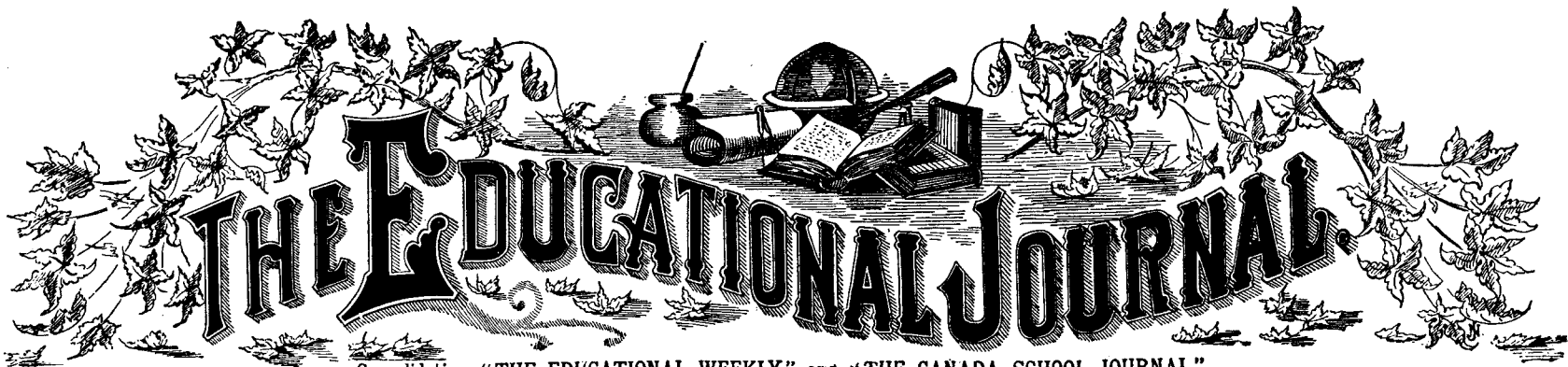


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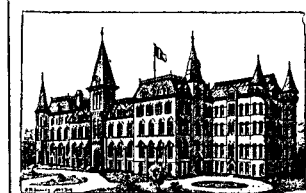
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OFFICIAL CALENDAR

—OF THE—

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March:

22. High Schools close, second term.
[H.S. Act, sec. 42].
23. Good Friday.
26. Easter Monday.
27. Annual Meeting of the Ontario Educational Association at Toronto.
28. Toronto University Examinations in Medicine begin.
30. Night Schools close (session 1893-4).

ANNUAL EXAMINATIONS, 1894.

No ices.

- April 1. Application for Specialists' Certificates of all grades to Department due.
- May 1. Applications from candidates for the High School Entrance, Commercial and Public School Leaving Examinations to Inspectors due.
- May 3. Inspectors to report to Department number of candidates for same.
- May 24. Applications for the High School Primary, Junior and Senior Leaving Examinations and University Pass and Honor Matriculation Examinations to Inspectors due.
- May 25. Inspectors to report to Department number of candidates for same.

Examinations.

- May 1. Examinations for Specialists' Certificates (except Commercial) at Toronto University begin.
- June 27. High School Primary Examination in Oral Reading, Drawing, Bookkeeping and Commercial course begin.
- June 28. High School Entrance Examinations begin. Public School Leaving Examinations begin. Kindergarten Examinations at Toronto, Ottawa and Hamilton begin.
- July 3. The High School Primary, Junior Leaving and University Pass Matriculation and Scholarship Examinations begin. The Commercial Specialists' Examinations at Toronto begin.

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TORONTO, MARCH 1, 1894.

Vol. VII
No. 20.

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Editorial Notes.

THROUGH an inadvertency "Science" was included in the "Crowded Out" department of last number. It appears in this issue and will also take its regular place again in the next.

IN the English Department of last issue was given the first of a series of notes on the Literature Selections for the Public School Leaving examination. These papers, which will be continued from time to time, are being prepared specially for the JOURNAL, in response to the wishes of fifth-form teachers. We predict that they will be found highly useful and suggestive.

WE have received between thirty and forty time-tables for the prize competition. We are sorry that, owing to our having failed, up to the time of going to press, to hear from one of the gentlemen invited to act as judges, we are unable to announce the names of the committee of award in this number. Arrangements will be completed with as little delay as possible and the names of the successful competitors will be announced as soon as a decision is reached.

THE practice of betting is one of the wide-spread vices of the day. The essence of all betting is gambling. No argument is needed to show that gambling—staking money on the chance and in the hope of getting the property of another without paying an equivalent—is immoral, in every shape and form. The point we

wish to make here is that the foundation of the vice is often laid in the schools. The thoughtful and judicious teacher can do much to counteract it by discouraging the practice of betting of which many boys are so fond. Children should be taught that betting is both vulgar and wrong, and should be shown why it is so.

THE very valuable article by Professor Munn, which was published in our last number had been on hand for some time, having been crowded out of our Christmas number, for which it had been selected by the Mathematical Editor. We feel sure that our readers, especially those of them who have mathematical leanings, will agree with us that the permission to publish the article was too good a thing to lose.—Under the heading "Miscellaneous" we had in the same number a sketch by Sir Edwin Arnold which we commend to the attention of every reader. It is worth careful reading not only for the excellent pedagogical moral which it conveys, but for the literary charm of the style in which the story is told. We omitted to call attention to these two articles in the number in which they appeared, but do so now lest some reader should have overlooked them.

THE evils of cigarette smoking by boys are very great and we fear that the Ontario law, forbidding the sale of tobacco to minors, is not very strongly enforced. The law is, we believe, wise and good, and all who wish well to those who are soon to be men amongst us should aid in its enforcement. There is, however, a more excellent way to reach the very desirable end. A late number of the *N. Y. Independent* says:—

"The Anti-Cigarette Smoking League, started by Charles B. Hubbell, of the Board of Education, in the grammar schools of this city, is having quite a success, and the principals of the schools and the boys themselves show great interest in it. The boys pledge themselves upon honor not to smoke cigarettes before they are twenty-one years old. The league is spreading to the public schools in other cities.

There is nothing like voluntaryism, so far as it can be made successful. Why not have anti-cigarette leagues in all our schools in which there is a tendency to this health-destroying vice? With a little tact and enthusiasm most boys could be drawn into the movement, to the life-long good of many.

The following note was crowded out of last number: "Julius Cæsar," as a theme for

an essay, has not the charm of perfect freshness, and it must have required no little courage on the part of the youthful writer of the paper which we have published in our "Special" department to try his ploughshare in so hard-beaten a field. We do not suppose that he will be able to inspire older readers with his own glowing enthusiasm, and we do not know that we should wish him to be wholly successful in infusing his own ardent admiration of the great Roman into the minds of younger ones. Cæsar was first of all and above all a self-seeker, and was not scrupulous as to the means by which he sought to attain his ends. With all his wonderful genius, both military and literary, he was far from worthy to become the ideal of a nineteenth-century Canadian. But the essay presents on the whole a well-written and comprehensive summary of one of the most wonderful men of all time, and one with whose story all well-informed persons should be familiar. The sketch shows the results of much thoughtful study. It will be specially useful to those who may be reading or preparing to read the "Commentaries."

How many of the teachers under whose eyes these paragraphs may fall are really enjoying their work? We ask the question for this reason, amongst others: the degree of enjoyment which one finds in the work is a measure of his or her fitness for it and success in it. Mark, we do not say the only measure, but a most important one. It is a question whether anyone, in any profession or sphere of labor, can do the best work of which he is capable until he has learned to find a real pleasure, a positive sense of enjoyment, in the doing of it. Of course, in the teaching profession some are much more happily circumstanced than others. There are many who are overworked and under-paid; many who have to struggle on day after day amidst the most depressing discouragements. We know full well how hard it often is under such circumstances to maintain even a moderately even and cheerful deportment, to say nothing of either enthusiasm or delight. Perhaps the most trying position of all is that of the teacher of the ungraded country school, where one has to struggle on without assistance, "himself against a host." But even here energy, method, and a cheerful courage will often accomplish wonders. We are heartily sorry for the teacher whom one occasionally meets who owns that he or she regards the work of the school-room as drudgery, dislikes it intensely, and means to get out of it as soon as possible. We pity still more the pupils of such a teacher.

English.

All articles and communications intended for the department should be addressed to the ENGLISH EDITOR, EDUCATIONAL JOURNAL, ROOM 20, 11½ Richmond Street West, Toronto.

ZLOBANE.

M. A. WATT.

IN introducing this lesson, the usual plan may be varied. The class take paper and pencil and write down words as dictated by the teacher, the Readers lying open before the pupils. As the teacher reads, she gives (or gets) the meanings of the following words:—swayeth, stalwart, serried, unrecking, secure, flank, crescent, uprose, reeled, doom, awful, strife, disdain, fray, scanned, flee, nigh, astride, farewell, quivering, sonorous, spurning, clanged, sire, pang, long-knitted, weapon, supple, assegais, unflickering, unblenching, aim. If the teacher sees any phrase that her class may not understand, she should re-arrange it into an easy form for her class to grasp, as she reads, making a running commentary. The words given may be re-written as a home-exercise and the lesson resumed next day.

Second Day's Work.—Teacher presents the story to the class; if it has been already told, let her repeat it and use the black-board to show the British resting after their victory, the wily Zulus creeping up, the crescent closing on front and flank. No elaborate picture is needed, the rudest strokes will do, the active imaginations of the children will put life into the dots and dashes you make, a few inch-long lines around a central spot being the weary British, a crescent-shaped row being the "serried Zulu shields." The class is now ready for the reading. The pitch of voice should be suited to the sentiment, therefore there will be a change in what we might call the *key*, especially if concert reading be practised. At first the class should read silently, then the teacher read aloud. The first stanza is a statement of a fact not yet known to have a sorrowful bearing, and it should be read as one would read the commonplace fact, told with apt comparing of the field of grain to the closely arranged rows (serried) of Zulus. The second gives a statement of an interesting piece of information about the Zulus' care for the home and the value they place upon the married man as compared with the single man (white shield, twice need of life.) A low tone on the third stanza, gives force to the idea of the British resting (were they asleep? why do you think not?) and excites the imagination to see the creeping silently of the enemy upon the unsuspecting victims. A sudden change of key upon the fourth stanza, the words of the first part being given in shocks, will present an idea of the surprise of the British, and the class will be ready to put themselves in the place of the soldiers, as they read:—

Uprose the *British*; in the shock,
Reeled—but an *instant*—; then,—
Shoulder to shoulder—*faced* the foe,
And met their *doom*—like men.

(The grouping of words is my own, another might group them differently, but they should be grouped). Here the class feel that the story is told; they will now feel like stopping to consider the bravery of the British and to tell, perhaps, of some one they knew or read of, who did brave deeds in some battle or another. It will, perhaps, be as well to go on to the second part, as soon as possible. Here is one plan of interesting them in the new part.

"But, children, here on the next page, I find something about a man, whose knees struck together, he was so frightened; listen,

"Knee smiting against knee,
He scanned the hills if yet were left
An open way to flee."

Was he a *coward*, then?"

The thoughtless who answer in the affirmative are speedily corrected by the thoughtful, and the interest is then easily carried on to the end. The question of the boy's right to disobey his

father; the reasons for the father's "joy" and for his "pang;" and the difference in guilt in the father's killing five Zulus then, and any person killing five men in a rage at any time; were questions which came up the last time the writer taught this lesson, and some thoughtful answers were given, showing a disposition toward earnestness and rectitude. There was no flippancy of treatment of the moral aspect of these rather abstruse points. They, also, compared this boy's conduct with that of Casabianca; the hero of Zlobane clearly being the favorite. The last stanza recalled the young soldier of Ratisbon who "smiled" as he fell dead beside Napoleon, and his reason for smiling.

The idea of "long-knitted friends" seemed impressed by the simile of two trees growing side by side, their delicate threads of roots intertwining and mingling together until it would be impossible to disentangle them without injuring the life of both.

Transposition is needed all through this lesson, which seems so simple to the grown-up mind. The *first* stanza, the *tenth*, *eleventh*, *thirteenth*, *fourteenth*, and *sixteenth* stanzas are those likely to present difficulties in the way of clear mental vision to a child.

This is a good lesson for the boy with a false ideal of bravery, the admirer of a *Corbett and Mitchell* stamp of courage. It presents danger, death and bravery sanctified by love, not degraded by hateful passion and mere physical power. It gives the teacher a chance to commend the true spirit, while tacitly (or openly, if judged advisable) denouncing the false.

For review, the "Story of Zlobane," should be written and rewritten, in the pupils' own words. Questions may be asked and answered on meanings of words and phrases; on the thought; on the moral sentiment; and quotations and similes (such as in stanzas *one*, *three*, *five*, *eight*, and *fourteen*); and comparisons with previous lessons can be made (as Casabianca, etc.). A good question for a thoughtful class would be to explain why the Colonel "smiled in death" after he had passed through such a terrible anguish as he had suffered while seeing his boy murdered and also through the dreadful final act of his own life.

"Miss Watt," said Willie, afterwards, "how did they find out all this?"

Henry, with fine scorn, "Huh, weren't there six men and a captain escaped? You ought to read your own lesson, Willie!"

I had forgotten the note at the top of the lesson, but Henry had not, evidently.

THE PREPOSITION.

Topic. Some words express *relation* between things (chiefly relation of place), and are used to join the words which express these things. A word of this class is called a *preposition*.

Introduction. Development of the idea expressed by "relation"; literally, the carrying of the thought from one thing to another.

Development. 1. Teacher places a book on the table.

2. Pupils make a statement as to where the book is. Bring out "The book is on the table." Bring from the class that three words will express this, "book on table." Place these three words on B.B.

3. Teacher holds the book under the table.

4. Pupils make a statement about new position. "The book is under the table." The three important words selected and placed on B.B., "book under table."

5. Bring from the class the fact that the second group of words shows a *change of place*.

6. Bring from the class the word which shows or tells this change of place—the word *under*.

7. Now call attention to *on*, and lead the pupils to see that if we think of the *things* book and table, as spoken of above, *on* and *under* show a relation of place between the *things*, and the words "on" and "under" in the groups of words join the words *book* and *table*.

8. Bring from the class such groups as "book

at, *over*, *above*, *near*, *beside* the table"; "pencil *through* ring"; "ball *from* hand to wall, etc., giving good drill.

Generalization, Technical Term, Definition. As in former plans.

Practical Exercises. 1. Skeleton sentences; pupils supply prepositions.

2. Prepositions; pupils place them in sentences.

3. Pupils pick out prepositions from page of "Reader."

THE CONJUNCTION.

Topic. Some words are used to join other words, or to join statements. A word of this class is called a *conjunction*.

Introduction. Review statement and word. Lead the pupils to understand "joining" by reference to the cars of a train, or some similar illustration.

Development. 1. Teacher writes on B.B. the following sentences:—

- (a) Cats catch mice;
(b) Cats catch birds.

2. Teacher asks for a *shorter* way of telling these two stories, obtaining "Cats catch mice and birds."

3. Attention called to the change; particular reference to the new relation of the words *mice* and *birds*; they are joined or linked together.

4. Attention called to the word which joins them or links them—*and*; its function, it joins these two words.

5. Other illustrations; as,—

- (a) John came to see us;
(b) Mary came to see us.

6. Pupils combine as before, "John and Mary came to see us."

7. Sentences on B.B.; thus,—

- (a) John went to Toronto;
(b) James went to Toronto;
(c) William did not go;
(d) He was sick.

8. Lead pupils to combine, obtaining the following: "John and James went to Toronto; but William did not go because he was sick."

NOTE.—It is quite possible that in combining, the pupils may use *and* a second time, instead of *but*; lead them to see that the idea introduced by *but* is something *taken away* from the important statement rather than something *added*; therefore we cannot use *and*.

9. Take other examples, introducing *or* and *nor*; "John *or* James will arrange the maps after school." Lead the class to see that if this order is given, *both* will remain until one is selected.

Generalization, Technical Term, Definition. As in former plans.

Practical Exercises. 1. Pupils pick out conjunctions from sentences on B.B., or from page of "Reader."

2. Skeleton sentences; pupils supply conjunctions.

THE INTERJECTION.

Topic. Some words in the language express *feeling* or *emotion* (joy, pain, sorrow, surprise, etc.). They do not combine with other words, but are, as it were, *thrown into* the sentence.

Introduction. A review of the *statement*, with special reference to how it is made up.

Development. 1. Teacher says to class, "Not long ago I heard a little boy say 'Hurrah!'"

2. The class is questioned as to how the boy must have felt while he was saying this word. What made him say it? How did he say it? (The class say it.)

3. The word is placed on B.B., with exclamation mark.

4. Teacher says, "I did not hear the boy say anything else, but I knew he felt glad, joyful. How did I know?" Bring from class that the

word itself make this known to us; that it expresses this joy.

5. The class is questioned as to the feelings of a person who shouts *Oh*.

6. Bring from them that this word expresses pain, pity, joy, surprise.

7. Introduce *Ah! Pshaw! Help! Hark! Fire!* etc., in a similar way, leading the class to see that, together with *special* words expressing feeling, any part of speech may be so employed.

Generalization. Two aspects: all these words are used to express feeling, and make sense of themselves, not requiring other words to help them by combining with them.

Technical Term, Definition, Practical Exercises. As in former plans.—From *Plans for Grammar Lessons*, by Dr. MacCabe.

Science.

Edited by W. H. Jenkins, B.A., Science Master Owen Sound Collegiate Institute.

BUTTERFLIES AND MOTHS.

THERE are no more interesting objects in Natural History, for study, than these beautiful insects. In richness and variety of color they are probably not surpassed in the animal creation. For observational work they are preferable to any other group of the Insecta, being larger than the majority, while the different stages of their development can be easily observed. Boys can be made to take an intense interest in them by collecting and feeding their larvæ, — caterpillars, and watching them pass to the pupa and imago stages. It is unfortunate for our Senior Leaving Science Students that these insects are most abundant in July and August — a time when their school work is over and they are wrestling with Examinations. Cabinet specimens can be utilized, however, with a little care, as follows:—Two or three days before the specimens are required, cover the bottom of a dish with wet sand, over which lay tissue paper, then place the dried specimens on this, and cover. The body, wings, and legs become pliable and observational work can be satisfactorily done.

Butterflies and moths belong to a class of the Insecta called Lepidoptera, — scaly-wings. The question is often asked, — how can you distinguish a moth from a butterfly? There are several distinguishing remarks, but the most constant as well as the most noticeable is the possession of knobbed or club-like antennæ by the butterflies, while the moths do not possess these. The following points may be found interesting to young readers:—The most obvious characteristic after the colors, is the covering of hairs and scales with which the body and wings are clothed. The eyes are compound, having, according to Mr. Scudder, from 1500 to 4000 facets in a square millimetre. The mouth parts are adapted to sucking. A great deal of their food is obtained from flowers, into which their sucking-tubes are thrust and the nectar drawn up. Their legs are small and weak. Do you often see a butterfly walking? When the insect is resting, what is the position of the wings? Butterflies often migrate to the South on the approach of cold weather. They deposit their eggs on leaves in June and July; these hatch in four or five days and the young caterpillars begin at once to eat their egg-shells and the leaves on which the eggs were laid. In about three weeks the caterpillar has reached its full size. Its stumpy legs have tiny hooks. Try to lift a caterpillar from a leaf. When ready to become a pupa or chrysalis, it spins a mass of silk, fastening it to some object, and then attaches itself to the silk by means of the last pair of hooked legs. When in this position its skin splits and eventually forms a covering for the chrysalis. It remains in this pupa stage about twenty days. When it first breaks its case it is weak and timid but in good sunlight a few hours give it strength to fly away a perfect butterfly or moth. Some of the moths however remain in their cocoons nine months or more.

PROJECTION.

AT THE close of a term's work, it is desirable to bring under review, in as complete a form as possible, and with the expenditure of the smallest

amount of time, the whole course which has occupied the attention of the students.

In Botany and Zoology this may be done perhaps to the best advantage by using the projection microscope. Most schools now possess a *porte-lumiere*. By the expenditure of a small amount of money, the necessary microscopic attachments can be procured and the prepared "slides" used during the term can be projected on a screen so that a class of forty can be directed in a few hours over a considerable portion of the work. Even without the microscopic attachments, the usual forms of lantern slides may be easily prepared, and by placing a suitable lens in front of the beam of light very satisfactory results may be achieved.

Lantern slides may be prepared by several methods. The glass plate, usually three and a quarter inches square, is first warmed, then rubbed lightly with paraffin, after which it is held in the smoke from burning camphor. When an even coat of soot is deposited allow to cool. Then trace with a sharp-pointed steel the figure to be illustrated, e.g. a floral diagram, the circulatory system of a fish, a cross section of a horsetail, the sporangia of ferns, etc. Illustrations may be copied from any book on Zoology or Botany. If a proper series of these has been prepared the whole course in Zoology can be illustrated in a few lessons.

Another method for preparing the slides, is to moisten the glass slide with saliva and allow to dry. The glass may then be placed over an illustration and copied through in ink without fear of running.

If you are acquainted with a publisher who has the original wood cuts you can get a printer to make a "copy" on mica—very thin, or gelatine films. June is the month for review work and it is also the month of bright sunny days when sunlight, the best of all illuminants, can be secured. It is doubtful whether this method should be used in *teaching*, at least until the student has had considerable practice in actual dissection and microscopic work.

A *porte lumiere* or its equivalent, the arc-lamp or the lime light, is one of the most necessary pieces of physical apparatus. It should never be used, however, merely to show the skill of the teacher.

SIMPLE EXPERIMENTS IN CHEMISTRY AND PHYSICS.

TO ILLUSTRATE the use of the Davy Lamp: Light a gas jet and set it in front of another burner, interpose a sheet of fine wire gauze, turn on the gas in the second burner so that the gas strikes against the gauze.

To show hydrochloric acid gas contains hydrogen: Fit a glass tube about six inches long and one quarter inch thick with perforated rubber corks. In the tube place several small pieces of sodium, connect one of the ends of the tube with the flask generating the gas and the other with a test tube filled with water over a pneumatic trough. Now heat the sodium. What collects in the test tube?

The loudness of a sound dependent on the density of the enveloping medium: Fill large bell-jars with hydrogen and carbon dioxide. As each is lifted up from its support, ring a small bell in it. Inference? Loudness of sound dependent on amplitude of the vibrations.

Strike a tuning fork; observe the loudness of the sound; then as quickly as possible thrust one prong under the surface of water.

Again strike the fork and when the sound is not so audible as in the first case, again thrust water. What do you observe in the behavior of the water? Inference?

ANSWERS TO CORRESPONDENTS.

R. H. G., BELLEVILLE.—Ques.—How much potassium will be required to decompose 110 grammes of carbon dioxide.

Ans.—The equation:
 $2K_2 + 3CO_2 = 2K_2CO_3 + C$
represents the chemical change.

2 (39.1 × 2) grammes of K decompose 3 (12 + 32) grammes of CO₂. That is, 132 grammes of CO₂ require 156.4 grammes of K, from which the amount required to decompose 110 grammes is easily calculated.

I. M. N., MISSOURI.—Your problem has been forwarded to the editor of the mathematical department.

Miscellany.

GUARDED, VERY.

TEACHER—"If your mother had twenty yards of stuff, and made a dress requiring eighteen yards, how much would she have left?"

Little Girl—"Mamma can't make her own dresses. She has tried often, and they are always either too—"

Teacher—"Suppose she sent it to a dress-maker, how much would the dressmaker send back?"

Little Girl—"Depends upon which dress-maker she sent it to—some wouldn't send back any."

Teacher (impatiently)—"Suppose she sent it to an honest one?"

Little Girl—"Some of the honestest ones cut things to waste, so that there is never anything left, no matter how much you send 'em."—*Good News*.

CURIOSITIES OF SCHOOL EXAMINATIONS.

RECENT ANSWERS.

The earth goes 'round on its axis. The earth's axis is a pole put through the centre of the sun, which turns it 'round, and thus we get the seasons.

The Equator is a line running through the centre of the earth; at one end is the Tropic of Cancer; at the other the Tropic of Capricorn.

The Nile is the most remarkable river in the world. It was discovered by Dr. Livingstone, and it rises in Mungo Park.

Constantinople is the Golden Horn; a strong fortress, has a university, and is the residence of Peter the Great. Its chief building is the Sublime Port.

Cyprus came into our possession in 1878, and was given to Lord Beaconsfield.

The Boers are the wild people of Cape Colony.
—*Catholic Educator*.

WHAT IS PLAGIARISM?

THE following are eight definitions given by different applicants for a school appointment in a Western State of America. The presumption is that the offence defined is not so well known in those parts as certain writers would lead us to suppose it is among ourselves:

1. Plagiarism is an occult science.
2. Plagiarism is the act of plugging.
3. It is the state of believing differently from the majority of people.
4. It is the act of telling falsehoods about an opponent.
5. It is downright meanness.
6. It is having the disposition to fight.
7. It is something made correct by usage.
8. I do not know, unless it refers to the power of witching.—*Educ. Times, London*.

CAN YOU EXPLAIN THIS?

WE find the following in an exchange: The following curious puzzle beats the celebrated "13-15-14," and is well worth investigation. Take a strip of paper or cardboard thirteen inches long and five wide, thus giving a surface of sixty-five inches. Now cut this strip diagonally, as true as you can, giving two pieces in the shape of a triangle. Now measure exactly five inches from the larger end of each strip and cut in two pieces. Take these slips and put them into the shape of an exact square, and it will appear to be just eight inches each way, or sixty-four square inches—a loss of one square inch of superficial measurement, with no diminution of surface. What becomes of that lost inch?

THE purpose of moral education is not to add to a pupil's knowledge but to affect his will.—*Anon*.

THE enlightenment of the intelligence is essential to the growth of a clear and finely discriminative moral sense.—*Scully*.

AN Oriental exhibitor wished to announce to customers that purchases would have to remain with him until after the juries of award had made their announcement, and placarded this: "Goods sold will not be delivered until judgment day."—*Harper's Drawer*.

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AND THE ADVANCEMENT OF THE TEACHING
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J. E. WELLS, M.A., EDITOR AND PROPRIETOR.

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Editorials.

TORONTO, MARCH 1, 1894

AMENDED DEPARTMENTAL REGULATIONS.

ON Monday last the Minister of Education laid before the Ontario Legislature the following Orders in Council, which have recently been passed, amending the Departmental Regulations with respect to the granting of Teachers' Certificates in some important points. The following are the changes ordered:

First—That regulation 41 be amended to read as follows:—

(1)—The standing of the second, third and fourth years in arts., after a regular course in any chartered university in the British dominions, will be accepted by the Education Department in lieu of the primary, junior leaving, and senior leaving examinations respectively.

Second—The said regulation 41 is further amended by adding thereto the following sub-sections (3) and (4):—

(3)—Any person graduating after a regular course with honors, at any university in Ontario, in English, mathematics, classics, or French and German, shall be ranked as a specialist in the department in which such person so graduated, on passing the examinations prescribed for the Provincial School of Pedagogy.

(4)—The Minister of Education may, on the joint report of the High School inspectors, grant a certificate as a specialist to any graduate actually engaged as a principal or assistant in any High School or Collegiate Institute on July 1st, 1885, who has taught continuously in a High School or Collegiate Institute since that date, and whose department, on inspection prior to

January 1st, 1894, was twice graded first-class, and one or more of whose pupils have taken honors at the matriculation examination of any university in Ontario.

Third—Regulation 52 (4) is hereby repealed and the following substituted in lieu thereof:—

(4)—Third-class certificates may be extended by the Minister of Education, on the joint request of any Board of Trustees and the Inspector, to complete the term of the teacher's agreement with the Board of Trustees, or where after due inquiry through the Inspector or by advertisement a qualified teacher could not be obtained; but such certificate shall be limited to the school on whose behalf the application is made. Third-class certificates may be extended during pleasure on a similar petition in the case of teachers of ten years' experience, who can furnish satisfactory evidence of good conduct and efficiency.

The general tenor of these changes is, we think, in the right direction. They are really a following up of the sound principle which was recognized in the appointment of a joint Board of Examiners for conducting matriculation and departmental examinations. We have always been of opinion that, apart from professional training and experience, general culture is of far greater importance in members of the teaching profession than any amount of information in regard to a few subjects, which may be supposed to have some special relation to the practical work of the profession, can possibly be, apart from such culture. We quite agree with the *Globe* that, "a young man who has spent one year at a university is surely as well qualified for the rank which the department now confers upon him, even though his studies may cover different ground, as the young man who simply passes the primary examination. The great tendency of the profession is towards narrowness and detail. Even universities are not free from the degenerating influence of too much specialization. The broader the culture of the teacher the less pedantic will the work of the school-room become." In fact we should be disposed to go a good deal further. Without in the least disparaging the value of the professional training imparted in the various training institutions, from the County Model School up to the School of Pedagogy, we should not hesitate, were the choice of a teacher for any grade of school necessarily restricted to the alternatives of a young man or woman who had received a good general education without a professional course, and one who had completed a professional course without any tolerably thorough general training, to prefer the former, believing that where the mind-culture is present, with the various facilities now available in books and educational journals, the professional knowledge may

soon be acquired, while unless a good foundation has been laid, or special qualities of mind are possessed, the reverse process is much less likely to be carried out. And nothing is more certain than that a man or woman of culture is constantly exerting, by mere presence and contact, a powerful though unconscious educating and refining influence, to say nothing of the better ability for understanding the mental structure and individual needs of the young.

We dare say that we shall not be far astray in assuming some degree of official inspiration in the *Globe's* editorial article. On that assumption the following paragraphs are not without special interest for teachers and others aspiring to become such.

"The additional facilities afforded for obtaining the rank of specialist in a High School will no doubt prove of advantage also. In the case of teachers engaged in the profession in 1885, when authority was given by statute for the appointment of specialists, the test applied is a very reasonable one and recognizes professional skill as an essential qualification in teachers of the highest grade. In the case of those who desire to become specialists in the future, university honors are a prerequisite; then follows a course at the School of Pedagogy, with the usual examinations, and two years' actual experience in High School work. Having passed these tests and proved themselves capable as teachers by actual service in the school-room, their title to specialists is recognized without further examination.

We understand the Senate of the University will be asked to confer the degree of Bachelor of Pedagogy upon those who submit to certain examinations, to be prescribed by statute in that behalf. Should the Senate take this step, the teaching profession will then take its rank with the other learned professions of the Province. The recognition may have been long in coming, but, having regard to the standard on which it is likely to be based, we believe it is quite as well-deserved as any other degree that the university now gives.

By the third regulation submitted to the House the department aims to conserve the House the department aims to conserve the average life of the Ontario teacher does not exceed eight years. It too often happens that just about the time he is beginning to do the most effective work, some younger aspirant for distinction, but without experience, enters into competition with him and drives him out of the profession. While it is not as a general principle desirable to encourage the holders of third-class certificates to rest content with the limited attainments which such certificate represents, still it is found from experience that many third-class teachers do excellent work in the school-room. Literary qualifications are not a necessary guarantee of professional skill, and where, as by the proposed regulation, efficiency has been demonstrated by experience and sustained by

proper evidence, we think the department is acting wisely in endeavoring to retain such persons in the profession."

We will just add that, while cheerfully granting that exception should be made in the case of third-class teachers of middle-age who have had long and successful experience, we always think that the young man or woman who, in view of all the facilities for self-culture or college-culture—we care not which—which are now within reach, can remain content with a third-class, cannot be of the stuff from which good teachers are made. A third-class certificate may be a good beginning, but it is a very poor ending for a teacher's career. By all means let all proper inducements in the way of recognition be held out for the highest literary and pedagogical attainments.

THE IDEAL SCHOOL.

WE pointed out in our last article the insuperable difficulty in the way of making the public school the ideal school, arising from the disproportion between the number of pupils and that of teachers. We have since come upon a paragraph in a paper by President Eliot, one of the highest educational authorities in the United States, in which the impossibility of anything like ideal educational work being done by the teacher who is obliged to look after fifty or sixty pupils is put in equally strong terms. When will parents be willing to pay for the best educational advantages for their children?

In the ideal school, when it comes, the teacher will have another great advantage in that he will be permitted, within wide limits at least, to choose his own textbooks, so far as he may need such helps; arrange his own subjects and courses of study; prescribe school work according to his own discovery of the needs of individual pupils; and, in virtue of his freedom from the strait-jacket of routine, keep up interest by an ever-fresh variety of matter and methods. We have seen somewhere the proud statement of a superintendent or principal of a large number of schools included in a system under his control, in which he averred, with something akin to a boast, that he could tell at any given time during the school day just what everyone of the thousands of children within his jurisdiction was doing at that particular moment. So many hundreds or thousands were just changing classes; so many were reciting a lesson in Arithmetic or Grammar; so many were at something else which he could specify. It is possible that this rigidity of routine may be sometimes necessary under existing conditions, in order to make the most of the time and

materials available. But the very conception of it is enough to make the thoughtful educator shudder. Mathematical precision in movement and uniformity of routine are very desirable in machine work upon inert material, but when the thing to be wrought upon is the human mind, with all its infinite varieties of capacity and characteristic, the idea of such mechanical movement is repugnant to every correct notion of its proper development. It is calculated to destroy as far as possible every spark of originality in both teacher and pupils; to put a heavy discount upon the individuality of each. So it is, we maintain, with every educational system which can treat the minds with which it deals only in classes, without regard to the individual idiosyncracies.

In the ideal school the teacher will not be bound down to so many hours a day in the class room. We are persuaded that the hours in our public schools are altogether too long for the younger pupils, who usually compose the majority. To compel a child of seven or eight to sit still for five and a half or six hours a day in a stuffy school-room and pretend to be reading, or studying, or ciphering, is little short of cruelty. It is flying in the face of Nature, who has written in the child's inmost being her law requiring that the larger part of of his waking hours should be spent in active physical motion. Not only are the restraint and confinement injurious to the health and development of the growing child physically, but at that age it is both a bodily and a mental impossibility for his attention to be fixed for anything like the length of time indicated. But every moment which is spent in trying to teach a child after the power of attention is exhausted is worse than wasted. Not only is the effort useless so far as educational results are concerned, but a habit of inattention is fostered, which may soon become chronic, and cause great difficulty and loss in his subsequent career. From the educational point of view, it is, we believe, an invaluable rule that the effort to retain a child's attention should cease the moment the observant teacher perceives that the little brain is tired and the power of paying attention exhausted. The mind of the child is formed to delight in vigorous exercise up to the fatigue-limit, but that limit is reached very soon in the case of the younger. No doubt the dislike of school and the fancied aversion to study which are so common, are the result in many cases of ill-judged attempts to force attention and mental action after the fatigue-limit has been passed. In view of these facts, which will find ample corrobor-

ation in the experience of every observing parent and teacher, it may be strongly argued that a very valuable improvement might be made in our public school methods, so far at least as the junior classes are concerned, by the adoption of a half-time system, one-half of the children attending in the mornings, the other half in the afternoons. There would then be room left for a reasonable amount of home-work, without, as is now so often done, trenching on the hours which should be sacred to play and rest, and thereby creating a dislike to brain-work, which should be the delight of every healthy child. Another still greater advantage in such an arrangement would be that each teacher's classes would at once be reduced in size by one-half, and the disability of which we have above spoken to that extent removed. But, of course, the parents, especially the less intelligent, would have to undergo a difficult process of education before such a change could be made. Unfortunately too many of them are quite as anxious to have the smaller children kept out of the way for the longest possible period, as for their true bodily, mental, and moral development.

Many other radical reforms suggest themselves as necessary in order to bring our schools nearer to the ideal standard, but we will refer to but one other at present. Such changes as we have suggested would help bring teacher and pupil nearer together in most schools. Some one has said that give him Mark Hopkins seated at one end of a log, and himself at the other end, and he would have a better college than many of those with a large staff. Unfortunately few of us can afford to have a college all to ourselves, or to our children. But with such changes as we have indicated, and some others which we have in mind—especially a great reduction in the number of subjects to be taken up at one time—it might be possible for the faithful teacher to sit down from time to time with the pupils around him or her, for a free talk on some subject of interest, or to go for a walk in the fields or woods, with eyes of both body and mind open to the objects and teachings of nature. With a true teacher, capable of understanding child-life, and knowing how to lead out the child's mind and stimulate its thinking powers in the right direction, the impulses generated in one such walk or talk might result in higher, more real, more lasting progress than usually results from a month of the ordinary drill.

WE crave the indulgence of inquirers for the non-appearance of Question Drawer in this number. Will try to bring it up to date in next issue.

Special Papers.

WRITTEN EXAMINATIONS.

BY JOHN MILLAR, ESQ., DEPUTY MINISTER OF EDUCATION.

The following interesting paper on written examinations was recently read before the students the School of Pedagogy:

Written examinations have a fourfold object. They are intended, (1) to promote the better training of the student, (2) to aid the teacher in his work, (3) to help the public to estimate the efficiency of the school, and (4) to ascertain the fitness of candidates for certain positions. It has been found difficult in practice to separate any one of these objects from the other three, and the discussions which have arisen regarding the utility or evil of examinations are largely the result of the combined aims that have been kept in view. It will be shown, if the question is properly considered, that written examinations cannot be dispensed with, and that the evils associated with them are generally abuses.

ADVANTAGES TO THE STUDENT.

To the student written examinations give information regarding his attainments, showing how far his knowledge is thorough or imperfect. They are often revelations to him of his ability as well as of his weaknesses and defects. They call for the prompt exercise of intellectual energy, which must be self-evolved. They improve the memory, the judgment, and the language of the student. They demand concentration of thought, sustained mental effort, and a ready use of one's resources. As an exercise in English composition an examination in some subjects furnishes a good training in the use of clear, concise, and comprehensive statements.

Written examinations, when expected, serve as a stimulus or incentive to study, and cause the student to become attentive, industrious, and interested in his work. They encourage thoroughness and promptitude, cultivate method and self-reliance, strengthen the will, discourage stagnation and forgetfulness, and afford the student a means of estimating his powers and his progress. They give to his school work a measure of dignity, increase his self-respect, develop a sturdy, honest, independent manhood, and furnish a preparation for the more important conflicts and struggles that are inevitable when school life is over.

ADVANTAGES TO THE TEACHER.

To the teacher written examinations reveal the results of his labor, the failure or success of his methods, the soundness or weakness of his pedagogical principles, and show to what extent he may find it necessary to examine his theories and modify his work. They tell how far his efforts to awaken permanent intellectual activity and to impart real knowledge have been successful. A searching written examination often becomes a virtual eye-opener to an inexperienced teacher, who wanders with his subject, talks a great deal, explains very much, but seldom makes a halt to test results. When several tests of the kind have been employed they show to the teacher the student's trend of thought, his grasp of mind, habits of study, and scholarly development. In some instances they furnish a review of the subjects passed over during a month or term, and tell how far the student is able to make a logical arrangement of the knowledge acquired, and to generalize, or discuss in a topical manner, what has been taken up in a series of lessons.

They enable the teacher to improve at the proper time the classification of the pupils, and make promotions that will command the confidence of both parents and pupils. He is in this way relieved, to some extent, from possible charges of partiality, which might be made, were his promotions based exclusively on his estimate of each pupil's attainments and ability. When several teachers are employed in a school, or when there are several schools under one general supervision, written examinations, directed by the Principal or Inspector, are neces-

sary to enable him to gauge the work of each member of his staff, and thus keep himself informed regarding results, for which he is responsible to the Trustees. Oral tests are doubtless valuable for this purpose, but written questions enable the Inspector to suggest right lines of teaching to those less experienced, and the answers submitted show how far the instruction given is of the proper educational value.

Written examinations also assist the teacher in discovering any natural or acquired tendencies possessed by his pupils, and thereby give him an opportunity for correcting any one-sidedness shown by members of his class. The weakness of any intellectual faculty, or an early abnormal development towards specialization, may receive prompt attention from the broad-minded educationist. The teacher is, moreover, placed in a position to give valuable advice to parents respecting the aims of their children and the callings to be followed in after life.

ADVANTAGES TO THE PUBLIC.

Written examinations serve, though in an imperfect manner, to show the ability of the teacher and the efficiency of the school. The test they supply is a valuable one, but its application should be used with care, and with due regard to the other factors which produce results. Written examinations will often expose defective methods, and ignorance on the part of the teacher. A lack of power to inspire students with interest in their work, and an indifference to their progress, will sometimes be shown as faults of a teacher by means of an impartial examination. When pupils of a school continually pass good examinations, it is an evidence that the teaching possesses some excellencies. It is a fact, however, that good results do not depend wholly on the ability of the teacher. When pupils fail at an examination, it more frequently happens that they rather than the teachers are to blame. The success of a student may be largely affected by his natural ability, his early training, his attainments when he entered the class, his home associations, the time he has given to the course, and the interest he takes in his studies. It would be grossly unjust to hold the teacher responsible for results which, if hereditary tendencies count for anything, may be traced to ancestors who lived at a time when pedagogy was not an exact science, and when written examinations were unknown. It would be equally unfair to blame the teacher for results arising from the unfavorable environment of the pupils. The Trustees may have failed to furnish satisfactory school accommodation, sufficient apparatus or works of reference for the library, and they may have failed to employ the required number of properly qualified assistant teachers. For such reasons, the failure of a school to make a good showing at an examination should not be taken as an unerring criterion of the teacher's professional skill. At the same time, the public will continue to attach importance to the results of examinations, and the popular cry that they are an evil is not seriously believed by any true educationist. To abandon them would be to ignore what we have learned from the science of education, and adopt processes of training which are impracticable as well as unphilosophical.

ADVANTAGES AS QUALIFYING TESTS.

Examinations are indispensable as a means of determining the fitness of candidates for professions, and some other callings in life. Certain positions require the persons who hold them to have qualifications of a special character. Fitness to discharge the duties pertaining to certain callings cannot be ascertained by the general public. For the advantage and safety of the community Boards of Examiners are appointed to frame examination papers, to conduct the examination and to award certificates to those who show the necessary ability, skill, or knowledge. To prepare students for these examinations must form part of the teacher's work. It would be impossible, even if desir-

able, to train the pupils who are to pass qualifying examinations, in separate classes from those who may never enter a High School. As a consequence, the work of the teacher is necessarily influenced by the character of the papers set at qualifying examinations. The style of the questions at his own examinations and the manner in which he conducts the daily recitations have constantly in view the approaching tests of the outside examining body. It is evident the responsibility of Boards of Examiners is great. The entire educational system of the country may be beneficially or injuriously affected by the papers set by a Board of Examiners. The papers should be such as will not only test the power and knowledge of the candidate, but will also place a premium on the best methods of study, and justify the adoption of the soundest pedagogical principles. It is useless to say that teachers should do good work without any thought of preparing pupils for an examination. If the questions are of the proper kind, the teacher who prepares his pupils to pass such examinations will render service of a higher educational value than the one who ignores them from a vain impression that he has acquired superior talents for inspiring a love of learning for its own sake. It must be admitted, however, that the charges made against examinations deserve to be considered, with a view to the elimination of recognized abuses.

CHARGES AGAINST EXAMINATIONS.

The objections raised against written examinations and especially against those not conducted by the teacher, are numerous. It is contended that they foster cramming, induce pupils to learn by rote, cultivate the memory at the expense of the judgment, and prevent the proper assimilation of knowledge. The importance assigned to promotion, but more especially to qualifying examinations, is said to engender a continuing mental strain which often so affects the nervous system as to injure seriously both mind and body. It is charged that written tests, when used by outside bodies, rob teachers of their individuality, crush the germs of originality or independence that might otherwise be developed in the art of instruction, keep the teachers in grooves or ruts, and give rise to methods of teaching that are formal, mechanical, and lifeless. It is, moreover, held that the highest and best qualities of a student cannot be measured by a written examination; that no person but the teacher of the school can do justice to the pupils in estimating their knowledge or ability; and that any estimate made by other authorities is unfair and unreliable.

The indictment is a heavy one, and it must be admitted that many examinations of the past, as well as some yet in vogue, show that the charges are not without some substantial foundation. It may be proved, however, that the objections raised have to do not with the use but with the abuse of examinations. The consideration of the charges in detail is in order.

CRAM.

The most popular cry raised against examinations is that they produce "cram." The term in this connection is used with a great deal of vagueness, and the charge, if sustained, decides nothing useful unless the expression is defined. If it is meant that written examinations lead to hasty, crude, or dishonest preparation they deserve to be denounced. If they call for a statement of merely memorized facts, badly digested knowledge, the repetition of an author's words, or the reproduction of the teacher's language, they have no claim for recognition in any rational system of education. If such are their functions they deserve to be mentioned only that they may be despised. On the other hand, if they tend to develop the intellectual powers of the student; if the questions call for the application of knowledge acquired, rather than a display of what the memory has retained; if they place at a discount information that is not assimilated; if they detect the superficial and give a high value to what is thorough and

broad in the formation of mental attainments; and if they become reliable tests of sound teaching ability, they serve a useful purpose and furnish in themselves exercises of high educational value.

There are some subjects of examination to which the term "cram" is seldom applied. A student is not ordinarily supposed to be capable without due preparation of passing an examination in such subjects as reading, writing, mathematics, or Latin composition. It is sometimes, however, assumed that such departments as English literature, history or chemistry may be "crammed" for an examination, while the process necessary has little permanent value. The assumption does not hold good if the examination has been in these as in other subjects what it may be, a test of intellectual power and properly assimilated knowledge. Unfortunately it is only of late years that examiners have begun to recognize the fact that such departments as literature and natural science may be taught not as "cram" subjects but by methods which have a philosophical basis. No examination serves its true and attainable ends which does not reward the student whose knowledge is genuine and well digested, and bring to grief the one unskillfully or dishonestly taught. If the papers set at an examination are of right character the student whose readiness to "cram" enables him to pass deserves credit, while the one whose inability or reluctance to "cram" brought failure deserves the defeat. These assertions are true, whether the preparation involved a rapid review of a subject already studied or a rapid study of a subject entirely new.

Those who object to the "cram" or vigorous effort made to prepare for an examination forget a few important facts. It should be remembered that the power of getting ready quickly for an hour or a week's contest, of promptly summoning one's resources for some great mental effort, is an admirable and necessary preparation for life. The lawyer is obliged to "cram" from statutes and judicial decisions for the trial of a case in court; the statesman "crams" himself with facts and figures to support his resolutions or to refute the arguments of an opponent; the clergyman "crams" for the preparation of his sermon; the merchant if he wishes to understand the commercial outlook; the professor or teacher if he hopes to present fresh illustrations to his class. In fact no person succeeds in life who is not at times obliged to put forth unusual energy, to use at short notice all his available knowledge and foresight, and to concentrate his thoughts for the accomplishment of some definite object of importance to himself and to others. It is clear that any attempt to secure an education by ignoring the process of legitimate "cram" that an examination demands leaves out of view one of the essential aids for attaining its object.

THE MENTAL STRAIN.

Written examinations, if worth much, demand hard mental work. Intellectual exertion is beneficial, but, like physical exercise, it may defeat its object. Mental exertion should not be too severe or too frequently required, and children with a highly-wrought nervous temperament should be freed from excessive strain. When pupils are promoted to a class beyond their age or attainments, when the work of a year is crowded into six months, and when they are expected to keep pace with classmates of superior ability, it is no wonder that the anxiety of an examination does harm. It is not, however, the examination that is at fault, but the haste to get on, and the bad classification which has been adopted. Less desire for promotion to an advanced class and a wiser organization of the school would have diminished the overpressure and saved the pupils from an unnecessary expenditure of mental force, from much nervous anxiety and harrassing worry and possible bodily collapse. It is no valid argument against written examinations that some pupils have under the strain endangered their health

and even their lives. The battles of life are every day presenting examples of shattered minds and bodies, but human existence is too serious in its objects to abandon on that account the contests which, in more than 99 cases out of every 100, improve rather than injure the physical, intellectual and moral strength of those who engage in such conflicts. It must be conceded at all events that the examples of excessive mental strain which are brought to notice by written examinations call upon teachers and educationists for such adjustments of school work as will remove any of the real causes of the evils of which complaints are made.

Examination Papers.

UNIFORM AND PROMOTION EXAMINATION, UNITED COUNTIES OF STORMONT AND GLENGARRY, NOV. 30TH AND DEC. 1ST, 1893.

GRAMMAR—CLASS III.

"I am sorry, friend," replied the King, "that my ship is already chosen, and that I cannot, therefore, sail with the son of the man who served my father."

1. Tell what part of speech each word in the foregoing is, arranging them properly in columns.
 2. Inflection is said to be "a change in the form of a word to express a change in the meaning." Select four words from the extract that show inflection.
 3. What is gender? Select four words from the extract that are inflected to express gender, and give both forms of the word.
 4. What is number? Express the following words in both numbers, arranging them properly in two columns:—Mice, pennies, fox, wives, deer, house, we, cry, sheaf, geese, oxen, one, fisherman, ladies, foot.
 5. Is there an inflection in walked, and if so tell what it is, and what change in meaning it indicates? Make a similar change in the meaning of run, jump, eat, strike, write, read, whisper, cry, get, fall, and arrange the words properly in columns.
 6. Write sentences showing gold "used" as two parts of speech, and "calm" as three.
 7. How can you tell an adjective from an adverb, and a preposition from a conjunction?
 8. Explain the difference in meaning of boy, boy's, boys and boys'.
- VALUES—No. 1, 30; 2, 6; 3, 10; 4, 17; 5, 15; 6, 5; 7, 8; 8, 10. In lieu of marks for neatness the examiner may add a maximum of four marks each to the values of Nos. 1, 4 and 5, for properly tabulated answers.

GRAMMAR—CLASS IV.

Thou lingering star with lessening ray,
That lovest to greet the early morn,
Again thou usherest in the day
My Mary from my soul was torn.
Oh Mary! dear departed shade!
Where is thy place of blissful rest?
See'st thou thy lover lowly laid?
Hear'st thou the groans that rend his breast?

1. What is inflection? Select four examples of it in the last four lines of the extract, stating what each indicates.
 2. What is a phrase? Select four examples from the extract, and parse each as one word.
 3. What is a clause? Select four examples from the extract, and parse each as one word.
 4. Analyze fully the first four lines of the extract.
 5. Parse fully the italicized words.
 6. What is meant by passive voice? Select an example from the extract. Select three other words that are in the active voice, and change them to the passive voice.
 7. Write four sentences showing the proper use of lie (to recline) and lay (to place), used in the past tense, and the past participle.
 8. Write sentences that will show a proper discrimination in the use of (a) older and elder, (b) many and much, (c) brothers and brethren, (d) peas and pease, (e) between and among.
- VALUES—10 each except No. 5 which is 30.

PROMOTION AND REVIEW EXAMINATIONS, EAST MIDDLESEX, NOVEMBER, 1893.

GRAMMAR—3RD TO 4TH CLASS. TIME 2½ HOURS.

Count 100 marks a full paper; 33 minimum to pass. LIMIT OF WORK.—The sentence, clause and phrase. Classification of parts of speech. Analysis and parsing. (The first twenty-six lessons of the authorized text-book).

Insist on neat and legible writing. One mark off for every mistake in spelling. Pupils may have their text books in Grammar.

1. Analyze the following sentences; models may be found on page 82.
 - (a) The time that you name will suit me.
 - (b) The great traveller, Livingstone, explored the Zambesi, a large river flowing eastward in Africa.
 - (c) Go over the above rhymes again and point out which ones are faulty.
2. Parse the words in the following sentences according to the table in Exercise 58, page 51: I could have won the prize if I had attended school more regularly. Ah! there is an "if" in the way.
3. According to the model on page 59, parse the following words: They are never alone who have companionship with noble thoughts.
4. Tell the kind and relation of each subordinate clause in the following, (quote the clause in full:)
 - (a) The boy who helped us is not here.
 - (b) I cannot find the place where I left the basket.
 - (c) That he made a mistake is quite certain.
 - (d) I came because you asked me to come.
 - (e) The girls read to-day better than the boys did.
 - (f) Come as soon as you can.
 - (g) You saw that he avoided us.
 - (h) The fact that you were to blame is evident.
5. Tell why each pronoun in the following is indefinite, personal, interrogative, relative, or demonstrative, as the case may be:
 - (a) John has a pencil; you may keep mine.
 - (b) She has taken a pencil; may I take another?
 - (c) Which does Mary prefer?
 - (d) That is the pencil which Fred chose.
6. Correct the errors in the following sentences:
 - (a) Was George and Charlie with me when you saw them?
 - (b) Come with Katie and I to the store.
 - (c) I don't know how he done it.

VALUES—1—6, 4, 9; 2—18; 3—15; 4—24; 5—24; 6—6.

HYGIENE AND TEMPERANCE.

3RD TO 4TH CLASS. TIME 1½ HOURS.

Count 50 marks a full paper; 15 minimum to pass. LIMIT OF WORK.—Respiration, Circulation and Digestion.

1. (a) Where are the lungs situated?
(b) Describe their shape and internal construction.
(c) What are their uses?
(d) What are the benefits of good ventilation?
 2. (a) What are pores of the skin?
(b) What are their uses?
(c) What rules should be observed to maintain the skin in a healthy state?
 3. Write a short composition on "The Teeth." Refer to their
 - (a) Uses.
 - (b) Number.
 - (c) Time they endure.
 - (d) Means of their preservation and causes of decay.
 4. (a) Compare milk with alcohol as a beverage.
(b) What is the effect on the body of taking alcohol when a person feels very tired?
(c) How is the effect caused?
- VALUE—1—2, 6, 4, 6; 2—4, 4, 4; 3—12; 4—15.

Mathematics.

All communications intended for this department should be written on one side of the sheet only and should be addressed to the Editor, C. Clarkson, B.A., Seaforth, Ont.

THE HIGH SCHOOL SENIOR LEAVING AND UNIVERSITY HONOR MATRICULATION.—1893.

ALGEBRA.

1. (a) If $a+b+c+d=0$, show that $(bc-ad)(ca-bd)(ab-cd) = (b+c)^2(c+a)^2(a+b)^2$.

(b) If $2s = a+b+c$ and $2r^2 = a^2+b^2+c^2$, then $\frac{(r^2-a^2)(r^2-b^2)(r^2-c^2)+a^2b^2c^2}{r^2} = 4s(s-a)(s+b)(s-c)$.

(c) Show that the product of two integers, each of which is the sum of two square integers, is itself the sum of two square integers.

2. (a) Solve: $x^2(y+2)+y^2(x+2) = 56$, $xy = 6$.

(b) Show that if the equations $ax+hy+gz = 0$, $hx+by+fz = 0$, $gx+fy+cz = 0$

are consistent, then $ax^2+2hxy+by^2+2gx+2fy+c$ is divisible by a factor of the form $lx+my+n$.

3. (a) Find the sum of the first n terms of a geometric series, of which the first term is a , and the second term ra .

Deduce the sum of an infinite number of terms when $r < 1$.

(b) If the sum of n terms of a series be an^2+bn , show that the series forms an A. P.

4. (a) Find the number of combinations of n different letters taken r at a time.

In how many ways can 12 different things be divided into 4 groups of 3 things each?

(b) Find the number of combinations of n different letters, r at a time, when each letter may be repeated any number of times.

Find the number of terms in the expansion $(a+b+c+d^10)$, and the coefficient of $a^3b^3c^2d^2$.

(c) Find the sum of the squares of the first n natural numbers, in the form of an integral function of n .

Hence show that the sum of the squares of the first n odd numbers is equal to

$$\frac{n(2n-1)(2n+1)}{3}$$

5. (a) Prove the Binomial Theorem for positive integral indices.

Find the coefficient of x^{2m} in the expansion of $(x-\frac{1}{2x})^{2m}$, ($n > m$),

(b) If $c_0, c_1, c_2, \dots, c_n$, denote the coefficients in the expansion of $(1+x)^n$, show that $nc_1+(n-1)c_2+(n-2)c_3+\dots+2c_{n-1}+c_n = n2^{n-1}$.

Show that the coefficient of x^r in the expansion of $\frac{1+x}{1+x+x^2}$ is 0, if r is greater than a multiple of three by one.

6. (a) What sum invested now, at 5 per cent. per annum, compounded half yearly, will provide at the end of five years for a perpetual annuity of \$100? (Symbolic result.)

(b) A town owes \$10,000 on which it is paying 4 per cent. per annum, interest payable half-yearly, the principal to be paid at the end of 15 years. What sum of money deposited at the beginning of each year at 6 per cent. per annum, compounded half-yearly, will pay the interest and at the same time amount to a sufficient sum to pay the principal when due? (Symbolic Result.)

7. (a) The sides of a right-angled triangle

are in arithmetical progression: show that the least angle is $\sin^{-1} \frac{3}{5}$.

(b) Find the sum of n terms of the series $1^2.3+3^2.5+5^2.7+\dots$

8. (a) If $x-ay-az = y-bz-bx = z-cx-cy = 0$, prove that

$$x^2 : y^2 : z^2 :: \frac{1-bc}{bc} : \frac{1-ca}{ca} : \frac{1-ab}{ab}$$

(b) Eliminate x and y from the equations

$$\frac{x}{a} + \frac{y}{b} = 1, \frac{x^2}{c^2} + \frac{y^2}{d^2} = 1, xy = k^2.$$

SOLUTIONS.

1. (a) $a+b+c = -d$, multiply this by a, b, c respectively.

$\therefore a^2+ab+ca = -ad$; add bc to both sides, and $a^2+ab+bc+ca = (bc-ad) = (a+b)(c+a)$. By symmetry the two other factors are $(b+c)(a+b)$ and $(c+a)(b+c)$.

The product is therefore $(a+b)^2(b+c)^2(c+a)^2$, (b) $s-a = \frac{1}{2}(-a+b+c)$; $s-b = \frac{1}{2}(a-b+c)$; $s-c = \frac{1}{2}(a+b-c)$.

$\therefore 4s(s-a)(s-b)(s-c) = \frac{1}{4}(a+b+c)(-a+b+c)(a-b+c)(a+b-c) = -\frac{1}{4}(a^4+b^4+c^4-2a^2b^2-2b^2c^2-2c^2a^2) \dots A$.

Again N. of fraction $= r^6 - r^4(a^2+b^2+c^2) + r^2(a^2b^2+b^2c^2+c^2a^2)$; \therefore Fraction $= r^4 - r^2(2r^2) + a^2b^2+b^2c^2+c^2a^2 = a^2b^2+b^2c^2+c^2a^2 - r^4 = a^2b^2 + \text{etc.}, -\frac{1}{4}(a^2+b^2+c^2)^2 = -\frac{1}{4}(a^4+b^4+c^4 - 2a^2b^2 - 2b^2c^2 - 2c^2a^2) \dots B = A$, as required.

(c) Let 1st integer $= a^2+b^2$; 2nd c^2+d^2 ; their product is $a^2c^2+a^2d^2+b^2c^2+b^2d^2 = (ac+bd)^2+(ad-bc)^2$.

2. (a) $xy(x+y)+2(x^2+y^2) = 56 = 6(x+y)+2(x^2+y^2)$

$\therefore (x+y)^2+3(x+y)-40 = 0$; $x+y = 5$, or -8 $\therefore (x+y)^2 = 25$ or 64 ; $\therefore (x-y)^2 = 1$ or 40 . i.e., $x+y = 5$ or -8 ; $x-y = \pm 1$ or ± 40 , etc.

(b) Multiply 1st by x , 2nd by y , 3rd by z and add, and $ax^2+2hxy+by^2+2gxz+2fyz+cz^2 = 0$. But from 3rd $2gxz+2fyz+cz^2 = -cz^2$; also $2gx+2fy = -2cz$ $\therefore (ax^2+2hxy+by^2)+(2gx+2fy)+c \dots A = cz^2 - 2cz + c = c(z-1)^2$

pression, $z-1$ is a factor of A , the given expression. Hence

But $z = \frac{-gx+fy}{c} = \frac{-hx+by}{f} = \frac{-ax+hy}{g}$ $\therefore z-1 = \frac{fy-c}{c} = \frac{-hx-by-f}{f}$ $= -ax-hy-g$ $=$ generally, $lx+my+n$, the required divisor.

3. (a) Bookwork; $(ar^n - a) / (r-1)$; $a(1-r)$. (b) The sum of n terms of an A. P. is

$[2a+(n-1)d] \frac{n}{2} = \frac{1}{2}dn^2 + \frac{1}{2}n(2a-d)$, of which the general form is an^2+bn . Thus the form of the given expression shows that it is the sum of an A.P.

N.B.—Put $n=1, 2, 3$, etc., successively and we get sum of one term $= a+b$, of two terms $= 4a+2b$, of three terms $= 9a+3b$, etc. Subtracting these one by one we see that the supposed series must be $a+b, 3a+b, 5a+b$, etc.

4. (a) Bookwork; $n(n-1)(n-2) \dots (n-r+1) / [r | 12 | 4 | 3 | 3 | 3 | 3]$, the groups being undistinguished.

(b) Bookwork; $[n+r-1 | r | n-1; 11. 12. 13 | 3; / | 10 | 2 | 2 | 3 | 3 = 25200$.

REMARK.—The last part of (b) does not fairly come within the limits assigned by the official programme. Of course, it is possible to solve it by the binomial theorem, but it is properly a question on the multinomial theorem. To solve it as follows would seem rather ridiculous:

$$[(a+b) + (c+d)]^{10} = (a+b)^{10} + 10(a+b)^9(c+d) + 45(a+b)^8(c+d)^2 + 120(a+b)^7(c+d)^3 + 210(a+b)^6(c+d)^4 + \text{etc.}$$

Now a^3b^3 cannot occur except as the middle term of $(a+b)^6$, and c^2d^2 cannot occur except as the middle term of $(c+d)^4$. Expanding these we get 210 (20×6) as the coefficient of $a^3b^3c^2d^2$.

$$(c) 1, 4, 9, 16, \dots \therefore \text{Sum} = \frac{3n(n-1)}{2} + \frac{2n(n-1)(n-2)}{3} = \frac{n}{6}(n+1)(2n+1)$$

$$1, 9, 25, 49, \dots \therefore \text{Sum} = \frac{8n(n-1)}{2} + \frac{8n(n-1)(n-2)}{3} = \frac{n}{3}(4n^2-1)$$

(To be Continued.)

PROMOTION EXAMINATIONS.

At the request of several correspondents we submit the following papers as suitable tests for pupils who propose to try the County promotion examinations:

ENTRANCE TO SENIOR THIRD CLASS.

ARITHMETIC.

1. A miller sold 7,540 lbs. of flour at \$3.50 per 100 lbs.; how much money did he receive?
2. What number must be taken 1416 times from 1377906, to leave 138 for remainder?
3. How many 4 oz. weights can be made out of 3 cwt., 3 qrs., 3 lbs. of brass?
4. What would it cost to ditch a road a quarter of a mile long on each side, at the rate of 40 cts. per rod?
5. How many cubic feet in 9000 bricks, each 2 inches thick by 4 inches wide and 8 inches long?
6. If a man can make 20 buttons in a minute, how many days of 10 hours each will he be in making 2844000 buttons?
7. If I buy 80 turkeys at the rate of 5 for \$4 and sell them at the rate of 8 for \$9, how much do I gain?
8. Divide (75890134263 — 89649327) by the sum of 47, 36, 823, 64, 439, 88, 75, 751, 157, 98, 899, 75, 946, 437, 258, 346, 218, 516, 432, 814.
9. There are 67440 acres in one township and 45880 in another, how many square miles in the two townships together?
10. Multiply 172814412 and 978613245 together by three lines of partial products, or in any way you like?

ENTRANCE TO FOURTH CLASS.

1. A farmer bought 120 ac., 3 r., 20 sq. per. from one man, and 76 ac., 34 sq. per. from another man, and then sold to a neighbor 56 ac., 3 r., 20 sq. yds. How many acres has he remaining?
2. How many yards of cloth worth 5 shillings per yard can be bought for £40, 10s., 6d.?
3. A man built 2 miles 1 fur. 15 rds. of fence for \$76.45. How much a rod did he get?
4. Find the sum of $7\frac{1}{2}, 8\frac{2}{3}, 14\frac{1}{2}, 9\frac{1}{5}, \frac{3}{8}, \frac{5}{15}$.
5. If \$402 be paid for 12 ac., 2 r., 10 per., how much will 1 ac. cost?
6. Bought $2\frac{1}{2}$ of $\frac{1}{5}$ of $\frac{1}{3}$ of bush. 1 pk., 1 qt. for \$51.92 and sold 12 bush., 2 pk., 1 gal. for \$20.20. How much was gained on each bushel sold?
7. Find the value of $3\frac{3}{4} + \frac{1}{2}$ of $2\frac{1}{2} + 8\frac{5}{16} + \frac{7}{12} - \frac{3}{4}$ of $\frac{5}{12}$.
8. A man bought a horse for \$110 $\frac{3}{4}$, which was \$12 $\frac{5}{8}$ more than he gave for him. Allowing

\$5 $\frac{1}{4}$ for his keep while he owned him, how much did he gain by the transaction?

9. If a man's income is £400 a year, how much can he spend on an average each day and still save £50, 10s., 4d. in the year.

10. Find the G.C.M. of 460, 1035, 1150.

ENTRANCE TO FIFTH CLASS.

1. How many lots containing 1 rood, 17 perches, 3 yards can be surveyed out of 100 acres of land.

Divide $\frac{3\frac{1}{8}}$ of $\frac{12-3\frac{1}{8}}{3}$ by .036, giving the quotient as a decimal.

3. Express the time which elapsed between 5 p.m. on the 3rd of January last and 11 a.m. March 25th, as a decimal of a year (365 days.)

4. If it require 4,900 yards of cloth $1\frac{3}{8}$ yards wide to clothe 2,900 soldiers, how many yards of cloth $\frac{3}{4}$ yard wide will suffice for 6,000 soldiers?

5. What is the value of 5 tons, 3 cwt., 17 lbs. of barley, and 3 tons, 1 cwt., 13 lbs. of wheat, the barley being worth 75c. per bushel and the wheat $1\frac{1}{2}$ times as much per bushel as the barley?

6. The water in a cistern 4 feet deep, 5 feet long and 3 feet wide weighs 3,750 lbs. A gallon of water weighs 10 lbs; how many cubic inches in a gallon?

7. What is the value of 21 acres, 3 roods, 13 perches of land, at \$67.75 per acre?

8. I gain \$2.50 by selling 5 bushels of clover seed at the rate of 61 $\frac{1}{2}$ c. for 5 quarts; what did it cost me per bushel?

9. Express .75 of £16, 12s., 8d. as a decimal of £14, 17s., 6d.

10. A can do a piece of work in $\frac{5}{8}$ of a day; B in $\frac{7}{8}$ of a day, and B and C together in $\frac{3}{4}$ of a day. In what time would A and C together do it?

ENTRANCE TO SIXTH CLASS.

1. Bought Bank of Montreal stock at 186. If an annual dividend of 8% is declared what rate of interest do I receive on my investment.

2. For how much must I draw a note for 8 months on which I can raise at a bank \$4,660.50; rate of discount being 7%?

3. What amount of stock in a company at 10 $\frac{1}{2}$ % below par could be bought for \$1,342.50?

4. Dominion Government stock 5% is quoted at 107, and the City of Toronto 6% at 110. Which would be the better investment, and what would be the difference in the annual income from \$200 invested in each?

5. A rectangular field whose length is four times its breadth contains 10 acres; find its perimeter.

6. What will \$280 amount to in 3 $\frac{1}{2}$ years at%, compound interest?

7. Find the value of .00185 \times .07 \div 3.024.

8. How many times larger is a spherical ball 4 inches in diameter than one 3 inches in diameter?

9. If it cost £15 15s. to make a cubical cistern, open at the top, with lead, at 1s. 9d. per sq. foot, inside measurement, how many gallons will the cistern hold? (The Imperial gallon contains 277274 cub. in.)

10. If A's income be 150% more than B's, how much per cent. is B's income less than A's?

LONG MULTIPLICATION WORKED WITH A SINGLE LINE OF FIGURES.

Suppose we wish to multiply 56248 by 3726. We set the sum up in the usual way, thus:

We then write out the upper line, backwards, on the lower edge of a separate slip of paper, placing a mark over the unit-digit, as a guide to the eye; with this slip we cover the upper line of the given sum, bringing the marked digit over the unit of the lower line, thus:

We then take the product of the digits which are in the same vertical line (viz., 8, 6); this gives us 48; we write the unit of this (viz., 8) vertically under the scored digit, and "carry" the 4, thus:

$$\begin{array}{r} 84265 \\ 3726 \\ \hline 8 \end{array}$$

We then shift the slip one place to the left, thus:

$$\begin{array}{r} 84265 \\ 3726 \\ \hline 8 \end{array}$$

We then add together the carried digit and the products of the digits which are in the same vertical lines, and write the result as before. The mental process being, "4+24=28, +16=44; set down 4 and carry 4."

We then shift the slip again, and proceed as before; the mental process being, "4+12=16; +8=24; +56=80; set down 0 and carry 8."

$$\begin{array}{r} 84265 \\ 3726 \\ \hline 48 \end{array}$$

We then shift the slip again, and so on; the last step being reached when the sum stands thus, with 5 to carry:

$$\begin{array}{r} 84265 \\ 3726 \\ \hline 048 \end{array}$$

Hence the mental process of the last step is "5+15=20; set it down." We then remove the slip, and the result appears thus:

$$\begin{array}{r} 84265 \\ 3726 \\ \hline 580048 \end{array}$$

A similar method will serve for multiplying decimals; all we have to remember is, to bring the marked digit of the slip vertically over whatsoever decimal place we wish to carry the working to. For example, if we wish to multiply together .63624 and .25873, and if, in order to have the answer correct to three places, we wish to carry the working to four places, we set the example thus:

$$\begin{array}{r} 580048 \\ 56248 \\ \hline 3726 \\ \hline 209580048 \end{array}$$

We then write 426360 on a separate slip of paper, and place it so that its marked digit comes vertically over the 4th decimal place in the answer, thus:

$$\begin{array}{r} 0.63624 \\ 0.25873 \\ \hline 0.25873 \end{array}$$

The mental process of the first step will be, "0+48=48; +15=63; +12=75; set down 5 and carry 7."

$$\begin{array}{r} 42.6360 \\ 0.25873 \\ \hline 5 \end{array}$$

We then shift the slip to the left and proceed as before, the last step being reached when the sum stands thus, with 1 to carry:—

$$\begin{array}{r} 42.6360 \\ 0.25873 \\ \hline 635 \end{array}$$

Hence the mental process of the last step is "1+0=1; set it down." We then remove the slip, and the result appears thus:—

$$\begin{array}{r} 0.57624 \\ 0.25873 \\ \hline 0.25873 \end{array}$$

Hence the answer, correct to 3 places, will be .164.

$$\begin{array}{r} 0.57624 \\ 0.25873 \\ \hline .1635 \end{array}$$

This method seems to me not only to save space and time, but also to avoid the risk of mistakes involved in writing all the intermediate lines of figures required in the old method, as well as the constant risk of losing one's place while carrying the eye obliquely from one figure to another figure several rows above it.

CHARLES L. DOBSON,

Senior Student and Mathematical Lecturer of Christ Church, Oxford.

—Educational Times.

REMARKS.

1. The *Public School Euclid and Algebra* which has just been issued covers only 26 propositions of Bk. I. and simple equations of one unknown. The consequence is that in many schools the teacher will be compelled to use a different set of books for the advanced class which is going over the *Primary* course, and the pupils who pass the *Public School Leaving* examination will find the book of no use in their further studies. The cheaper and more satisfactory plan is to get the whole of Bk. 1, as may be done for the same price, and use an introductory algebra that will cover the *Primary* work. In this way the two classes can be worked together to a certain extent and the saving of time and energy

will be considerable. In an ungraded school the multiplication of classes means the division of teaching power and the subtraction of effective work. It will stimulate any *Public School L.* class to associate as far as possible with the senior class and to keep pace with them as far as the juniors are able.

2. Under present auspices there is a manifest tendency to place more and more new subjects on the public school programme, already too crowded. Mr. W. J. Robertson has pointed out in the public press the result of this as seen in the lowering of the standard in mathematics below the *Junior Leaving* examination.

CORRESPONDENCE.

The following problems have been sent by various correspondents who would be grateful to see solutions in the columns of the JOURNAL.

No. 23. Question 5, paper I, p. 215, H. Smith's Arith.

No. 24. Question 2, paper II, p. 216, H. Smith's Arith.

No. 25. Question 8, Exercise 35, p. 102, Pub. Sch. Arith.

No. 26. Question 21, p. 95, Pub. Sch. Arith.

No. 27. Question 24, p. 95, Pub. Sch. Arith.

No. 28. What is the fractional unit? What the prime unit in $\frac{3}{4}$ of an ounce? $\frac{4}{5}$ of an inch?

No. 29. "What is the best way of finding the number of feet board measure, in 8 boards, 19 feet long, 16 inches wide and 2 $\frac{1}{2}$ inches thick?"

No. 30. What rate of interest is equivalent to 10% discount, the term of discount being 95 days?

C. A. B., sends the following note regarding No. 68 (1893):—

50 yds. cloth for \$7.62, part at 13c and part at 18c per yard, etc.

It appears to me the solutions and explanations given are cumbrous and lengthy.

I think the following better and more easily understood by pupils. If he bought all at 18c the cost would be:

$$\begin{array}{l} 50 \times 18c = \$9.00 \\ \text{He did pay } 7.62 \end{array}$$

He saved by buying some at 13c \$1.38
Now every time he buys a yard at 13c he saves 5c.

$$\begin{array}{l} \text{He buys } 1\frac{2}{3} = 27\frac{2}{3} \text{ yds. at } 13c. \\ \quad \quad \quad 22\frac{1}{2} \text{ yds. at } 18c. \end{array}$$

Looking backward at the generous assistance freely given last month by an army of correspondents the EDITOR has confidence in requesting assistance for the teachers who find difficulties with the solution of these questions. Strictly speaking, they have put themselves beyond the pale by neglecting to give the problems as well as the references; but they are fellow teachers and will doubtless remember the rule next time. One of them pays the JOURNAL the following "downy" compliment;—"Have been taking the EDUCATIONAL JOURNAL for years. To me it is the goose that lays the golden eggs." Dear gosling, his heart is all right, and he will, no doubt, do his best to keep the old goose laying valuable eggs as long as possible!

J. F. L., states that our interpretation of the famous No. 68 as he solved it, was in accordance with the meaning he intended.

We have received a few solutions of the problems, No. 1 to 21, given in the January issue. We would like to publish selected solutions of all on April 1st.

THE public school teacher should realize that the will requires training as well as the intellect, and every true teacher will find the days full of opportunities for training the children up into ways of fair dealing and right living—into habits of virtue that will cling to them all their lives.—Supt. H. M. James.

Primary Department.

READING.

RHODA LEE.

V.

If, as we have said before, our language were perfect, we should have but one letter to represent such sounds as are indicated by *ch, ng, ou*, etc. As it is, we have a number of clumsy combinations, some of which we shall doubtless dispense with when the spelling reformers have accomplished their work, but as the day for this has not yet come we cannot ignore the difficulties. In a previous paper we indicated methods of introducing some of these combinations and it is our object to-day to discuss briefly those remaining. No difficulty will be experienced with the writing as the children have used all the letters in previous lessons.

1.-*ng*. A simple, continuous voice sound as in *ring, song, clung*, etc.

2.-*nk*. The sound produced by these letters is equivalent to *ngc* as in *ink, thank, shrunk*, etc.

3.-*oa* and *ow* have the sound of long *o* as in *boat, throat, grow* and *snow*. As *ow* has sometimes the sound of *ou* as in *now, town*, etc., we distinguish the long sound by marking it as follows, *snōw, thrōw*. (These markings should only be used at first. Do not cripple the child by using them any longer than is absolutely necessary).

4.-*wh* is equivalent to *hoo* as in *whip, whisk, whisper*, etc.

Note—Comparing this sound with that made by the *owl* will impress it and add interest to the lesson.

5.-*qu*. This sound may be represented by *coo*. We call it the *pigeon* sound. Words—*queen, queer, quaint, quilt, quiver, quickly*, etc.

6.-*ph*. These two letters have the sound of *if* as in *Ralph, photograph, graphic, phonograph, Philadelphia, diphthong*, etc.

7.-*au* and *aw* usually give merely the broad sound of *â*, which may be taught in connection with these combinations.

Broad *â*,—*want, water, wasp, call, tall, talk*, etc.

Au,—*haul, freight, naught, taught*. But when the letters *au* are followed by *n* and another consonant, they often take the sound of *a* in *far, farther*, etc., as, for example, in *haunt, taunt, aunt, laugh*, etc.

Aw,—*paw, saw, straw, claw*, etc.

8.-*tion* and *sion* are equivalent to *shun*, as seen in the words *convention, collection, pension, mansion, conversion*, etc.

Peculiarities such as soft *c* and *g*, silent *gh, b, w, l*, and *k* should be definitely taken up in turn, and it is well to keep lists of these and other *unphonetic* words on the blackboard until the children become familiar with them.

Soft *c*;—*nice, place, cinnamon, city*, etc.

Soft *g*;—*edge, margin, gentleman, gesture*, etc.

Silent *k*;—*knit, knows*.

Silent *l*;—*half, calf, walk*.

Silent *w*;—*write, wrong, wrist*.

Silent *b*;—*limb, lamb, climb*.

Silent *gh*;—*right, light, taught, fright*.

The words given above are samples

merely. Collect as many words as you can containing the sound to be taught and vary the sight reading as much as possible. Do not give the same word twice in a lesson if you can find another to take its place, for every new word recognized means so much added power to the child.

BUSY WORK IN GEOGRAPHY.

RHODA LEE.

Interesting and profitable busy-work in geography may be given by asking the children to make lists of the animals, birds, vegetables, etc., found in the country in which they live. The lists that may be thus formed are so numerous, it might be well to mention those most suitable for work in the junior classes.

1. Birds found summer and winter in the neighborhood.

2. Animals, domestic or otherwise, belonging to the country.

3. Fish.

4. Trees growing in the vicinity of their homes.

5. Fruit, vegetables and grains grown in the neighborhood.

6. Productions and manufactures, giving when possible their uses.

7. Exports and imports.

Make each one of these subjects a topic for a week or more and encourage the children to find out everything they can concerning it. In making the lists it is well to form from the individual ones a general statement containing the result of the work of the class. This may be kept on file for future use.

While speaking of busy work of this nature I am reminded of a very material aid in teaching primary geography that I most strongly recommend, namely, a collection of geographical pictures. It can very easily be made as the children will do most of the collecting. As each physical feature is in turn studied ask the children to be on the lookout for pictures of the mountain, volcano, island, or whatever it may be. We often see them in Sunday School or other illustrated papers, business cards, etc. Do not put the pictures in a book but paste them on cardboard that they may be easily distributed to the children. These pictures will be found useful in a great many ways, particularly in drawing out original geographical stories and in illustrating those you may relate.

STORIES FOR COMPOSITION

"HONEST JOHN MAYNARD."

THE American paddle-ship was only a few miles from the shores of the lake. John Maynard stood at the helm.

"Fire! fire!" whispered one of the crew; for there from the hold dark smoke was pouring forth.

"Go down and report!" commanded the captain to one of the crew.

"Hold's on fire, sir," was the answer, as the sailor came back to deck.

For a moment all was confusion. The passengers, frightened, clung to each other in wild despair.

"How is her head?" shouted the captain to the pilot.

"West—sou'-west, sir," rang back John Maynard's brave reply.

"Keep her so," the captain shouted again. "We must make the nearest landing."

"Aye, aye, sir!" answered the pilot cheerily.

And now the engineer put on steam; the passengers were ordered to the prow; water was poured on the sails. On, on, sped the vessel,—twenty knots an hour.

In the very midst of the smoke and flame stood the pilot. Hardly could he see the land ahead. The smoke was suffocating! The flames were upon him! The engineers fled from the engine-room! Every man and woman was hurrying to prepare for the struggle for life so sure to follow.

Now the shore was only a mile away! The outline was distinct! Boats were pushing out to meet them.

"Hold on five minutes longer, John!" cried the captain.

"By God's help I'll try, sir!" came back the muffled answer from the flames and smoke.

The flames now seized him; stung with the pain, he only grasped more tightly. His face grew deathly pale!

The boats had reached the ship.

"The women and children first!" cried the captain.

These were the last words that ever reached John Maynard's ear. The ship's keel grated upon the sand! The men leaped out. Passengers, sailors and captain—all were saved. All but honest John Maynard, the brave pilot whose firm courage and steady hand had held the helm, and had guided the vessel safely into port.

[The following story is suggestive for an object lesson on *buttons*.—R. L.]

BUTTONS.

"BUTTON, button, who has the button?" asked a glove that had been dropped on the toilet-table.

"I've got it," answered Jimmy's jacket. "I've several buttons in fact."

"No," put in the closet door, "I have it myself; the carpenter gave it to me."

"I had a dozen or so," said a boot, looking down at the heel.

"And I have a hundred or more," yawned the easy chair, "but they don't button anything; they don't belong to the working-class."

"Here's a bachelor's button," remarked a vase of flowers on the bureau.

"There's a button-wood tree in the garden," said the button hooker. "I suppose you all grew there."

"I know better than that," pouted the closet door. "Mine grew in the veins of the earth, where all the precious metals are found. It's a poor relation of theirs." "And we," added a pair of ivory sleeve buttons, "we grew in the land of the white elephant. We were carved from the tusks of the leader who threaded the jungles and swam the rivers at the head of the troops." "My buttons," said the glove, "were nearly related to the gem which Cleopatra dissolved for Antony. They were mother-of-pearl, grown in the shell of the pearl

oyster, for which divers risk their lives."
 "That's something of a fish story," thought Jimmy's jacket. "My buttons are only glass, but glass is sometimes made of sand, and who knows but what their atoms may have been swept down to the seashore from 'Farthest India?'"

"And I," whispered the bachelor's button, "I sprang up from a tiny seed, with all my splendor of blue and purple wings, like the Afrite from the jar which the fisherman found on the beach. It is a miracle how I was packed away there!"—*Mary N. Prescott.*

LANGUAGE EXERCISES

I. Write the following questions with answers in full:—

1. What is your name?
2. Where do you live?
3. How old are you?
4. What school do you attend?
5. Who is your teacher?
6. What have you learnt this week?

II. Fill up the blanks in the following and where possible make two or more statements:—

- | | |
|--------------|----------------|
| A dozen of — | A pound of — |
| A peck of — | A quart of — |
| A yard of — | A pair of — |
| A bag of — | A package of — |
| A bunch of — | A can of — |
| A cake of — | A barrel of — |
| A load of — | A ton of — |
| A box of — | |

THE BOY HIAWATHA.

THEN the little Hiawatha
 Learned of every bird its language,
 Learned their names and all their secrets,
 How they built their nests in summer,
 Where they hid themselves in winter;
 Talked with them when'er he met them,
 Called them Hiawatha's chickens.
 Of all beasts he learned the language,
 Learned their names and all their secrets,
 How the beavers built their lodges,
 Where the squirrels hid their acorns,
 How the reindeer ran so swiftly,
 Why the rabbit was so timid;
 Talked with them when'er he met them,
 Called them Hiawatha's brothers.
 Then Iagoo, the great boaster,
 He, the marvellous story-teller,
 He, the traveller and the talker,
 He, the friend of old Nokomis,
 Made a bow for Hiawatha;
 From a branch of ash he made it,
 From an oak-bough made the arrows,
 Tipped with flint and winged with feathers,
 And the cord he made of deerskin.
 Then he said to Hiawatha,
 "Go, my son, into the forest,
 Where the red deer herd together,
 Kill for us a famous roebuck,
 Kill for us a deer with antlers!"
 Forth into the forest straightway,
 All alone walked Hiawatha.
 Proudly, with his bow and arrows.
 And the birds sang round him, o'er him,
 "Do not shoot us, Hiawatha!"
 Sang the robin, the Opechee,
 Sang the bluebird, the Owaisa,
 "Do not shoot us, Hiawatha!"
 Up the oak tree, close beside him,
 Sprang the squirrel, Adjidaumo,
 In and out among the branches,
 Coughed and chattered from the oak tree,
 Laughed, and said between his laughing,
 "Do not shoot me, Hiawatha!"
 And the rabbit from his pathway
 Leaped aside, and, at a distance,
 Sat erect upon his haunches,
 Half in fear and half in frolic,
 Saying to the little hunter,
 "Do not shoot me, Hiawatha!"
 —*Longfellow.*

CLASS RECITATION.

A BEAR STORY.

I went away to the woods one day,
 With my gun and Fritz my hound;
 I wandered here and I wandered there,
 But never a bear I found.

I was lying down to rest awhile,
 In a grassy, shady glade,
 When I saw six bears come up in pairs;
 What a terrible noise they made!

One crunched his jaws and with legs and paws,
 Gave me a hug and a squeeze,
 Another one tried to nurse old Fritz,
 Who struggled upon his knees.

One waddled off with my new felt hat
 And tumbled it outside in,
 And two looked on, how I wished them gone!
 For they did so smile and grin.

I tried to rise, when before my eyes,
 Stood a big bear fierce to see,
 Holding my gun in his crooked claws
 And pointing it straight at me.

He pulled the trigger, I heard it click;
 I saw the flash and smoke,
 And then with a shriek—I could not speak—
 From my terrible dream, I awoke.

—*Anon.*

SIGNS OF SPRING.

BY JAMES BUCKHAM.

SOUND of gusty driving rain
 When we wake at midnight hour,
 Ice-tipped branches on the pane
 Beating music to the show'r.

Crows that caw from steaming woods,
 Robins piping in the glades,
 Buds that from their winter hoods
 Peep and blush like pretty maids.

Grateful odors of damp earth,
 Boist'rous glee of muddy rills,
 Shouting, brawling in their mirth,
 Down the bare flanks of the hills.

Here and there a crocus' head
 Thrusting up to dare the cold,
 While its sisters, warm in bed,
 Stir their coverlids of mold.

Spring is coming; spring is near;
 She is whispered in the air,
 Soon the blithe nymph will be here,
 Shaking blossoms from her hair.
 —*Harper's Bazaar.*

Book Notices, etc.

Any book here reviewed sent post-paid on receipt of price. Address THE EDUCATIONAL JOURNAL, Toronto.

Inorganic Chemistry for Beginners. Roscoe & Lunt. MacMillan & Co., Publishers.

Much of the matter contained in the Lessons in Elementary Chemistry has been re-written for this edition. The general principles of Chemistry, so far as can be understood by the beginner, have received more attention while the descriptive portion has been largely curtailed. As a supplement to any good course in practical laboratory work, the young student will find it of great assistance.

**

Elementary Science and Physiology.

The object of this book is to show Elementary Science can be taught as an auxiliary to Physiology and Hygiene. The author at considerable length outlines a few lessons to indicate the method of using the text book. It is difficult to see the connection in many cases between the phenomena illustrated by certain experiments in Physics and Chemistry, and their physiological significance. The book is, however, suggestive, and the author's aim at least rational. Published by the author H. DORNER, Ph. D., Principal of the Milwaukee Public Schools.

School-Room Methods.

TEACHING OF ENGLISH COMPOSITION.

THE following by Mr. Ernest W. Huffcut, which appeared some years ago in *The Canada School Journal*, is worth reproducing:

As teachers have more trouble in selecting subjects than in any other duty connected with this work, it may not be out of place to consider briefly the precise nature of a good subject for an elementary class. In order to make the remarks on this point more intelligible, it will be necessary to remind the reader that all prose composition may be divided into four kinds:

1. Narration, or the relating in language of some incident or series of incidents.
2. Description, or the picturing in language of some natural object, or the characteristics of some natural object.
3. Exposition, or the defining, explaining and illustrating of some general notion or abstract idea.
4. Argumentation, or the establishing of the truth or falsehood of some proposition.

Now, of these four kinds of prose composition, that known as exposition is by far the most difficult, and calls for the exercise of careful thought and of trained discipline in the choice and collocation of words. It is under this class that the extensive branch of knowledge known as metaphysics is included. Yet exposition is the very class under which fall the great majority of the subjects chosen for essays in the elementary schools. Of the five hundred and sixty-six subjects given by Dr. Quackenbos, over four hundred are expository subjects, while those which are subjects of narration are broad enough to call for a large volume,—such, for instance, as Ancient and Modern Greece. The Reign of the Emperor Nero, and The Era of Haroun Al Raschid.

The easiest class of subjects is that embraced under narration. The child begins to talk in narrative (as, for instance, when he gives an account of how he went out on the road and made mud pies). It is an easy and natural form of composition. Hence it follows that in the lower classes the subjects should be those of narration. Ask the pupil to tell the incidents of his morning walk to school, the incidents connected with the ball game of yesterday, the incidents of a fishing excursion, or any one of the events of his daily life. It will be found that he has something to say, and will say it in an easy and natural style. For many reasons it seems best to persist in this style of composition throughout all the grades of our common schools. The subjects can, of course, be adapted to the increasing knowledge of the student; and description, exposition and argumentation can be introduced as incidental to the narrative.

Perhaps, after the simplest and commonest experiences of every day life, the easiest subjects are those adapted from some interesting story or poem. Paraphrase and metaphrase should easily form a part of the work in composition. Take, for instance, a chapter from "Robinson Crusoe," or from one of Miss Alcott's or Mrs. Whitney's books, and let the pupil tell the same incidents in his own way, carefully avoiding the language of the author. With somewhat advanced classes this kind of work may be made profitable in more ways than one. Fiction, history, biography, travels, may all be made to contribute to the usefulness and interest of the work.

To illustrate: Suppose the teacher puts into the hands of a bright pupil Motley's masterly account of the Siege of Leyden, and asks him to relate the same incidents in his own language and with somewhat less of detail. What is the result? The boy becomes intensely interested in the story; learns, perhaps for the first time, that history is more fascinating than fiction; is eager to reproduce the story, and does so with good and useful results. Nor is this all. He has probably dipped into other portions of the

story of the "Dutch Republic," and is eager to paraphrase some other interesting chapter.

Now, how does this differ from the old methods? Dr. Quackenbos would, doubtless, have assigned as a subject, "The Dutch Republic," or possibly, "William the Silent." The boy would have gathered a few encyclopædic facts, strung them together in a hurried and unnatural style, and then gladly dismissed the whole matter from his mind.

Take another example: Suppose that, instead of giving the subject "Tennyson's Poetry," the teacher ask a class of bright girls to make a metaphor of "The Princess." The result will be, that the girls will read one poem of Tennyson's instead of reading some article about Tennyson, will invariably be charmed by the poem, and will tell the story in natural and wholesome prose.

Let the same plan be pursued with other authors, and the teacher will soon find that he is no longer vexed with the sighs and complaints of his composition class. There need be no limit to this kind of work for want of material. The short stories of Hawthorne furnish excellent material. Lowell's "Vision of Sir Launfal" cannot fail to delight and interest an advanced class. The story of young Marlow in "She Stoops to Conquer," or of Portia in "The Merchant of Venice," or of Evangeline, or of Miles Standish, will be certain to arouse enthusiasm.

WRITTEN EXERCISES.

I. WRITE sentences containing the plurals of the following nouns:—

shoe,	valley,	chimney,	half,
eye,	leaf,	muff,	tooth,
hedge,	city,	mystery,	lily,
thief,	safe,	mouse,	army,
handkerchief,	tax,	pulley,	Marcy.

II. Write sentences containing the plural forms of the following:

piano,	motto,	potato,	solo.
hero,	negro,	buffalo,	echo.
portfolio,	mosquito,	lasso,	volcano.

III. Use the plural forms of these nouns in sentences:

vice-president,	mouthful,	sister-in-law,
merchantman,	man-of-war,	mother-in-law,
Mr. Hale,	Miss Sand,	forget-me-not,
tooth-brush,	cupful,	pailful.

IV. Use the following nouns in sentences, with plural adjectives or verbs:

scissors,	shears,	measles,	ashes
eaves,	mumps,	tongs,	spectacles,
trousers,	oats,	wages,	pincers.

Ex.: These scissors are dull.—*Hyde's Practical Lessons in the Use of English.*

THE TEACHER.

WHEN I was about to take up the duties of a teacher for the first time, a teacher by nature and experience said to me: "Don't get bossy." At the time I did not see the significance of the advice and almost thought it uncalled for. After having taught for one year I became conscious of the fact that I was fast becoming a "schoolma'am," in all that word, in modern usage, implies. I was each term becoming more domineering and less gentle.

Just to-day I asked a little girl who her teacher was, she replied, "Miss L—. I like her, she is not cross." She spoke as if it was a very unusual thing for a teacher not to be cross.

Is this true? If so the pupils are to be pitied, but much more so the teacher; but has she not twenty things a day to make her so? True, every teacher has at times reasons for righteous indignation, but crossness is a fault which never leans to virtue's side. Do I as a teacher never become cross? Much to my dismay and disgust of self, I do; but

"We may rise on stepping stones
Of our dead selves, to better things."

How can a young woman teach in a public school and maintain a gentle and lovable disposition? How can she be free from that which pupils with so much aversion term "crossness"? In the first place she can bear in mind that smiles are powerful and that it is neither criminal nor a waste of "sweetness on the desert air" to smile in the school-room. We are almost certain to receive impressions from anything on which we allow our thoughts or words to dwell. Let the teacher then dwell on the pleasant things which occur every day.

Do pleasant things occur every day in the school-room? Oh yes, if we open our eyes wide enough to see them and our hearts to appreciate them. "We are apt to view our troubles with both eyes and our blessings with only one."

The Bible tells us to think on "Whatsoever things are pure, lovely and of good report." Teachers who have tried, and apparently in vain, to appeal to the nobler nature of their pupils, have been led to exclaim, "They have not a nobler nature." But let us "be noble, and the nobleness which in other men lies sleeping, but never dead, will rise in majesty to meet our own."—*Educational Review.*

For Friday Afternoon.

SKATING SONG.

BY HARCOURT.

THE evening is cold but the moon shines forth,
And the icy breath of the wind from the north
With crystal fetters the stream has bound,
And silenced the rapid's rippling sound.

Merrily gliding to and fro
Ever along the stream;
Over the glittering ice we go
Till skating seems a dream.

Along the bank are the sable pines,
And through their branches the cold moon shines,
As under their shadows, or out in the light,
Our voices ring forth on the silent night.

Over the river, as fleet as the hare,
We burst our way through the frosty air,
With sounding steel on the river's breast;
Our heart's rebound with a joyous zest.

As the moon sinks down behind the trees,
And the tall pines moan in the northern breeze,
Of the fallen branches a pile we raise,
And laugh in the light of our bon-fire's blaze.

While 'round our fire's reflection warm,
Ah! little we heed the rising storm,
As the fairies and elfs go hurrying past,
On the sweeping wings of the midnight blast.

The smoke ascends to the star-lit sky;
Then home o'er the ice-bound stream we fly,
And we hurry the speeding hours along
With a merry laugh and a skating song.

The winter night is waning fast
And the snow has driven us home at last;
But oft at night as we sleep and dream,
Again we skate on that frozen stream.

A WATCHWARD FOR THE NEW YEAR.

WHEN you find a certain lack
In the stiffness of your back
At a threatened fierce attack,
Just the hour
That you need your every power,
Look a bit
For a thought to baffle it.
Just recall that every knave,
Every coward, can be brave
Till the time
That his courage should be prime—
Then 't is fled.
Keep your head!
What a folly 't is to lose it
Just the time you want to use it!

When the ghost of some old shirk
Comes to plague you, and to lurk
In your study or your work,
Here 's a hit
Like enough will settle it.
Knowledge is a worthy prize;

Knowledge comes to him who tries—
Whose endeavor
Ceases never.
Everybody would be wise
As his neighbor,
Were it not that they who labor
For the trophy creep, creep, creep,
While the others lag or sleep;
And the sun comes up some day
To behold one on his way
Past the goal
Which the soul
Of another has desired.
But whose motto was, "I'm tired."

When the task of keeping guard
Of your heart—
Keeping weary watch and ward
Of the part
You are called upon to play
Every day—
Is becoming dry and hard,—
Conscience languid, virtue irksome,
Good behaviour growing *worksome*,—
Think this thought:
Doubtless everybody could,
Doubtless everybody would,
Be superlatively good,
Were it not
That it's harder keeping straight
Than it is to deviate;
And to keep the way of right
You must have the pluck to *fight*.

St. Nicholas for January.

IF I WERE YOU.

UPON my word,
Miss Yellowbird,
If I were you and you were I,
I wouldn't be so drefle shy,
And up and fly
When you came nigh!

If I were you,
I tell you true,
Old busy, buzzy, bumblebee,
I wouldn't sting
For anything,
A little bit o' girl like me!

O, how you cluck,
You naughty duck,
No, quack, I mean—but all the same,
I wouldn't ever have the name
Of making such a great ado,
If I were you!
Now shoo! shoo! shoo!

If I were you,
Old pussy mew,
I think, you look so warm and snug,
That I would come—
Like you—O—hum!
And just curl up here on the rug!

C. C. Jencks.

THE BOY FOR ME.

His cap is old, but his hair is gold,
And his face as clear as the sky:
And whoever he meets, on lane or streets,
He looks him straight in the eye,
With a fearless pride that has naught to hide.
Though he bows like a little knight,
Quite debonair, to a lady fair,
With a smile that is swift as light.

Does his mother call? Not kite or ball,
Or the prettiest game can stay
His eager feet, as he hastens to greet
Whatever she means to say;
And his teachers depend on the little friend,
At school at his place at nine,
With his lessons learned and his good marks
earned,
All ready to toe the line.

I wonder if you have seen him, too.
This boy who is not too big
For a morning kiss from his mother and sis;
Who isn't a bit of a prig,
But gentle and strong, the whole day long
As merry as a boy can be.
A gentleman, dears, in coming years,
And at present the boy for me.

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THERE is no kind of sermon so effective as the example of a great man.—Blackie.

GOD'S sequence for our moral growth is feeling, thought, decision, and action. The first three steps without the fourth are useless. Every time a boy takes the first two steps without proceeding further, he strengthens the habit of neglect of duty.—Hughes.

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