viz.: 1½ yds. of cloth at £0 8 per yard, and 12 2 yds. of linen at £0 125 per yard? Give the answer in decimal form.

Name the different kinds of decimals, and distinguish between them.

2. Find the value of ⅔ of ⅓ of £1 18s. + ⅔ of 0.0375 of 15s. + ⅔ of 0.429 of 8s. 3d., and express the result as the decimal of £5.

How may a vulgar fraction be converted into a decimal? What kind of vulgar fraction can produce no finite decimal? Explain why.

SECTION IX.—1. In what time will £436 10s. amount to £568 18 1s. at 7 per cent. per annum, simple interest?

Define "principal," "amount," "interest," (simple and compound), "discounts," "stocks," "annuities."

2. A farmer mixes wheat; 9½ qrs. at 38s. 6d., the same quantity at 40s. 6d., and at 42s. 9d. per quarter, and 24½ qrs. at 45s. and the same quantity at 47s. per quarter. What is the average price of the mixture?

What is a *percentage?* an *average?*

DICTIONATION AND PENMANSHIP.

Twenty minutes allowed for these exercises.

Candidates are not to *paint* their letters in the *Copy-setting Exercises*, but to take care that the copy is clean and without erasures.

Omissions and erasures in the *Dictation Exercise* will be counted as mistakes.

The words must not be divided between two lines, there is plenty of room for the passage to be written.

Write in large hand, as a specimen of Penmanship, the words *Major Fitzgerald.*

Write in small hand, as a specimen of Penmanship, the sentence—

There is a willow grows aslant a brook,

That hovers his hoar leaves in the glassy stream.

DICTATION.

(For the Examiners.)

The passages A, B are to be given alternately if the number of Candidates is large and there is danger of copying. If one is enough, give the first (A).

The passage should be read *once* distinctly, and then dictated *once* in portions as marked.

If the room is large, and there is danger of your not being heard at its extremity, you may permit one of the officers of the college to stand half-way down the room, and repeat the words after you exactly as you give them out.

It is essential that there be no complaint on the part of the Candidates that they could not hear or understand; you can only prevent this by clearness, accuracy, and audibility.

A.

They paddled onward hour after hour, | sheltering themselves as best they could | under the shadow of the southern bank; | while on their right hand | the full sun-glare lay | upon the enormous wall of figs, and laurels, | which formed the northern forest, | broken by the slender shafts of bamboo tufts, | and decked with a thousand gaudy parasites; | bank upon bank of gorgeous bloom | piled upward to the sky, | till where its outline cut the blue | flowers and leaves, | too lofty to be distinguished by the eye, | formed a broken rainbow of all hues | quivering in the ascending streams of azure mist, | until they seemed to melt | and mingle with the very heavens.

B.

As the sun rose higher and higher, | a great stillness fell upon the forest. | The jaguars and the monkeys | had hidden themselves | in the darkest depths of the wood, | the very butterflies ceased their flitting | over the tree tops, | and slept with outspread wings | upon the glossy leaves, | undistinguishable from the flowers around them. | Now and then a parrot swung | and screamed at them from an overhanging bough; | or a thirsty monkey | slid lazily to the surface of the stream, | dipped up the water in his tiny hand, | and started chattering back, | as his eyes met those of some foul alligator | peering upward | through the clear depths below.

ANSWERS TO THE MATHEMATICAL QUESTIONS

Males.

ARITHMETIC.

1. - 12,481,875.
2. - Eldest brother's share, 5a. 2r. 14p., each younger brother's share, 3a. 2r. 36p.
3. - £784 2s. 9½d.
4. - 5½d.; ¼.
5. - 369140625; 1 ft. 1.2890625 in.
6. - See Moffatt's Scholarship Answers, 1882.
7. - 10 yards.
8. - 10 days.
9. - £1160.
10. 101½.
11. - 3 ⅞ ft.
12. - 12s. 11 ⅞d. per yard.

ALGEBRA.

6. - $(a+b)^2 + 2a^2b^2 = a^4 + b^4 + 4ab(a+b)^2$
7. - $4b(x+y)$; $x-y+1$.
8. - $\frac{x}{x+2}$.
9. - (1) 1½. (2) $x=9$, $y=-3$. (3) 10, or -14.
10. - $(a+b)^2 - (a^2 - b^2) = 2ab(a+b)$.

MENSURATION.

13. - 1.2 in.; 1 ⅞ in.
14. - 39.19 + sq. yds.

Females.

ARITHMETIC.

SECT.

- I. - (1) £9 19s. 0½d. (2) 11 sq. yds. 8 sq. ft. 72½ sq. in. to be added; 12 sq. yds. 5 sq. ft. 63¾ sq. in. to be subtracted; 5 sq. ft. 135½ sq. in. to be added.

- II. - (1) £3074 14s. 9½d. (2) £1 1s.
- III. - (1) £8 16s. 3d. (2) £2 7s. 4¾d.
- IV. - (1) £344 10s. 3¾d. (2) £172 17s. 2¼d.
- V. - (1) £2716 17s. 10d. (2) Gann, £26 10s.
- VI. - (1) 2s. 1 ⅞d. (2) 7 days.
- VII. - (1) 90 a. 3 r. 33 p. (2) £1000.
- VIII. - (1) £16.635. (2) 4s. 9½d.; 047916 of £5.
- IX. - (1) 4½ years. (2) 4s. per quarter.

Practical Department.

SCHOOL GOVERNMENT.*

After urging the necessity of beginning in the right way the moral discipline of children, and explaining the origin of moral government in the family circle, the writer says:

"Next to the government of the home comes that of the school, and this we are now called upon more particularly to consider. First, then, we may contemplate the motives which should actuate the minds of children in rendering obedience. These motives may be many and varied, and in different schools or under different teachers different ones will prevail. For instance, in one school we will find that the degree of respect in which the teacher is held is the governing principle. In another he is beloved for his amiable qualities, and hence the desire to please him. In another the teacher in constructing his code of laws, has succeeded in making it both strict and popular. Again, in others some important interest of the pupil is made to do duty as a governing principle. In most of our best schools, however, different motives combine for the attainment of the desired end. In any case, whatever course be adopted, in order to the securing of proper order and cheerful obedience, should be such as will promote the growth of a spirit of kindness among pupils, and of every trait of character which adorns and ennobles the mind.

We are now to consider the best methods of detecting wrongdoing among pupils. In this, as in everything pertaining to his Profession, the teacher should adopt such measures as will convince the pupils that guilt cannot escape detection, then most of his difficulties in this direction are overcome. A few general principles may be laid down for the guidance of beginners, but success or failure will depend very much on the ingenuity of each teacher in the arrangement and perfecting of details.

Discourage and root out talebearing, if it exists in your school. Punish pupils sharply for bringing you information unsolicited. Encourage truthfulness in your pupils when placed under examination for the purpose of detecting wrongdoing. Many people consider a boy a hero who will prefer to undergo the most rigorous punishment rather than "peach" upon a comrade under examination. The same people should be consistent and heap honors upon the man who will lay perjury upon his soul in open court, or who will commit even a worse act in order to defeat the ends of justice. I have no sympathy with such notions of honor. If it is right and proper for men before properly constituted authority to bear witness against men for the maintenance of order in society, then it is right and proper for children to do the same thing under similar circumstances.

Few honorable men or women will stoop to play the spy upon their pupils. Do not permit your pupils to play the spy upon the actions of each other. This will exist in some schools to a greater or less extent. It is the offspring of jealousy, envy, or some malicious feeling. Stamp it out, for both it and its progenitors are

*Abridged from a paper read by Mr. S. Armour, before the East Victoria Teachers Association.

alike dangerous to the harmony and unity of your school. Enlist the sympathy and co-operation of your pupils in the maintenance of order. It will be easy to convince one that if his next neighbor, unknown to you, transgressed certain rules which he has religiously kept, the former has attained an undue advantage over him through fraud. Point out the dishonorable nature of such conduct. Ask pupils frequently if they have kept or broken this, that, or the other rule or instruction. Begin with those most likely to have obeyed them. The consciousness that they may at any moment be questioned relative to their own conduct or that of their classmates will render pupils more cautious, and with judicious management this caution may be increased until transgression of rules, or disobedience in most particulars is of rare occurrence. Certain allowances, however, should be made. Children are naturally thoughtless, and where disobedience to commands has occurred in this way, the pupil should be encouraged to come to you privately and mention it. A word of caution from you then will, in most cases, produce the best results.

Having perfected a system of detecting misdeeds, the question of punishment becomes one of secondary importance. Of course, I here assume the existence of rewards, in some form, for the faithful discharge of duty. But a teacher who has a large majority of his pupils well affected to the regulations which he has established, entertaining a proper respect for his person and opinions, and ready if need be to see justice done to any offender, even to their nearest friends, has need but seldom to resort to serious punishment; but cases do arise when such is needed, and these we may proceed briefly to consider. By associating pleasure or pain with actions of children we may, even before the development of the reasoning faculties, give their minds a set in the right direction, for it is natural for children to practise such habits as are followed by rewards or pleasures, while at the same time they will shun the practice of such as are followed by pain.

In the infliction of punishment in any form we should avoid all appearance of fretfulness, peevishness, or anger; the sufferer will then attribute his pain to his offence, while he will regard his ruler as just and generous. Since implicit obedience is the principal object to be attained in school government, it may be well to consider how to obtain it. I would begin by instructing children to perform duties that would cause pleasure; in short, tell them to do duties that they would do of themselves if they but thought of it. As obedience becomes habitual they may be ordered to do duties less attractive, and so on to those that may even excite dislike. Endeavor as much as possible with small children to turn work into play. On the contrary, you may often cure a pupil of over attachment to play by turning it into work. For instance, a boy too fond of playing marbles might be cured by ordering him not to desist until he had won two or three hundred marbles. Punishments have been classified by some into major and minor, the former generally meaning all forms of corporal punishment. I am not sure that corporal punishment presents most terrors to children's minds, especially to those of refined natures. Since punishment is inflicted in order to bring about moral reform, I should say that, to be most successful, we must look outside of the range of corporal punishments. Solitary confinement I believe to be one of the best methods, if properly exercised. Under its influence, the offender has time for dispassionate reflection, and, if it be accompanied with wise and kindly admonition, it will seldom fail to produce good results. This form, however, is not so well adapted to school life as it is to domestic rule, as the pupil is not permanently under the control of the teacher.

Reproof is good; but reprove only, do not reproach. Avoid ridicule; it has a similar influence on the minds of pupils. Hold up the fault to sneers and ridicule if you will, but spare the offender any degree of exposure. Do not, as a rule, administer reproof in public; nearly all will listen with some feeling more like contrition in private.

A LANGUAGE LESSON FOR THE SECOND READER CLASS.

I. THE SUBJECT MATTER OF THE LESSON. — "The swing. — Frank has made a swing for Lucy and little Tom. It is in the old apple-tree that stands by the gate. Amy has come to visit Lucy and Tom, and they are giving her a fine swing. See how Tom can run under! Lucy has her hat on, but the wind has blown Amy's hat off. You can see it lying on the ground. It is May. The grass is fresh and green. On the apple-tree, little pink buds peep out from under the leaves. Soon those buds will open into pink blossoms, and fill the air with a sweet scent."

11. STUDY OF THE LESSON. — 1. The pupils read the lesson until fluency is acquired.

2. The teacher induces the pupil to discriminate the parts of each sentence. The pupil answers in complete sentences, emphasizing the word containing the answer. Who has made a swing? Frank has made a swing. How did Frank obtain a swing? Frank has made a swing. What has Frank made? Frank has made a swing.

3. The teacher induces the pupil to discriminate the sentences of the lesson. What is said of Frank? Frank has made a swing for Lucy and little Tom. Where is the swing? It is in the old apple-tree that stands by the gate. What is said of Amy, etc.

4. The teacher induces the pupil to discover the relations which exist among the parts of the lesson.

Sentence first expresses how the swing was obtained.

The second sentence expresses where it is.

The third and fourth expresses its use.

The fifth and sixth describes a little accident while the swing is used.

The seventh expresses the time of its use.

The eighth, and ninth and tenth describe the grass and the pink buds of the apple-tree at that time.

5. The teacher discusses with his pupils the persons and things mentioned in the lesson.

The persons: Frank, Amy, Lucy, Tom.

The things: The swing, the hats, the grass, the apple-tree.

III. COMPOSITION. — 1. The teacher requires the pupil to write the lesson with changed person and number. I have made a swing for Lucy and Tom. It is in the old apple-tree that stands by the gate, etc.

Capitals and punctuation marks as in the book.

2. The teacher requires the pupil to write the lesson as if Frank and Tom made the swing. (Change of number.)

3. Change of the subject-matter. Frank has bought a little waggon for Lucy and little Tom. He bought it from a man who has a store on the corner. Amy has come to visit Lucy and Tom, and they are giving her a fine ride. See how Tom can push, etc. It is June, etc.

4. Describe a swing. (For older pupils.) This last request is too difficult for the Second Reader class, as the uses of punctuation marks have not been taught yet.

IV. GRAMMAR. — The word Frank is used as the name of a boy. The word Lucy is used as the name of a girl. The word gate is used as the name of a thing. Persons and things are called objects. Words used as the names of objects are called nouns. Nouns are words used as names. They may be the names of persons, as Lucy, Tom; or the names of things, as gate, apple-tree. Find nouns in your compositions. Why are they called nouns?

V. SPELLING. — The teacher requires the pupil to write from memory part of the lesson, with diacritical marks, division of syllables.

Note for the teacher.—This lesson is designed to show how reading, spelling, composition, grammar, and study lessons can be concentrated into one subject, one study preparing the others. The language lessons of the Third Reader class should be, on the whole, the same. But word-analysis should be added. In the class of the Fourth Reader the study of synonyms, the forms of composition, and the properties of style should be added; in the Fifth Reader class, biographical notes of the authors should prepare for the study of English Literature. Geographical, scientific, and literary notes should accompany the lesson whenever necessary to a complete understanding of the lesson.—C. FALK, in *N. C. Journal of Education*.

ENGLISH SPELLING.

Sooner or later the movement in favor of reforming our English Spelling is sure to find a certain amount of support amongst the teachers, and as one sign of the approach of the coming agitation it is interesting to note that some educational journals in the United States are giving up to it a portion of their space. At the recent Social Science Congress held at Saratoga, the Rev. H. L. Wayland of Philadelphia indulged in some very strong language on the subject. Amongst other things he said:

"If it were proposed to introduce such a system, we should cry out in amazed, indignant horror; nothing makes it tolerable for an instant, save the fact that we were born into it, and that we had become wonted to all these atrocities before we had sufficient power of reason to understand how monstrous they are. Consider the harm to the child's mind, to his reasoning powers. We say to him: 'Here is this letter; it has this sound, this force.' But he then finds it is purely a matter of chance whether it has this sound, or something entirely different. * * * It is because the child's moral nature has great staying powers that it is not wholly perverted. We say: 'Final e, when silent, makes the vowel of the syllable long.' So the child says, 'b-a-d-e. bade,' and we say, 'no; that is bad.' The child says 'definite,' and we say, 'Oh no; that is definit.' Silent e is a lie. Truth may lie at the bottom of a well; but it certainly does not lie in the primer."

The word *i-g-h-t*, Mr. Wayland says, "is a fraud; out of the five letters composing it only one has the sound that properly belongs to it." The *American Journal of Education* quotes, in a recent issue, the following passage from "The Caxtons," by the late Lord Lytton:

"A more lying, round-about, ruzzle-headed delusion than that by which we confound the clear intellect of truth in our spelling, was never concocted by the father of falsehood. How can a system of education flourish that begins by so monstrous a falsehood, which the sense of hearing suffices to contradict?"

A comparison of such opinions with those expressed by Professor Meiklejohn, in his "Problem of Teaching to Read," and with the views of Professor Max Muller and other eminent philologists will serve to show that the defects of our English alphabet and the anomalies of our English spelling continue their existence in the face of a strong and growing desire to remove them. The question how far teachers should fall in with any movement in this direction is an important one. No such movement can ever become a complete success without their aid, and sooner or later they will find themselves compelled to take up some attitude in the discussion. Those of conservative tendencies of mind will be the last to recognize the expediency of doing anything to simplify our spelling, while the more enthusiastic members of the profession will render the so-called spelling reformers cordial assistance. In view of the coming agitation it is worth while to at least inquire what the reformers propose to accomplish.

They may be arranged in three classes. The first comprises those who seek to correct such anomalies as may be corrected without any change of alphabet. They admit that such a measure of reform would not be thorough, but they contend that it has the merit of being feasible. Words similarly pronounced should, in their view, be similarly spelled, so far as our present defective alphabet will

admit of it. Some would carry this reform much further than others are willing to do, but in principle and method they are at one. To this class belonged Dr. Webster who, however, was ahead of his time as an orthographical purist.

The second class of spelling reformers embraces those who wish to retain our present alphabet and add to it new characters enough to make it perfect. It is evident that these have undertaken a much heavier contract than their fellow-reformers of the first class. The introduction of new letters to the number of from fifteen to twenty causes the commonest words to take on a foreign look, which must prove an obstacle in the way of the advocates of this method.

The third class includes those who seek to dispense altogether with the present defective alphabet, and substitute a new one which would combine the quality of simplicity of form with that of constancy in the use of the letters. They argue that if we are to go at all beyond the scheme of reform possible within the limits of our present alphabet, it is unwise to stop short of such a complete measure as would be impossible without a totally new set of marks to represent spoken sounds. They allege that the confusion caused by these new marks would be no greater than that caused by necessary additions to our present alphabet, and they contend that the new marks might be made very much more simple in form than those which have come down to us from sources some of which are now of great antiquity. Such a new alphabet is employed by all shorthand writers, whether they write from sound, as in Phonography, or use arbitrary symbols, as in the system called "takygraphy."

This whole subject is commended to the earnest attention of teachers. Whether they approve of any attempt at reforming English Spelling or not they will derive great benefit, even in teaching the written language as it is, from a thorough course in the phonetics of English and the history of the alphabet.

CHATS WITH BEGINNERS.

Assuming, my young friends, that, with a true appreciation of the responsibility of your chosen profession, you have given yourself professional training therefor, let us chat together of some little matters that do not hold a definite place in the curriculum of the best normal school.

You have completed the prescribed course of study for teaching, and armed with note-books and methods, accept your first school with a strong determination to win a name and position among good teachers. You believe that the teacher wields a powerful influence over her pupils, and with glistening eyes and throbbing hearts have listened to glowing descriptions of what the true teacher may accomplish for a human soul. In the solitude of the great congregation, in the depths of your own heart, you have registered the vow, "I, too, will be such a teacher!" The dreaded examination is waived in deference to your blue-ribboned diploma, or, with courageous heart and sound knowledge, you have met and answered the questions of the town committee. Perhaps you have left home for the first time, and already realize what otherwise you will soon learn, that you are no longer "child" but "woman" forevermore. You will leave your new boarding-place for your school room, morning after morning, for weeks to come. Pause a moment before you place the pretty hat upon your head.

"The teacher should be herself what she wishes her pupils to become." Is the hair so neat, so glossy and shining that, though God has not given you beauty of face, yet you are a "vision fair to see?" Are the teeth so clean and shining, that, by-and-by when you explain to your pupils the pleasure of looking at the mouth of

one whose teeth are nicely cared for they will see that what you say is true. Finger nails have a way of showing the character of their possessor: what is the legend inscribed on yours?

As the weeks go by, you fall into the routine of school-duties. You find a great deal of work to be done at home, out of school-hours, and, with a strong sense that you must do that faithfully and conscientiously, you correct the examination papers and spelling blanks, and go to bed tired and stupid, forgetting that as you closed the school-room door you tore the braid from your dress, and put a pin in it until you should reach home. Don't forget it tomorrow morning! Do not fail to give yourself the elevating, the sanctifying influence of clean collars, cuffs, and handkerchiefs. Try it some day when everything has seemed to go wrong; when your head aches, and slates are needlessly noisy; when your best boy seems to have no liking for study, and your brightest girl seems hopelessly stupid. When you go home to dinner, pin in clean collar and cuffs, and put on a fresh tie. If you have time redress your hair. You will go back to school refreshed, and the flash of your clean white linen will be a satisfaction to which no woman of refinement can be wholly insensible.

You think the children are behaving better this afternoon. Perhaps they are, but it is more likely that your own nerves are somewhat soothed; your voice is pleasanter, and the children are not often unresponsive to cheery tones. They certainly are more attentive to you, and perhaps the whisper will go around, "How pretty the teacher looks this afternoon!" though you may have the dress on you have worn for months.

And here let me suggest the wisdom of having two dresses for school-wear, instead of one, as is often the case with teachers of limited means. Despire nothing, however small, that lifts you out of the ruts of monotony. Wear your three or four ties alternately, a day or two at a time, instead of wearing them out in order. Tie them differently.

Relieve the plain blue by a simple daisy, or the white by a sweet-brier rose. Wear a bunch of daisies at your belt, and see if your worst boy will not soon bring you something else to wear. Be sure to wear his flowers though they be peonies or sunflowers.

In short, study to make yourself just as pretty as possible to the eyes of your children. This is a lesson learned from personal experience. Like many another young girl, I thought my tastes favored quiet, sober colors for myself, though I revelled in bright hues for girls who, —well who were not school teachers. One day, in what seemed a fit of barbarism, I twisted together pale blue and pink ribbons and, half-ashamed, went back to school with knots at the throat and belt.

Before the bell rang, Willie Riley, a little, lame Irish boy from a wretched home, entered the school-room; with a hasty glance at his teacher, he hobbled back to the door as fast as his poor little crutches could carry him, and without waiting to close it exclaimed, "Oh, ! teacher's got on a new bow, and she looks awful handsome!" Whereupon the teacher did a little moralizing and deduced the rule given above, which she has never yet seen reason to modify. Let the dress be simple, but bright and varied.

Many stories might be related illustrating the pleasure of the children in a teacher's brightness; as of the little boy, who said to his teacher, "Teacher, I love you dearly in the blue bow, and I love you dearly in the red bow, and I can't tell you which I love you in best!"

A town in Western Massachusetts saw one of its schools steadily retrograding, under a succession of incompetent teachers, and the bad influence of several large, unruly boys. The following conversation took place at the opening of a term between one of these boys and a resident of the town:

"Going to school this term, George?"

"Yes."

"Well, I hope you will behave yourself. You have made trouble enough."

"Wal, if the teacher fixes up, and curls her hair, I will; an' if she don't I won't"

The new teacher, a little girl of sixteen did "fix up," and she won for her school a good name. — *Ida M. Gardner, in the Central School Journal.*

Promotion Examinations.

The Editor of this department of the SCHOOL JOURNAL will be pleased to answer any questions arising out of the practical working of promotion examinations.

The good effect on the Public Schools of the regular examinations for entrance to the High Schools, led many inspectors and teachers to think a uniform system for promotion among the classes lower than the fourth, would be of much benefit in stimulating pupils, and in checking the improper influences often employed to secure transfers from one class to another. Various schemes for preparing questions, conducting the examination, reading the answer papers, and reporting the results, have been devised in many of the inspectorates. The main object in all of these is to provide such a test as will meet the approval of the average teacher. To him who neglects his school, or cares little for his profession, examinations are wholly useless; consequently, he cannot be satisfied with any method not begun and ended by himself. We are glad to know that in many counties a sound, practical system of promotion is adopted, that the teachers take a lively interest in the examination and have no desire to return to the former practice. Still there are other counties wrestling with the question. For their assistance we submit the following hints:

Bring up the subject for discussion at the Teachers' Association. If there is no one teaching in the division who understands the mode of procedure, have a teacher or inspector from some other county who can fully give the details. Objections may be raised and answered, but, after a careful investigation, it will likely be found a majority of the teachers are willing to try before they condemn. If, however, a vote cannot be carried in favor of promotion, there remains no alternative but to wait in the hope that opinion will change. Few teachers object to receiving questions for promotion, but they wish to read the answers themselves. Even this, though not enough, should be accepted, as it makes an excellent starting point, and may develop into what is not objectionable.

Assuming that the Association is in favor of a uniform method, the next step will be to make provision for preparing and mailing questions, reading answers and reporting the results. No one should be better qualified to set questions than the inspector, or some teacher thoroughly acquainted with the standing of the schools for which they are prepared. The questions should be printed and a copy sent for each candidate intending to write. Teachers can easily give notice to the proper person of the number of candidates in each class. The package of examination papers should not be opened till a few minutes before the hour for commencing to write.

To conduct the examination, which need not continue more than two days, let each teacher change schools with some other teacher named by himself, the executive committee of the Association, or the inspector. Doing this need not cause any inconvenience; in fact, it may prove an interesting relaxation from the round of every day duties. Besides, it removes the possibility of being charged with partiality, and provides a competent presiding examiner with very little trouble and expense. It would be well, when practicable, for one of the trustees to preside with the strange teacher.

The teacher of the school should leave on his desk the package of questions unopened, a list of the candidates, sufficient paper, envelopes, &c., for the examination, so that the presiding examiner would have nothing to do but see that the answering was done fairly and properly in every respect. At the close of the examination the answers to each subject should be placed in a large envelope, the ends cut off, and the envelopes bound in one package and forwarded to the person appointed to receive them for distribution among those appointed to read answers.

The examiners should meet immediately after the reception of the answer papers, carefully discuss each question, attach values to the answers, and decide the percentage required to pass. To ensure uniformity and dispatch, each examiner should use only one subject. One takes 2nd arithmetic, another 2nd writing, a third 2nd literature, &c. The examiners should report results to the inspector on or before a specified term. He will enter them in a book or books for the purpose—one book for each municipality is a good method. After the entries are made, each school should be reported to the teacher thereof, in order that he may mark the necessary promotions. All the packages should be returned to the inspector by the examiner. In case of dissatisfaction with the marking, the inspector and teacher can look over the answers and correct either errors or omissions. Each subject being in a separate envelope, the township and section on the outside, a few minutes will find the package and read the answers. Otherwise, the Association might appoint a board of appeal to consider any causes of complaint.

One other feature remains to be noticed. How are the necessary funds to be provided? The cost of printing for two examinations yearly need not exceed \$25. Mailing packages, one cent each, say \$2, having answers, if volunteers cannot be found, \$100, total \$127, or thereabouts. This sum, not very large, may be contributed by the teachers; or better, get the county or township councils to make a grant. Most county councils are willing, on hearing the merits of the scheme well discussed, to set aside a sufficient sum to pay all reasonable expenses.

QUESTIONS FOR PROMOTION.

LITERATURE.

CLASS II. TO CLASS III.

1. Write five words that should begin with capital letters; also five others requiring a hyphen.
2. Tell, in your own words, the story of "The Dog and the Shadow." What do we learn from this story?
3. What word or words mean the same as the following: Conspicuous, unnoticed, diverting, amiable, treacherous, brazier, determined, dignity, carcass?
4. From what lesson is this verse taken?
 Angry words! oh let them never
 From the tongue unbridled slip;
 May the heart's best impulse ever
 Check them, e'er they soil the lip.
 Why is it wrong to use angry words? What is the meaning of "unbridled," "heart's best impulse," "check," and "soil"?
5. Spell the following words, using an apostrophe in each: passed, over, I will, do not, they are.
6. Carefully write one verse from each of these lessons: "Meddlesome Matty," "The Beggar-Man," "Who taught them," "Evening Hymn."
7. Give the names of these marks: , ; : . ! ? " " Answer by making the mark and writing the name opposite.

III. TO IV.

1. What advice was given by the lawyer to Peter Bernard? Show that this advice may be useful to us.

2. Tell the story of Grace Darling. What three proofs were given that her conduct attracted attention?
3. Write notes on the habits and uses of the following animals: Whale, moose-deer, buffalo, cat, wolf, tiger, and elephant.
4. From each of the following selections write one verse: "Casabianca," "Look Aloft," "Speak Gently," "The Mouse's Petition," "Lucy Gray."
5. Give the meanings of italicized words:
 1. The *mandibles* of the spider were *buried* in its throat.
 2. Beavers are found in an *inhospitable climate*.
 3. They live by *violence* and *rapine*.
 4. His *rough voice* was reverberating in its *recesses*.
 5. I am *unconscious of peril*.
 6. By sharp instinct the *fraud* was *detected*.
6. By examples, two for each, show that you know where to use the period, point of interrogation, quotation marks, and note of exclamation.

GRAMMAR.

III. TO IV.

1. Form a noun from each of these: humble, grace, brief, separate, contrive, perplex, vile, transgress, abstract.
2. Correct the following:
 How many wings have an eagle?
 Learn me and him this lesson.
 Who does the coat belong to?
 My horse is larger than your's.
 Every child in school should get their lesson.
3. Give the nominative and possessive plurals of—on, pony, woman, son-in-law, and chief.
4. Show by examples, one of each, that you understand—Predicate Nominative, Nominative of Address, Point of Interrogation, Objective after a verbal noun, a Noun in apposition. Tell which each example illustrates.
5. Use italicized words:
 "A government issuing paper currency is a bank making its own reserve, changing the amount at will, and exempting itself from all penalties."

GEOGRAPHY.

III. TO IV.

1. What is meant by the climate of a country? Name the various circumstances by which it is influenced.
2. Name the provinces, districts, and territories of Canada.
3. In what counties are Marmora, Orangeville, Seaforth, Petrolia, Windsor, Oakville, Aurora, Ingersoll, Fergus, and St. Mary's.
4. Name the mineral products of Canada. Tell the province in which each is found in the greatest abundance.
5. State the direction and outlet of any ten Canadian rivers.
6. Give the position of Walkerton, Collingwood, Strathroy, Penbroke, Georgetown, and Lucan. Name a railroad passing through each.
7. Why is it colder in winter than in summer?

ARITHMETIC.

III. TO IV.

1. From the end of a pile of wood 100 ft. long, 6 ft. high, and 4 ft. wide, 5 cords and 120 cubic feet are taken. Find the length of the remainder.
2. How many acres in a piece of land 789 yards long and 114 perches wide?
3. A skating rink is 120 ft. long and 50 ft. wide; how many gallons of water will cover it to the depth of 10 inches? A gallon equals 277 cubic inches.
4. Find the smallest number that will exactly contain any one of the following: 12141, 17271, 5301.
5. By using factors, find how many cubic ft. in 19131712168111-30111 cubic inches. Tell how to find the correct remainder.
6. To the difference between $11\frac{1}{2}$ and $13\frac{1}{3}$ add such a number as will make the sum $17\frac{1}{6}$.
7. What is the cost of plastering a room 20 ft. long, 16 ft. wide, and 10 ft. high, at 20 cts. per sq. yd.?
8. 10000 lbs. of tea are put into boxes, an equal number of each, containing 4 lbs. and 6 lbs. How many will be required?

Notes and News.

ONTARIO.

At the last meeting of the Durham Teachers' Association the following address was unanimously adopted and ordered to be sent to Mrs. Davis, wife of the late S. P. Davis, M.A., of Pickering Colloge:

"We, as a Teachers' Association of the County of Durham, cannot allow this convention to close without expressing our sincere sympathy with you in your sad bereavement.

We desire to accord our feelings of sorrow for having lost a member from our midst who had endeared himself to us, not only by his suavity of manners, but by his gentlemanly bearing and scholarly attainments.

We shall ever remember Mr. Davis as a true friend to our Association and of education generally. He was one of the first members of the Teachers' Association of East Durham, and was a decided favorite among its members. Little did we think last June when we listened with so much interest to the able address and timely advice given by him to the Teachers of Durham in the Port Hope High School, that in less than six months a kind but unerring Providence would see fit to remove our friend "to that undiscovered country from whose bourne no traveller returns."

"From the world's broad field of battle,
From the bivouac of life."

Again we ask you to accept our sincerest sympathy for you in your present severe affliction.

Signed in behalf of the Association,

D. J. GOGGIN, *President.*
G. A. ANDRUS, *Secretary.*

H. M. Hicks, M.A., late head master of Trenton high school has been appointed head master of Colborne high school instead of S. Burwash, M.A., resigned.

H. E. Kennedy, M.A., has accepted the headmastership of Trenton high school at a salary of \$1000 per annum. The vacancy in the head mastership of Cayuga high school, caused by his appointment, has been filled by the promotion of A. Cole, B.A., late mathematical master.

The Trenton Board of Education are alive to the growing interests of their high school. Besides other important improvements they have made some valuable additions to the school laboratory and library of reference. The appointment of H. E. Kennedy, M.A., as head master has given the greatest satisfaction. An inspection of the school time-table shows that earnest work is meant this term.

The London model school, under the head mastership of Mr. W. Carson, is making good progress. There are at present twenty-five teachers in training.

At the convention of the South Hastings Teachers' Association last month a remarkably practical feature in the proceedings was a record of "Mistakes in Teaching" observed by the inspector, Mr. Johnston, in the course of his visits to the schools of the county and city. Of course no names were mentioned. If this system were more generally carried out in teachers' meetings, not in the spirit of blame or reproof, but with a desire to improve the working of the school system, the style of teaching, the deportment of the teacher, and the mutual relationships between teacher and pupil, it would be productive of great benefit.

As the result of much industry and ingenuity Mr. J. H. Knight, inspector of East Victoria, has produced a set of maps illustrative of the railway system of Ontario, in minute detail and correct to the most recent dates. Mr. Knight has confined his exposition to railways running in accordance with time tables. He will make a valuable addition to his work if he adds maps of such new railways as the Ontario and Quebec, the Canada Atlantic, and others, which are under construction and will soon be completed. It is needless to say that he has a scheme of geographical and chronological facts to accompany the maps. He exhibited and explained his system at the last meeting of the East Victoria association of which he is president.

J. C. Morgan, M.A., the energetic inspector of public schools for North Simcoe has lately added to his responsibilities by entering the state of matrimony. All his fellow educationists will join in wishing him an ample meed of felicity.

At the recent North Simcoe convention one of the best speeches was made by a lady, Miss Lafferty, in the course of a discussion on reading and literature. It is greatly to be regretted that so few ladies take part in the proceedings of conventions. They might add greatly to the interest and benefit themselves if they would follow Miss Lafferty's example.

Educational matters appear to be in a satisfactory condition in Orillia. The public school is fortunate in being located in a good building and Mr. McKee, the head master, is evidently the man to make the most of his opportunities. Few places can boast of a

system and appliances equally perfect. The high school is doing equally well under Mr. Ryerson, whose reputation as a teacher was thoroughly established before Orillia was fortunate enough to secure his services. Orillia is favorably situated for growth, and if one may judge from its educational condition its future is assured so far as it depends on the public spirit of the people.

Barrie collegiate institute, which has been steadily doing good work in the past bids fair to do still better in the future. It is in contemplation to make it still more efficient under Mr. Spotton's principalship in 1883.

Notwithstanding the increase of school accommodation in Toronto it is always insufficient, a clear proof of the continuous and rapid increase of population.

A. F. Ames, B.A., silver medalist in mathematics in Toronto university, and at present assistant in Whitby collegiate institute, has been appointed mathematical master in the collegiate institute at St. Thomas. He enters on his new sphere in 1883.

On the afternoon of Sunday, October, 24th, a large deputation, representing the Anglican, Presbyterian, and Methodist churches, waited on the Hon. Mr. Mowat, Premier of Ontario, to urge upon the government the expediency of making some change in the departmental regulations respecting religious exercises in public schools. Among those present were the following ministers and laymen:—Church of England—Bishop Hellmuth of Huron, the Chief Justice of Ontario, Hon. G. W. Allan, Rev. Mr. Langtry, Provost Body, of Trinity College, of Toronto diocese; with Rev. Canon Belt, Canon Dixon, and Mr. W. F. Pettit, of Niagara diocese; and Rev. Mr. Middleton, of Oshawa, and G. B. Kirkpatrick. Presbyterian Church—Rev. Dr. Cochrane, Moderator of the Assembly; Rev. John Laing, Rev. J. Smith, Rev. Mr. Cameron, Rev. Mr. McLeod, Rev. Mr. Milligan, and Messrs. Dr. Macdonald, John Thompson, of Sarnia, W. T. McMullen, of Woodstock, and James Brown. The delegates had met during the forenoon and organized themselves into a conference, which was presided over by the Rev. Mr. McMullen and at which the following resolutions were unanimously adopted:—"That this Conference pledges itself to press upon the Attorney-General the making of the reading of the Holy Scripture by the children and teachers, together with the prescribed prayers issued by the department, an obligatory exercise at the opening of the public schools of Ontario, the passages of the Holy Scripture to be read each day being prescribed by the department in conformity with the recommendation of the committee of this conference, or some other representatives of the various churches of Ontario, regard being had in all cases to the provisions of the consolidated public school Act, Vic. 37, cap. 28, sec. 142, providing that any parent who has conscientious objection shall be entitled to withdraw the child from such instruction; and that this conference press upon the government the necessity for a return to the Scriptural and moral instruction contained in the first series of national readers issued by the educational department for use in the public schools of Ontario, or for some similar Scriptural instruction." These resolutions were supported in moderate speeches by several of the conference, and the Attorney-General replied, stating the law on the subject now and promising to give the matter his earnest personal attention. The Premier was cordially thanked by the chairman of the conference for his courteous response to their representations.

The *Varsity* for the academical year 1882-3 has made its appearance, and there are in its pages indications of increased vigor and more powerful-grasp. The second number speaks out boldly respecting some desirable reforms in and about Toronto University and University College.

MANITOBA.

The seventh annual convention of the Manitoba teachers took place at Winnipeg, on the 13th and 14th of October; Ven. Archdeacon Pinkham, Superintendent of Protestant schools, in the chair. Amongst those present were: Mr. W. A. McIntyre, Secretary; Mr. J. B. Somerset, Inspector, Winnipeg. The following city teachers:—Messrs. E. L. Byington, M.A., Principal of the Normal School; J. Fawcett, B.A., Principal of the High School; W. A. McIntyre, E. A. Garrott, J. D. Hunt, E. A. Blakely, J. Reid, J. C. Acheson, N. Howitt, F. Shore, F. F. Kerr, the Misses Wright, McEwen, Eyres, McLroy, Archibald Johnson, Mabee, Dickson, Garwood, Bella Hargrave and Martha Hargrave; the Misses Saunders and Flummerfelt, Normal School students; and the following teachers of Provincial Schools:—Misses A. E. Smalley, St. Andrews; J. McGuire, West Kildonan; J. M. McGregor, North Springfield; D. McKinstry, Balmoral; Miss Burk, Rockwood;

Miss Barber, Dufferin; Mr. W. Eccles, Ossowo; Mr. F. A. Schultz, Millford, Mr. Alexander Acheson, St. James, Mr. A. H. Monkman, North High Bluff. The first paper was one by Mr. Byington, on "The Teacher Out of School," in which he was advised to cultivate gentlemanly deportment, associate with both pupils and parents, prepare carefully for his classes, and keep himself thoroughly abreast of the intellectual progress of the day. After a discussion, in which Messrs. Acheson, McIntyre, Garratt, Fawcett, Hewitt, Somerset, and the President took part, and the transaction of routine business, the President delivered his address. He adverted, at the outset, to his recent creation of a collegiate department in the Province in connection with public school work. One secondary school has been commenced in Winnipeg, and another was contemplated in Portage. In Brandon where, a year ago, there was no school at all, there are now from 250 to 300 scholars in attendance, and a collegiate institute is talked of. It had been considered expedient to establish also a normal department, in order that they might train their own teachers, and such a department is now in operation. He commended Messrs. Fawcett and Byington, the principals of these departments, to the association, and believed their appointments would be justified by their success. He paid a high tribute to the late Dr. Ryerson, and the system he founded in Ontario, but believed they would yet have an equally good system at less expense in Manitoba. A committee was formed to frame a scheme for the formation of local associations, to be worked in connection with the provincial association, Mr. Somerset being named the convener. A paper on Music by Mr. Hunt was illustrated by class recitals, consisting of calisthenic songs and sight reading of the tonic sol fa notation, of which Mr. Hunt is a warm advocate. Remarks in its favor were subsequently made by Messrs. Hewitt and Somerset, and a vote of thanks was accorded to Mr. Hewitt and his class, on the motion of Mr. Byington. The first item on the second day's programme was a normal class exercise by Miss Inglis, who illustrated the phonic method of teaching reading. This led to an interesting discussion on the teaching of reading and spelling, in which Messrs. Fawcett, Garratt, Somerset, Byington, Hewitt, McIntyre, Blakeley, Eaton, Bamford, Reid, and the President took part. Mr. Garratt next read a paper on drawing, in which he recommended strongly the practice of designing instead of mere copying. This was followed by a paper from Mr. Somerset, on "The Necessity of Normal Instruction," in which, after speaking of the power of the teacher over the characters of his pupils, he dwelt upon the extent to which during the past few years new and improved methods had superseded old and clumsy ones. He referred to the extent to which normal facilities were supplied in New York and Ontario, as compared with the small number of teachers with a normal training, and accounted for the disparity by the shortsightedness of the people, who were unwilling to pay liberally enough for the services of good teachers. He hoped to see the day when every teacher, before getting a license, would be compelled to undergo a professional training. Discussions on the papers by Messrs. Garratt and Somerset then took place, after which Mr. T. A. Bernier, Superintendent of Roman Catholic schools, at the request of the President, briefly addressed the convention, and announced his intention to have a similar one organized for the mutual improvement of his own teachers. Mr. Lindsey, of the Winnipeg Business College, read a paper on "Penmanship," in the course of which he gave a sketch of the history of the art, and of the instruments used in writing, from the ancient reed to the modern pen. His analysis of script characters into their elements was illustrated by the use of the blackboard. He deprecated sticking too closely to stereotyped headlines, and advised teachers to restrain scholars from eccentricity and flourishing. After some time spent in discussing the programme of studies, it was adopted for rural schools, the President having acknowledged his obligations in the framing of it to Mr. Somerset and his predecessor in the city inspectorate. With Professor Bryce, of the Manitoba College, in the chair, votes of thanks were passed to the President, and to those who had prepared papers for the convention. A motion of appreciation of Mr. Eaton's little work on English grammar was also carried, after which the convention adjourned.

NOVA SCOTIA.

The Teachers' Association of District No. 5 (Counties of Hants and Kings) held its third annual meeting in Wolfville, on the 5th, 6th, and 7th of October. The first business of the association was the election of officers for the ensuing year, the following being chosen: A. J. Denton, Principal of the Kentville Academy, Vice-president. J. F. Godfrey, Principal of Hants County Academy,

Secretary-Treasurer; and Mr. Pineo, Mr. Craig, Misses McKeen and Calhoun, Executive Committee. After some preliminary work Miss McKeen of Wolfville school gave an illustrated lesson on "Color and Form." This lesson clearly proved that the mind of the child can be made to grasp quite difficult points and retain them when presented in a proper way. Miss Blackadar followed with a paper well written and very practical, subject, the "Teachers' Stipend." This called forth considerable discussion, in which Dr. Allison, superintendent of education, Mr. Roscoe, inspector of district No. 5, Mr. Denton, and others took part. Through the kindness of the authorities of Acadia College the Academy Hall was opened to the association for its afternoon session. Accordingly quite a large number of teachers and others were present. At the second session of the association Mr. Sedfield read the first paper on the subject of "Text-Books, their use and abuse." This was a paper of great interest and brought out an animated discussion. Dr. Hall of the normal school being present made a few remarks on the "Text-Books of History." Mr. Elliott then followed with a paper on the "Study of Geometry." He advanced some ideas concerning the study of that science, which, if followed out, would greatly increase the interest in it. His paper was spoken to by Mr. Coldwell, Professor of Science in Acadia college, and warmly endorsed by Dr. Higgins, Professor of Mathematics. The association adjourned for the purpose of visiting the museum and library of Acadia college kindly opened for inspection. At 8 p.m. a public educational meeting was held in the college hall. The president of the association was in the chair. Dr. Allison was the first speaker. He spoke of existing misconceptions concerning the work of the teacher, concerning the moral influence of our schools, concerning the effects of our present system of education. He contended that the public did not view the educational work in the same way nor test it by the same standards as they apply to ecclesiastical and political organisations. Dr. Sawyer, president of Acadia college, was the second speaker. He gave an encouraging address to the teachers, aiming to make them more contented and more earnest in the work in which they were engaged. He said the teacher was one of a vast army seeking to promote the moral, physical, and intellectual growth of the world. He proved clearly that the difference between the workman at his work and the professional man engaged at his profession depended on the fact, that the latter held a vastly more responsible position than the former, and this great responsibility gave dignity to the profession. He compared the teacher to the artist who labors energetically and untriflingly to make himself master of certain principles, not for the principles' sake, but for what may be gained from their use. Dr. Higgins then followed with a short address, in which he compared the status of education of the present day with that of thirty-five years ago. He thought vast progress had been made and gave some very conclusive and amusing facts to substantiate his statement. If, he said, we do not all hold the same views with regard to the political course adopted by Sir Charles Tupper, we at least agree that by the introduction of the present school law he conferred an inestimable boon on Nova Scotia. He thought teachers should study more the character of their pupils and all must not be treated in the same way. He was pleased to hear (as he had heard that afternoon) teachers discussing how, and when, and where to present certain subjects to their pupils. It is only when a fact has the power of promoting mental growth that it is worth presenting, and this fact the teacher should constantly keep in mind. Dr. Hall of the normal school was the last speaker of the evening. After some remarks concerning the normal school the Dr. said the æsthetic side of education was too much neglected. The surroundings of school houses were not beautified or adorned as they should be, neither was sufficient care taken with the interior of those buildings in which the child is to be educated. Much education is obtained through the perceptive faculties, and as our great aim at the present day is more refinement among not only our men but our women, he contended that the surroundings of the school-house, the building itself—both inside and out—should be made attractive. He hoped ere long to see this matter more particularly attended to. Friday morning was occupied in listening to a very amusing paper by Mr. Bishop on the "Professional Relations of Teachers." Miss Parsons of the Wolfville school then read a carefully prepared paper on the "Method of Teaching Reading." Dr. Hall contended that reading was not as important a branch of education as many considered it. Mr. Parker of the Canning school followed with an address to the association, in which he strongly urged every teacher to devote more time to study, to attend some college, and by no means fail to spend a term at the normal school. Mr. Denton fol-

lowed with a paper on "Compulsory Education." This paper gave evidence of much thought on the part of its author. He urged upon every teacher the necessity of using every means to bring about compulsory attendance at school. He agreed in the main with Mr. Harrington's Bill. One or two points seemed to them objectionable, and he introduced to them the following resolution: "Resolved, That this association highly approves of compulsory attendance at school, and strongly urges upon the Government of Nova Scotia the great desirability and imperative need of an Act to secure the better and more regular attendance of pupils, and further resolved, that the present proposed Act is defective and will, in the opinion of this association, prove abortive through want of proper stringency and want of legislation to secure the regular attendance during the eighty days, and moreover it is the opinion of this association that the eighty days should be eighty consecutive days." The superintendent of education, when not disposed to combat the theoretical principles enunciated by Mr. Denton, reminded the association that no legislation could of itself cure the evil of irregular attendance at school. Earnest effort on the part of men of enlightened minds to create a higher educational sentiment in the country, attractive, scholarly, enthusiastic teachers can never be dispensed with as a means of securing the end sought. The afternoon session of Friday was occupied by Professor Coldwell, president of the Acadia college science club, who delivered an illustrated lecture on "Physics." This was a new feature at the association, but one highly appreciated. The last session of the association was devoted to an illustrated lecture, by Mr. A. J. Pinceo, on the "Story of the Earth."

Mr. W. Mortimer McVicar, has resigned the principalship of the Truro public and model schools to take charge of the new Baptist academy at St. John, N.B. The vacancy at Truro has been filled by the selection of B. McKittrick, B. A. (Dalhousie, 1877). The appointment of Mr. McKittrick secures for Truro the services of an energetic and efficient principal. Under his management, aided by a sympathetic and progressive board of trustees, the county academy at Sydney has attained during the past few years a commanding position among the high schools of the Province.

The attendance at the Provincial normal school for the ensuing session promises to be unprecedentedly large.

W. D. Dimock, A. M., for several years principal of the model school, Truro, has received the appointment of Secretary to the Fishery Commission at Ottawa. Mr. D. has gifts specially fitting him for this important office.

Mr. Fred Rand has been selected by the board of school commissioners of the city of Halifax to fill the vacancy in the intermediate department of the Morris street school, caused by the resignation of I. F. Davidson, A. B. Mr. Harris F. Corydon succeeds Mr. C. D. Mackenzie in the corresponding department of the Dartmouth public schools.

The Provincial *Journal of Education* for October contains the names of the successful applicants for teachers' licenses at the annual examination in July. The returns show that six (6) candidates received license of the Academic Class (Provincial Grade A); fifty-one (51) licenses of the First Class (Provincial Grade B); one hundred and fifty-six (156) licenses of the Second Class (Provincial Grade C); one hundred and ninety-five (195) licenses of the Third Class (Provincial Grade D).

J. W. Spencer, B.Sc., M.A., Ph.D., F.G.S., has resigned the professorship of Chemistry, Geology and Mining in King's college, Windsor, to accept an appointment in the university of Michigan. The Governors of King's college have secured for the chair thus vacated, the services of Prof. Geo. F. Kennedy, late Professor of Natural Sciences at Acadia college, Wolfville.

The board of school commissioners of the city of Halifax, and the school trustees of the town of Dartmouth, have unitedly effected an arrangement, whereby all the teachers of the city and town are to receive systematic instruction in industrial drawing as preliminary to the introduction of that branch of education into all their public schools. The lessons are given semi-weekly by Miss Smith, art instructor in the normal school.

The well known Yarmouth seminary has been, with the consent and good wishes of its governing board, amalgamated with the public school system of the town of Yarmouth. This movement lays beyond question the foundation of a flourishing and vigorous academy. The action of the proprietors of the seminary has been in the highest degree patriotic and unselfish.

NEW BRUNSWICK.

From the *Educational Circular*, issued half yearly by the Chief Superintendent of New Brunswick, we condense the following account of the Educational institute for that Province, held at Fredericton in July last:—

The institute was presided over by Dr. Rand, the Superintendent. After routine the first item was a paper on "Physical Education, its place and scope in Public School Work," by H. C. Creed, M. A., instructor in the Provincial normal school. The paper is printed entire in the *Circular*, and is a thoughtful and suggestive dissertation on the subject. A paper from Mr. John Montgomery, principal of the Albert school, Carleton, St. John, on "How to Ensure Success in Writing" was followed by a discussion in which Messrs. Dole, Parkin, Montgomery, Chisholm, Creed, Morrison, Lawson, Burnett, Bolyea, Crocket, and Meagher, took part. A paper on "Organization in Ungraded Schools" was read by Eldon Mullin, B. A., inspector of schools for the seventh district and it also was followed by a discussion of the subject. W. Crocket, M. A., principal of the normal school then read a paper on methods of teaching reading to beginners in which he described the alphabetic, phonic, and look-and-say methods, preferring the last named to the others. His preference was more particularly for the sentence as distinguished from the word method. A very interesting discussion followed, the majority agreeing with Principal Crocket in his advocacy of the look-and-say method though some would begin with words rather than with sentences. One speaker objected to that method on the ground that it turned out bad spellers; another had some regard for the old alphabetic method and thought it might be combined with more modern systems. Mr. Creed thought the look-and-say method, which is generally followed in New Brunswick showed better results than the phonic method in vogue in Nova Scotia, but he preferred beginning with words rather than sentences. Dr. Rand thought the sentence method was the word method rationalized. Addresses on the teaching of temperance in the schools were delivered by Mrs. M. H. Hunt of Massachusetts, by Mr. Lawson, Dr. Rand, and others, Mrs. Hunt receiving a hearty vote of thanks for her valuable suggestions. A lucid paper on "Minerals, Plant Life, and Animal Life" was read by Mr. Crocket, and at the request of members of the institute Dr. Rand promised to have it put in the hands of teachers as soon as possible. Before the adjournment a resolution was passed strongly favoring the preparation of an educational exhibit in connection with the Dominion Exhibition to be held in St. John in 1883. The usual votes of thanks brought the proceedings of a very successful institute to a close.

WHAT'S IN A SLEEPER.—A sleeper is one who sleeps. A sleeper is that on which the sleeper sleeps. A sleeper is that on which the sleeper which carries the sleeper while he sleeps runs. Therefore while the sleeper sleeps in the sleeper, the sleeper carries the sleeper over the sleeper under the sleeper, until the sleeper which carries the sleeper jumps off the sleeper, and wakes the sleeper in the sleeper by striking the sleeper under the sleeper, and there is no sleeper in the sleeper on the sleeper.—*Oswego Palladium*.

WEAR AND RUST.

"When I was a boy," said an old physician, "I remember that my father brought home two chains just alike, to use on the farm. It was not long before one was lost, and though we hunted high and low for it, we never could find it. The conclusion probably was that it was stolen, but I don't recollect whether we located the theft on any one in particular. After I had finished my medical studies, I went home one summer for a visit, and it happened that year father moved a great stone pile that had lain on the farm all my days. There at the bottom lay that old chain, which had probably been thrown on the heap and slipped in among the stones. We took it out and tried to use it, but there was no strength in the rust-eaten links; they broke and fell apart at the least strain. The other chain was in use still. The links were worn some, but bright and strong still, and ready for a good deal of useful service.

"I have often thought of that old rust-eaten chain since then, and it reminds me of lazy folks who just rust out their lives. I find in my practice that they are the hardest to cure when they are sick, and that every little thing breaks them down. Good, earnest work, in moderation, is one of the best health-givers I know of. If people of health would practise it, we doctors should have to go out in the corn fields to work for a living."—*Sel.*

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.

SOUTH HASTINGS. Held in central school Belleville, 12th and 13th ult. The president, inspector J. Johnston, ably occupied the chair. The attendance was very large, and at times during the sessions several distinguished visitors from the city and neighborhood were present, who were cordially welcomed. Among them were Revs. D. Mitchell, Shorey, Burns and Dr. Jaques; also Messrs. T. Mills, chairman, board of Education, W. Johnston, Carmichael, T. Holden, school trustees, Belleville; Mr. Massey, school trustee, Sidney, Mr. Matheson, principal of the deaf and dumb institute, with Professor Coleman and Green from the same establishment. The proceedings were characterized throughout by the utmost attention and order, as well by the interest taken in the discussions—a feature which elicited many extremely instructive hints. The exercises were enlivened by organ solos performed by Prof. Stanistreet; and songs and recitations by the members. After opening, the report of Mr. O. S. Hicks, delegate to provincial association was received, and Mr. G. W. Sine was appointed delegate to next meeting. Prof. J. T. Bell gave a brief address on the importance of teachers' conventions as a means of mutual improvement. Mr. W. J. McCammon illustrated, with a class from Miss Simpson's division, the modern methods of teaching reading, which he treated in a masterly manner. Mr. Burke followed with a few well-timed remarks. In the afternoon Mr. J. L. Robertson of the CANADA SCHOOL JOURNAL gave a brief address after which Mr. O. S. Hicks, Sidney, took up the subject of Map Geography and illustrated his method of teaching it. He deprecated the plan of filling children's memories with desultory names easily forgotten, and urged such drilling on the map that the towns and physical features thereon would be impressed on the mind through the eye. As a result, whenever a continent or country was named the map of it would present itself to the mental vision and a better knowledge of locality was thus secured. He advocated map drawing and the use of blank and outline maps. This very profitable exercise was well discussed by Messrs. Rogers, Black, H. E. Kennedy, M.A., Robertson, Burke, and others. Mr. J. Johnston I. P. S. explained the new programme for public schools giving at the same time some excellent practical hints for its successful use. Mr. G. W. Sine introduced the subject of monthly examinations and reports to parents, which was well discussed and resulted in a resolution proposed by Mr. Burke, seconded by Mr. Hicks and unanimously carried, to the effect that monthly written examinations be adopted in the district as helping systematic and uniform promotions in the public schools. *Second Day.* Mr. Wilson showed some simple plans of clearing away difficulties in arithmetic experienced by junior pupils. His plans were combated by Miss Urquhart and Messrs. Naraway and Black. Mr. H. E. Kennedy, M.A. proposed that the next convention be held in Trenton, seconded by Mr. Rogers. Mr. Sims, seconded by Mr. Sine, moved an amendment in favor of Belleville. The amendment was carried by a small majority. Mr. Johnston I. P. S. brought under the notice of the members some mistakes in teaching and discipline he had observed in the course of his periodical visits to the schools. By his kind advice and critical remarks it is evident many weak points will be built up to the benefit of both teacher and pupil. This admirable feature of wholesome, practical instruction is worthy of imitation in other conventions as it is calculated to promote the most beneficial results in school work. In the afternoon Dr. Wright, H. M. Belleville high school, gave an address on "Pupils' Rights", in which he represented the pupil as a miniature citizen of a regularly established municipality where he should learn to govern himself and others with justice and propriety. The teacher is his ruler but not his taskmaster, and the government should be exercised in a manner tending to advance the interests of both. The pupil has a right to the teacher's sympathy and also a right to take part in the teacher's responsibilities. The address was much appreciated and elicited warm applause. The committee on New Readers presented their report highly commending the series published by Messrs. W. J. Gage & Co., which was adopted; and afterwards Mr. Kennedy moved a resolution in favor of the authorization of one series of readers only, which was seconded by Mr. Naraway and carried unanimously. Dr. Wright then took up "Junior Composition." He said that young pupils could be got to write about many familiar things, and relate simple narratives in their own words, but if this operation were dignified with the name of "Composition" they would shrink from attempting it. Failures were chiefly caused by aiming at beautiful language. Mr. Carmichael, school trustee, treated the members to a splendid recital of a poem named "Magdala," which was well received. Thomas Wills Esq, chairman of the Belleville board of education was moved to the chair and Mr. Johnston I. P. S. gave his ideas on uniform promotions with a view to the adoption of the system. On the motion of Mr. Burke, seconded by Mr. Rogers the following committee was appointed to formulate regulations and to arrange for the

system being put into operation:—Messrs. Burke, McCammon, Hicks, Sine, Rogers, Emerson and the inspector. A recitation in gesture expressive of the story of "The minister and the hornets", and another of "Christ stilling the tempest" were given by Prof. Green, deaf mute, of the Belleville deaf and dumb institute, in each of which the remarkable power of expression that gesture is capable of was forcibly shown. Prof. Coleman's duties as interpreter were scarcely needed. Votes of thanks were accorded to the visitors, who acknowledged the same in brief addresses; also to those who took part in the singing and recitations, namely: Misses A. Harrold, White, Carr, Rogers, Bolland, and Robertson, and Messrs. Millburn, Burke, Rogers and Smith.

EAST VICTORIA.—This association held its last half-yearly meeting at Lindsay on Friday and Saturday, the 13th and 14th October, the president, Mr. J. H. Knight, in the chair. After routine proceedings the president gave a practical address, and from time to time during the proceedings he availed himself of opportunities to enforce advice suggested by his own experience as teacher and inspector. At great expenditure of labor and ingenuity he had prepared a series of maps to illustrate the railway system of Ontario, and in a brief prelection he went over that system in detail, giving a clear exposition of traffic routes and geographical relations. Mr. Elliott, of Omemee, gave the convention his idea of the best method of teaching history. Mr. S. Armour read a thoughtful paper on "School Government" which elicited a brief but interesting discussion. The latter turned chiefly on the expediency of resorting to corporal punishment, and availing himself of what was said by members of the convention the Rev. Dr. Vincent of Chautauqua fame, who was at this juncture introduced to the meeting, delivered a stirring address on the influence of the teacher as a moulder of character. Part of Saturday was taken up with a discussion of spelling reform which was advocated in a brief address by Mr. Houston M.A. of Toronto. The question of school readers was discussed at some length and a resolution was unanimously adopted approving of the "Canadian Readers" published by W. J. Gage & Co. as greatly superior to those now in use and recommending their introduction. As the result of a discussion about the best method of expending the surplus funds of the association for the benefit of the members, it was unanimously resolved to take the CANADA SCHOOL JOURNAL, one copy for each member. The evening lecture expected from T. Kirkland M.A. was dispensed with on account of the public lecture by the Rev. Dr. Vincent the same evening.

DURHAM.—The half-yearly meeting of the Durham Teachers' Association was held in Bowmanville on Friday and Saturday, the 13th and 14th of October. The proceedings were opened by the President, Mr. D. J. Goggin, Principal of Port Hope Public Schools, and, after the usual preliminaries, the subject of Promotion Examinations was introduced by Inspector Tilley. He told what he had done toward arranging the next promotion; he expressed his entire satisfaction with the result of the past examination, and asked for hints that would be useful in the future. He further suggested the advisability of holding township associations—in connection with the first promotion examination, and so having but one county convention in the year—this to last say three days. The subject was discussed by Messrs. Barber, Ellis, Keith, Reynolds, Symons, Tamblyn and the President, and finally left over till Saturday for further consideration. Mr. G. W. Ross, M. P., Model School Inspector, then gave an address on "Mistakes in Reading." He began by asking those present to suggest difficulties in reading that they had met with in their own schools. Some eight difficulties were at once given, and he proceeded to deal with these, showing how they might be removed. The first difficulty considered was—Monotony; the remedies proposed were imitation, phrase reading, simultaneous reading, and patience. Too low and too loud reading were next discussed and the remedy given for these, as for too fast and too slow reading, was chiefly simultaneous reading. Hesitation, stammering, indistinctness, and faulty enunciation were next taken up, their causes mentioned and remedies proposed. Other defects were noticed in the same way and an address, replete with interesting information, was brought to a close by a model lesson to a class in the first book, to impress the fact that the basis of all good teaching lies in an intelligent appreciation of the meaning of what is read and an honest effort to express it in pure sympathetic tones. The next subject taken up was "The best Method of Teaching Language," by W. W. Tamblyn, M.A., Head Master of Bowmanville High School. He enunciated two principles as governing all teaching of languages; first, repetition of correct speech; second, reproduction. The teaching of grammar at an early stage, indeed the teaching of it at all before the use of it is felt, was strongly condemned. The reception of such answers in oral work as are full and correct, was insisted on, and the interchange of vowel sounds and word building was adverted to as two principles, the knowledge of which would materially assist the teaching of language. Illustrations from the French and Latin were given to show the value of these principles. In closing he urged strongly the value of mixing in society, where good speech is the rule, and to read good books and familiarize. Messrs. Tilley, Keith, Goggin, Ellis and Grigg followed in a few remarks on the subjects of Reading the Language, and favored generally teaching by use of objects where

practicable. Messrs. Keith and Goggin were not so much in favor of establishing a "museun" in school, unless the trustees would foot the bill. The former favors the "fancy" or imaginative system; the remarks of the latter bore only upon the theory he did not favor. Inspector Tilley followed, dwelling on vocal gymnastics, distinctness of articulation, etc. After this an animated discussion, *pro* and *con*, on Object Teaching followed. Dr. McLaughlin, who was present, joined in the discussion, expressing his warm sympathy with the objects of the association and his pleasure at the intelligent way in which the subject had been discussed. Mr. Van Mercer, of the Philadelphia School of Oratory, addressed the meeting on the subject of Elocution; after which Mr. Bonbright gave illustrations of the various tones of the voice, reading short selections. Mr. Goggin read an excellent paper on "The Country Boy, his Value and his Needs." That the country boy is invaluable was naturally inferred as the reader and his hearers were representatives of the country. The needs of the country boy were rehearsed, and those in connection with the study of grammar, geography and arithmetic were considerably discussed by Messrs. Gilfillan, Barber, Tamblin, Grigg and Tilley. Mr. Ross then gave an admirable address on "The Teacher's Decalogue," which subject was changed into "The Teacher's Pentologue." The commandments were as follows: (1.) Thou shalt not have any other profession. (2.) Thou shalt not make unto thyself any counterfeit of thy profession. (3.) Thou shalt not speak lightly of thy profession. (4.) Remember your holidays to keep them sacred. (5.) Honor thy trustees, *that thy days may be long in the land*. The Association passed a resolution in sympathy with the bereaved Mrs. S. P. Davis, and in expression of their deep regret of Mrs. Davis' departure from their midst. The question drawer was then taken up by Messrs. Ross, Tilley, and Barber, and a couple of hours were very profitably spent. Resolved, That the Association send to the Minister of Education a resolution expressive of disapproval of a certain clause in the Act pertaining to the superannuation of teachers, and the expression of its desire for a remedy. After a vote of thanks to Mr. Ross, and his election as an honorary member of the Association, the meeting adjourned.

WEST BRUCE.—On the 12th and 13th of October the West Bruce teachers held their half-yearly meeting in Kincardine. Mr. D. F. Ritchie was elected president, in the room of G. W. Bowman, who has been appointed to a collegiate position in the United States. After a discussion of the question whether it was most profitable for a teacher to attend convention or visit other schools, Mr. A. H. Smith performed a number of experiments illustrating combustion. Dr. McLellan then took up the "A B C of Arithmetic." At a later period in the session he discussed the subject of "Sympathy," and also that of "Reading in Schools," all of which he handled in his usual effective manner. Mr. J. C. Pomeroy read an essay on "The Origin of Language," Mr. Rennie one on "The Times," and Miss Jessie Thomson one on "Have an Aim." Illustrated prelections were given by Mr. H. H. McKague on map and geometrical drawing, and by Mr. Powell on "English Literature." On Thursday evening Dr. McLellan delivered in the town hall his attractive lecture on "Ten Years of Educational Progress," the audience being large and appreciative.

EAST GREY.—The teachers of this district met in convention, on the 12th. and 13th. of October. The election of officers, which was the first item of business, resulted in the choice of the following: president, A. Grier, S. inspector: V. president, G. Lindsay; sec. J. Farewell; treasurer, R. Hamilton. The subject of Promotion Examinations was discussed, and a committee composed of Messrs. Whyte, Hodgson and McKinnon appointed to confer with the N. and S. Associations on the matter. The subject of Mensuration was introduced by the secretary and very ably discussed by Messrs McKinnon, Tait and Hodgson. Mr. Tait then gave a very excellent paper on the Kindergarten system of Education which caused much instructive and interesting criticism. The Rev. Mr. Washington then gave an address on "Aimless study," for which he received a cordial vote of thanks. A musical and literary entertainment was given on Thursday evening to a good audience. The subject of "teacher's certificates" was introduced by Mr. McKinnon, and after the matter had been reported on by a committee it was resolved that only one professional examination, instead of three, should be required. After a discussion of the question of "Corporal Punishment" Mr Hodgson gave a statement of his method of teaching mental arithmetic, which led to a good discussion. Mr Tait discussed recent changes in grammar, and Mr. Grier, promotion examinations. Mr. Henderson explained his method of teaching music, and Mr. Whyte introduced the subject of object lessons. "Proportion vs. Unitary Method" was the subject of an address by Mr. Tait, and the topic was afterwards discussed at some length. The next meeting will be held at Meaford.

STORMONT.—The eleventh half-yearly meeting of the teachers' association for the county of Stormont was held in the high school building, Cornwall, on Thursday and Friday the 5th & 6th of October. The programme was very fully and ably disposed of. A larger number than

usual of teachers was in attendance and the meeting throughout one of most profitable that has been held. The president in his opening address called attention to the recent changes made in the school law. He also referred to the proposed alterations in the management of the superannuation fund, furnished some very interesting statistics regarding the government aid afforded, the cause of education in the different countries of the world, and expressed the opinion that teachers' engagements with trustees should be permanent, subject only to dismissal on three months' notice. The secretary took up the subject of arithmetical fractions, explaining the principles upon which their correct treatment depends, and illustrating by examples the methods of proof for the various rules given. Mr. Casselman in a very pleasing manner showed how the useful but much neglected art of drawing might be successfully taught to the average school pupil. Mr. Harrington disposed of commerial arithmetic, percentage, commission, discount banking and exchange, they were all elucidated by means of problems that plainly presented the principles involved in the processes pursued. Mr. McGregor favored his fellow-teachers with an exposition of what he considered the best and easiest as well as the most beneficial, system of acquiring a familiarity with the events, their causes and consequences, of which history treats. Mr. Milden gave an interpretation of the general principals of education, abounding in practical suggestions and important directions as to how those principles should be applied to the work devolving upon the teacher. Mr. Raney read an exceedingly wise production on the subject of "Ignorance" which was so much appreciated that its publication was requested. Mr. McCallum gave a lecture on natural science, forcibly impressing upon the minds of the teachers present the desirability of making it a subject of instruction in their schools, and endorsing the prophecy that as a study, nat. science must eventually supersede classical literature, being of greater practical value. Mr. Smith read an elaborate essay on the life of Burke, reflecting much credit on the author of the "Reflections," and no less upon the writer of the life-sketch presented. On the evening of the first day of meeting the secretary delivered a lecture in Kirkpatrick's Hall on "The achievements of the age." It was decided to hold the next meeting at Newington on the first Thursday and Friday in February 1883. Votes of thanks were tendered to all those who had contributed to the success of the meeting and the association adjourned.

CÆSAR'S DEATH.

The most dramatic description we have ever read of the closing scene in Cæsar's life is the following, by Froude: "The Ides of March arrived; omens of dire import had cast their shadows over the household; Cæsar's wife was disturbed by a ghastly dream of the previous night, and at her request, Cæsar, who, contrary to his usual habit, had given way to depression, decided that he would not attend the Senate that day. The house was full: the conspirators in their places with their daggers ready. It was announced that Cæsar was not coming. Delay might be fatal, and his familiar friend was employed to betray him. Pœcunius Brutus, whom he could not distrust, went to entreat his attendance. It was now eleven in the forenoon, and Cæsar shook off his uneasiness and rose to go. As he crossed the hall, his statue fell, and was shivered on the stones. Some servant who had heard whispers wished to warn him; but in vain. Antony, who was in attendance, was detained, as had been arranged, by Trebonius. Cæsar entered and took his seat. His presence awed men in spite of themselves, and the conspirators had determined to act at once, lest they should lose courage to act at all. He was familiar and easy of access: they gathered around him; he knew them all. There was not one from whom he had not a right to expect some sort of gratitude, and the movement suggested no suspicion. One had a story to tell him, another some favour to ask. Tullius Cimber, whom he had just made Governor of Bithynia, then came close to him with some request which he was unwilling to grant. Cimber caught his gown, as if in entreaty, and dragged it from his shoulders. Cassius, who was standing behind him, stabbed him in the throat. He started up with a cry, and caught Cassius' arm; another poniard entered his breast, giving him a mortal wound. He looked around, and seeing not one friendly face, but only a ring of daggers pointing at him, he drew his gown over his head, gathered the folds about him that he might fall decently, and sank down without uttering another word. Cicero was present; the feelings with which he watched the scene are unrecorded, but may easily be imagined. Waving his dagger, dripping with Cæsar's blood, Brutus shouted to Cicero by name, congratulating him that liberty was restored. The Senate rose with shrieks and confusion, and rushed into the forum. The crowd outside caught the words that Cæsar was dead, and scattered to their homes. Antony, guessing that those who had killed Cæsar would not spare himself, hurried on into concealment. The murderers, some of them bleeding from wounds which they had given one another in their eagerness, followed, crying that the tyrant was dead, and that Rome was free; and the body of the great Cæsar was left alone in the house where a few weeks before Cicero told him that he was so necessary to his country that every Senator would die before harm should reach him."

REVIEWS.

A Grammar of the Modern Spanish Language, as now written and spoken in the capital of Spain. By William J. Knaggs, Professor in Yale College. Boston. Ginn, Heath & Co., 1882. There is certainly room for such a grammar as this professes to be. Although Spanish has been practically, but we hope only temporarily, banished from our Provincial University, still a knowledge of the language is exceedingly useful, and, that too, not only to those whose sole object is to acquire a speaking knowledge for practical purposes, but also by those who study it for its literature, or as an important member of the Romance Group of Languages. Very much less has been done in the way of presenting the language of Castile to the student in a scholarly form, than is the case with its sisters, French and Italian. Professor Knaggs's Grammar will render, we believe, the study of the language rapid and pleasant, at least to one who has studied other modern languages, but we cannot help regretting that the author has not given the derivation of, at least, such words as are found on every page of a Spanish book. A few derivations are, indeed, given, but no grammar, we think, is quite perfect which does not recognize the wants of the student who wishes to observe the growth as well as the actual forms of the language. A second edition, however, may see this want supplied, especially as a very few pages would have to be added. From our examination of the book we may congratulate learners on their having, through this grammar, a pleasanter path to pursue than we had through a weary, interminable, planless "Ollendorff."

THE ODYSSEY OF HOMER, done into English prose by S. H. BUTCHER, M.A., of University College, Oxford; and A. LANG, M.A., of Merton College, Oxford. New York, Macmillan & Co., Toronto, Wilting & Wilhamsen. This work is specially interesting at present to the student of Greek, coming into our hands, as it does, almost immediately after the keen contest in Edinburgh for the occupancy of the chair recently vacated by Professor Blackie. The successful applicant was Mr. Butcher, one of the translators of the present English edition of the Odyssey. This work carries on its surface the marks of high scholarship: not only do the translators show a due appreciation of the relative value of the Greek and English idiom, but a point and importance are given to the English equivalent of the numerous Homeric particles, which we think must deservedly raise the work in the estimation of every admirer of this great ancient epic. We have seen translations of the Odyssey that aim at a more brilliant and ornate style than the present, but we are not acquainted with any that outshine this in the terseness of its English, in the neatness and pith of its diction. In translations of Homer this seems to us a new departure; the language is essentially English, and if it be "the choice of a somewhat antiquated prose," as the editors intimate in the preface, we venture to say that it is a style that will commend itself not only to Homeric scholars, but also to the great majority of students of English. We hail with much satisfaction a translation of the Odyssey done into English as we see it preserved to us in the Bible or Shakespeare. On this point we take the following from the prefatory notice:

"Homer has no ideas that cannot be expressed in words that are 'old and plain'; and to words that are old and plain, and, as a rule, to such terms as, being used by the translators of the Bible, are still not unfamiliar, we have tried to restrict ourselves. It may be objected, that the employment of language which does not come spontaneously to the lips, is an affectation out of place in a version of the Odyssey. To this we may answer that the Greek epic dialect, like the English of our Bible, was a thing of slow growth and composite nature; that it was never a spoken language, nor, except for certain poetical purposes, a written language. Thus the Biblical English seems as nearly analogous to the epic Greek as anything that our tongue has to offer."

The brief notes that accompany the work are chiefly of a philological and archaeological character, and are "meant to elucidate the life of Homer's men." They embody the results of the most recent investigation, presented in a very scholarly manner, but we should have preferred to see them scattered through "he work as "foot notes," rather than collected at the end as they are. We can only regret that the annotations are not more copious and numerous; but the authors inform us that "some day they hope to write at length on Homeric syntax and

Homeric forms of words, as well as on the heroic society of the poet's age." An excellent article by way of introduction is given on the composition and plot of the Odyssey, and the events of each day of the six weeks occupied by its action are given in the order of their occurrence, and form a neat and clear synopsis of the whole. In addition to this each book is prefaced by the argument taken, with slight alterations, from the translation of Hobbes.

MAGAZINES.

The ATLANTIC MONTHLY for November has been received. The plots of the two serial stories, "Two on a Tower" and "The House of a Merchant Prince," are thickening and the crises approaching. "Rube Jones" is a capital short story. George S. Wilson, a lieutenant in the American army, in an interesting article gives his views as to how the Indians are to be civilized. Charles Dudley Warner contributes "A Ride in Spain." There are, besides, an additional instalment of "Studies in the South," a good notice of Daniel Macmillan, the publisher, and a number of other articles on various subjects. The number fully maintains the reputation of the magazine for the literary excellence and interest of the menu it provides.

The most interesting articles in the November number of the NORTH AMERICAN REVIEW are one on "English Views of Free Trade" by John Welsh, and on "The Pretensions of Journalism" by the Rev. George T. Rider. Mr. Welsh was formerly United States minister to England and while a resident there he made himself acquainted with the speculative and political opinions of the various English schools of thought on the matter relating to trade. In this paper he argues strongly in favor of maintaining the United States protective system, but he bases his arguments on national exclusiveness just as other protectionists do. In his view everything sent out of the country is a draw upon it, and it is better to be self-contained, consuming at home all that is produced at home, than to encourage the growth of international trade. Whether a system erected on such a basis can long stand the able assaults of teachers like Prof. Sumner remains to be seen. Mr. Rider gives full credit to modern journalism for enterprise and ability, but criticises for its presumption. The New York Nation invented some time ago the phrase "trial by newspaper" to describe the American journalistic fashion of subjecting all kinds of disputes to their own analysis and verdict, and this phrase sums up in a condensed form one of Mr. Rider's criticisms. He is, as might be expected, particularly severe on Sunday papers, to the malign influence of which he attributes the diminished power over the people.

CENTURY for November is the first number of a new volume and it is a splendid beginning. One of the most striking articles in it is a sketch of the novelist, Henry James, junior, by his brother novelist W. D. Howells, which is all the more valuable from a literary point of view because it gives incidentally a partial glimpse of the progress made in novel writing as an art. The profusely illustrated articles are on "Venice," "A new Profession for Women," "The Beginning of a Nation," and "Sculptures of the Great Pergamon Altar." It is needless to say that in these both letter-press and engravings are fully up to the high Century standard.

ST. NICHOLAS for November is also a first number and a good one. It contains the opening chapters of what promises to be one good serial, "The Story of Vitean" by Fran. R. Stockton, and another "The Tinkham Brothers Tide-Mill," by J. T. Trowbridge. These admirable letters of young people's stories need no words of commendation from us. What comes from them may be taken on trust. Amongst the sketches (illustrated) are "A Boy in the White House, who was the son of Abraham Lincoln, and "Torpedoes," in which the terrific power of these machines is graphically described. There are besides these a multitude of good things in prose, verse, and picture, too numerous to mention.

HARPER'S YOUNG PEOPLE, which is a weekly and not a monthly visitor, has during October pursued the even tenor of its pleasant way. "The Cruise of the Carrol Club" is a most entertaining sketch which manages to break off in each weekly instalment at the most interesting point. The article on "Piano-Playing in the Time of Mozart and Beethoven," is accompanied by a good portrait of the latter. "Some Hints on Dog-Teaching" will capture the boys.

ONTARIO EDUCATION DEPARTMENT.

EXAMINATION FOR TEACHERS CERTIFICATES, 1883.

The subjects of the Examination for Teachers' Certificates in July 1883 will be those of the curriculum of which notice was given in March last, as modified by the amended Regulations of 31st July, 1883, excepting:—

- (1.) The subjects of *Physiology and Hygiene*, which, being professional, will be examined upon at the end of the County Model School session.
- (2.) The subject of *English Literature*,—in which there is an option available by every candidate of "Goldsmith's Traveller" for "Marmion."
- (3.) *Drawing* is made optional and is placed under item 7c, which will read "French and German" or either of these with "Music or Drawing." (Intermediate Examination.