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THE
SCHOOL MAGAZINE.

HEALTH DEPARTMENT.

Editor : A. Hamilton, M. A., M. D., Port Hope, Ont.

THE SCHOLAR'S EYE.

X.

THE EYE IN ITS RELATION TO LIGHT.

Light should not come from the front.
—It is a fact well enough known that when the eye is exposed to a bright light the pupil contracts ; when to a dim light, it expands. The reason why we do not see as well on first entering a darkened room is because we must wait until the pupil has enlarged. Should the light come from the front it causes the pupil to contract, and this becomes an evil when the source of light is brighter than the illuminated page. In such case we have what is known as "glare," which is very irritating to the eye. In such case the glare causes contraction of pupil, so that too little light enters it from the page; and so we soon have the weariness caused by too little light superadded to the worry caused by the "glare" —and this too where there is too much light—paradoxical as it may seem. The use of a shade does away with this in part. Where a shade is not in use we instinctively make a temporary one by holding the hand with its upper edge upon the forehead and lower edge projecting forward and downward, so as to partly cover the eyes, and so protect them from the light which comes directly from the source of illumination and allow them to receive that which comes by reflexion from the surface illumined.

Light should not come directly from behind.—This is chiefly because the shadow of the body diminishes the illumination. True, the shadow may not be well defined, yet its effect is as stated.

Light should not come directly from above.—-Where it does come from above, we are compelled to have the page about horizontal, otherwise it is not so well lit as it should be. Now, to have it so is objectionable. It is sure to cause a stooping posture in the child, itself an evil which should be avoided and is commonly avoidable. If to avoid stooping the page is raised to a considerable angle, we diminish the illumination of the page. It is a scientific fact that when a pencil of light falls upon a plane surface it illumines it most when a perpendicular at any

point of the plane is always parallel to the axis of the pencil of light. Optics teaches that the illumination varies as the cosine of the angle of incidence, the distance from the light to the surface illuminated remaining constant. Now, the smaller an angle the greater is its cosine. It follows then, that, as we lift the page and place it at any angle to the horizontal, the direct illumination will vary with such angle and be greatest when horizontal. It may be objected that we may avoid stooping and still incline the printed page at an angle to the horizontal, and have it *sufficiently* illuminated by increasing the light—turning on the gas for example. But this creates "glare," itself an evil. Of two avoidable evils choose neither.

Light should come from one side.—As front, rear and above have shown to to be very objectionable directions the only directions left are from the sides. It is commonly a matter of indifference which side it comes from were it not that most of us being right-handed we are to some extent in our own light when it comes from the right, as the hand and arm cast a shadow sufficient to diminish the illumination. This makes illumination from the left commonly preferred. It is best that it should come somewhat over the shoulder, as there is then a minimum of glare, yet it should not be so far towards the rear as to cause the shadow cast by the body to diminish the illumination.

It is hard to give a very definite statement as to the amount of light in general requisite, because this depends upon the exposure to different points of the compass. A Southern exposure gives the maximum ; a northern the minimum. Light also varies with the surroundings of a room, as the proximity and height of neighboring buildings, trees, &c. It has been reckoned that for a class-room containing 20 persons there should be from 4,000

to 6,000 square inches of glass, which would give each scholar from 200 to 300 square inches, or a pane of glass from 14 to 17 inches square. A room 20 feet square should not have less than about 75 square feet of glass. Can a room be too much illuminated ? it may be asked. There should be such a set of artificial shades that this can be modified according to the direction of the sun, cloudiness, and so on. In general a Northern exposure is to be avoided. The fact that a Northern exposure is preferred by the photographer and other artists is due to causes not present in a school-room of which we speak.

It is also a fact that if we reduce the illumination it has exactly the same effect as to reduce the size of the object. Hence, the less the light, we have to bring the object the nearer, thereby increasing the strain in performing the visual act. A proper illumination is then indispensable to the healthy eye. Sufficient light has an exhilarating effect on the animal spirits. This for the present does not concern us.

Dr. Cohn's investigations on near-sightedness in Germany are very elaborate. They have been already referred to. He thus expresses an opinion which is very pertinent to the present subject, and is concise and expressive. I ask the careful attention of trustees and teachers to it. He says : "The narrower the street in which the school-room was built, the higher the opposite buildings, and the lower the story occupied by the class, the greater the number of near-sighted scholars."

———

HOLD THEIR CHINS UP.

Mr. William Blaikie, author of " How to get Strong, and how to Stay So," spoke before the Brooklyn Teachers' Association recently on " Physical Education." " I want," said he, "to

see if in an informal talk we cannot hit upon some way in which we can bring the physical education of school children down to a practical basis. Our children who are healthy and buxom when they begin school-work, come out pale, sickly, and with round shoulders. If you require the children under you to sit far back on a chair and to hold their chins up, you will cure them of being round-shouldered, and the lungs and other vital organs will have free and healthy play. Another simple plan is to have the children bend over backwards until they can see the ceiling. This exercise for a few minutes each day will work a wonderful transformation. If a well qualified teacher could be employed to superintend the physical development of the children, the best results would be seen."

JUVENILE SMOKING.

The evils of juvenile smoking were recently considered at a conference of the Sunday-school and day-school teachers in Manchester, England. Dr. Emrys-Janes, of the Royal Eye Hospital, who presided, laid special stress upon the injurious influences of tobacco upon the sight, and said he was convinced that the use of tobacco, say of half an ounce a day for ten or fifteen years, resulted in serious injury to the eyes, and sometimes in absolute blindness. Resolutions were adopted setting forth that as physicians of the highest eminence declare tobacco to be injurious to health and longevity ; as smokers smoke to satisfy the same artificial craving which induces drinkers to drink; as careful statistical investigation shows that the smoking teetotaler is five times as liable to break his vow as the non-smoking teetotaler ; as smoking is an unmanly leaning on a solace to care and labor, neither sought nor needed by women, enabling the smoker to be idle without growing weary of idleness, tending to take the ambition out of him, and to make him happy when he should be miserable, and content when his divinest duty is discontent ; as it is almost impossible to smoke in an inhabited country without causing discomfort or nausea to others; and as, finally, the passion for tobacco has been the cause of many serious fires and disastrous explosions, parents, teachers, and all others who have influence with British boys, should warn them against this barbarous habit both by precept and example.

DEPARTMENT OF MODERN LANGUAGES.

INTERMEDIATE—ENGLISH LITERATURE.
Time—Two Hours and a-Quarter.
Examiner—J. M. BUCHAN.

⁎⁎ *The figure set at end of each question indicates the value to be given for an answer which is correct, so far as concerns its matter. The Examiner will add to the marks which he assigns for the matter of each answer, half as many for its literary form, provided that be correct.*

SIR ROGER DE COVERLEY.

1. Sketch the character of the Chaplain.—Value 6.

2. " The court was sat before Sir Roger came; but notwithstanding all the justices had taken their places upon the bench, they made room for the old knight at the head of them ; who, for his reputation in the country, took occasion to whisper in the judge's ear that he was glad his lordship had met with so much good weather in his circuit."

(i.) What court was this?—Value 2.
(ii.) Who are meant by 'the justices'?—Value 2.

(iii.) *For his reputation in the country.* Explain the force of 'for.'—Value 2.

3. How did the *Spectator* differ from a modern newspaper?—Value 6.

THE LADY OF THE LAKE.

4. Give an account of the gathering of the clan, introducing quotations where you can.—Value 8.

5. "But hark! what blithe and jolly peal
Makes the Franciscan steeple reel?
And see! upon the crowded street,
In motley groups what masquers meet!
Banner and pageant, pipe and drum,
And merrie morrice-dancers come.
I guess, by all this quaint array,
The burghers hold their sports to-day.
James will be there; he loves such show,
Where the good yeoman bends his bow,
And the tough wrestler foils his foe,
As well as where, in proud career,
The high-born tilter shivers spear."

(i.) Who utters these words?—Value 2.

(ii.) Write explanatory notes on 'Franciscan,' 'morrice-dancers,' 'James'—Value 6.

(iii.) Explain the meaning of ' motley,' 'quaint,' 'yeoman,'—Value 6.

(iv.) Where was it customary for the ' high-born tilter ' to shiver spear?—Value 2.

(v.) Write notes on peculiarities in the versification of this passage.—Value 4.

6. In what connection do the following passages occur?—Value 8.

(i.) "By artists form'd, who deem'd it shame
And sin to give their work a name."

(ii.) "Crags, knolls, and mounds confusedly hurl'd,
The fragments of an earlier world."

(iii.) "Who ever reck'd where, how, or when,
The prowling fox was trapp'd or slain."

(iv.) "And the stern joy which warriors feel
In foemen worthy of their steel."

7. Quote the description of the end of the combat between Fitz-James and Roderick, beginning with the lines,
"Like adder darting from his coil,
Like wolf that dashes through the toil."—Value 6.

8. State the principal differences which distinguish the poets of the age of Scott from those of the age of Addison.—Value 7.

ENGLISH GRAMMAR.

Time—Three Hours.

1.   " My own Œnone,
Beautiful-browed Œnone, my own soul,
Behold this fruit, *whose* gleaming *rind ingrav'n*
'*For* the most fair,' would seem *to award it thine,*
As lovelier than whatever Oread haunt
The knolls of Ida, *loveliest* in all grace
Of movement and the charm of married brows."—*Tennyson.*

(i.) Analyse fully.—Value 10.

(ii.) Parse the italicised words.—Vaue 42.

2. Correct the literary form of the following selections—Value 48;

"This method is rather difficult for young pupils, but by combining this method with the Look and Say method I think it forms a very good method."

"One method is to teach the words in the order they are in the lesson, the fault of this is that the pupils soon learn the words by rote, to say them even without a book.

Another is to pronounce each word after having spelt it first, the same letter having different sounds in different words confuses the child."

"The method of teaching reading, by first pointing out words and having them pronounced properly, and then the teacher reading the sentence as it should be read, and the pupils read afterwards, trying to imitate the teacher

as much as possible, is to be commended."

"In the Look and Say method the word is taught as a whole which is most natural, the words should be printed on the board and pointed out to the child until its picture is familiar to his eye he will then be able to name the word whenever he sees it."

"We may then show that this may be done by inverting the divisor and then proceed according to multiplication."

"Afterwards question the class individually upon that part that you will be sure they all know."

"First, present one object to the pupils, and ask the name of the object; they will answer an apple (or whatever name the object is), write the word 'apple' on the blackboard, and tell them that the word 'apple' stands for only one object."

"By this method children * * * are not confused by the difference of the sound of the letters when pronounced alone and their sound when combined to form a word."

"A transitive verb is a verb that the action passes from the actor to the object."

"Being there was such a number there he was afraid to proceed."

"Sir, I have just received word from the Secretary that I failed to pass the examination in Chemistry and that 'I will have to satisfy the Examiners hereafter as to my knowledge of that subject.'

As you was the Examiner in that subject I would like to know what must I do in order to pass in it.

I have now been to * * * twice attending the Normal there and if it were possible to pass without having to go again I would like it very much.

If you would be kind enough to inform me of what is the best course to pursue I would be greatly obliged."

3. (i.) Does equation rhyme with relation or occasion?—Value 2.

(ii.) Does rind rhyme with signed or sinned?—Value 2.

(iii.) Distinguish ay and aye as to pronunciation and meaning.—Value 6.

(iv.) Accentuate complaisant, sonorous, peremptory.—Value 3.

4. Distinguish between —Value 12.
Wait on and wait for.
He entered the literary profession and He entered a literary profession.
Invàlid and invalid.

5. Punctuate the following sentence in two ways.—Value 2.
John says William is both an able and a good man.

6. Correct or Justify:—Value 12.
The auxiliaries may, can, and must are by some regarded as principal verbs.
Carnaro had become very corpulent previous to the adoption of his temperate habits.
Neither I nor he live anywhere in the neighbourhood.

7. Parse the italicized words in the following sentence: Value 9.
"The results which God has connected with actions will inevitably occur, all the created *power* in the universe to the contrary *notwithstanding.*"—*Wayland.*

8. The verb agrees with its nominative in number and person. Show how this rule applies in the various cases in which a verb is preceded by two or more nominatives.—Value 16.

9. Write sixteen words derived from the Latin verb *pello.*—Value 16.

Answers to English Grammar Paper.

1. I. Sentence—"Behold this fruit."
Kind—Principal imperative.
Subject *Thou* understood.
Predicate simple—*Behold.*
Object—Fruit.
Attrib. adjunct of object—*This.*
Sentence—"Whose gleaming rind ingrav'n for the most fair would seem to award it thine."

Kind—Subordinate adjectival, qualifying *fruit.*

Subject—*Rind.*

Attrib. adjuncts of S—" Whose gleaming, ingrav'n for the most fair."

Predicate complex V. of I. P.— *Would.*

Comp's of V. of I. P.—*Seem to award thine.*

Object of C—*It.*

Sentence—" As lovelier, loveliest in all grace........brows."

Kind—Subordinate adverbial modifying *to award.*

S.—*Thou* understood.

Predicate complex—(Art) lovelier.

Attrib. of S.—loveliest......brows.

Sentence—" Than whatever Oread haunt the knolls of Ida."

Kind—Subordinate adverbial modifying *lovelier.*

S.—*Oread.*

Attrib of S.—Whatever.

Predicate simple—*Haunt.*

Object—*Knolls.*

Attrib. of O.—*The, of Ida.*

(ii) *Whose* is a relative pron. of the neuter gender, third person, and singular number agreeing with its antecedent *fruit,* and in the possessive case depending on *rind.*

Rind is a common noun of the third person, singular number, neuter gender, and in the nominative case being the subject of the verb *would.*

Ingrav'n is the perfect participle of the verb to ingrave, in the attributive relation qualifying the noun *rind.*

For is a preposition showing the relation between a verb understood and *fair.*

To award is a transitive verb of the weak conjugation, active voice and in the present indefinite tense of the infinitive mood forming the complement of the V. of I. P. *seem,* or more simply, depending on *seem.*

It is a demonstrative pronoun of the third person, singular number and neuter gender, in the objective case governed by the verb *to award.*

Thine is a possessive adjective qualifying the pronoun it and forming the objective complement of *to award.*

As is a subordinate causal conjunction connecting *to award* and the sentence (thou art) lovelier.

Lovelier is a qualitative adjective in the comparative degree and predicative relation, qualifying the pronoun *thou* understood.

Then is a subordinate adverbial conjunction connecting *lovelier* and the sentence 'Whatever Oread haunt, &c.,' and modifying *haunt.*

Whatever is a compound indefinite adjective without comparison and in the attributive relation qualifying the noun Oread.

Oread is a proper noun of the third person, singular number and neuter gender, in the nominative case, being the subject of the verb *haunt.*

Haunt is a transitive verb, of the weak conjugation, in the active voice and subjunctive mood and in the third person and singular number to agree with its subject Oread.

2. " This method is rather difficult for young pupils, but by combining this method with the Look and Say method, I think it forms a very good method."

Amended form—This method is rather difficult for young pupils, but by combining it with the Look and Say method, a very good system would, I think, be formed.

" One method is to teach the words in the order in which they occur in the lesson; the fault of this is that the pupils soon learn the words by rote, to say them even without a book.

Amended form—One method is to teach the words in the order in which they occur in the lesson ; the fault of this is that pupils soon learn to repeat the words by rote.

" Another is to pronounce each word after having spelt it first, the same letter having different sounds in different words confuses the child."

Amended form—Another is to pro-

nounce each word after having first spelt it. By this method, the child is confused because the same letter has frequently different sounds in different words.

The method of teaching reading by first pointing out the words and having them pronounced properly, and then the teacher reading the sentence as it should be read, and the pupils read afterwards, trying to imitate the teacher as much as possible, is to be commended.

Amended form—The method of teaching reading, by first pointing out the words, pronouncing them properly, then reading the sentence as it should be read, and finally having the pupils read after the teacher, imitating him as closely as possible, is to be commended.

" In the Look and Say method, the word is taught as a whole which is most natural, the words should be printed on the board and pointed out to the child until its picture is familiar to his eye, he will then be able to name the word whenever be sees it."

Amended form—In the Look and Say method, the word is taught, in what is the most natural way as a whole; it should be printed on the board and kept before the eye of the child until the picture of the word is so familiar to his eye that he will be able to name the word whenever he sees it.

" We may then show that this may be done by inverting the divisor, and then proceed according to multiplication."

Amended form—We may then show that this can be done by inverting the divisor, and then proceeding according to the rule for multiplication.

" Afterwards question the class individually upon that part, that you will be sure they all know."

Amended form—Afterwards question the class individually upon that part, until you are sure that they all know it.

" First, present one object to the pupils, and ask the name of the object;

they will answer an apple, (or whatever name the object is), write the word 'apple' on the blackboard and tell them that the word 'apple' stands for only one object."

Amended form—First, present an object to the pupils and ask them its name; they will answer 'an apple' (or whatever may be the name of the object); next, write the word ' apple ' on the blackboard, and then tell them that the word 'apple' stands for only one object.

" By this method children * * * are not confused by the difference of the sound of the letters when pronounced alone and their sound when combined to form a word."

Amended form—By this method, children * * * are not confused by the difference between the sounds of the letters when pronounced separately, and their sounds when combined to form words.

" A transitive verb, is a verb that the action passes from the actor to the object."

Amended form—A transitive verb, is one that denotes action passing from the actor to the object.

" Being there was such a number there, he was afraid to proceed."

Amended form—As there was such a number there, he was afraid to proceed.

" Sir, I have just received word from the Secretary that I failed to pass the examination in Chemistry, and that I will have to satisfy the examiners hereafter as to my knowledge of that subject."

Amended form—Sir, I have just received word from the Secretary that I failed to pass the examination in Chemistry, and that I will have to satisfy the examiners hereafter as to my proficiency in that subject.

" As you was the examiner in that subject, I would like to know what must I do in order to pass in it."

Amended form—As you were the examiner in that subject, I would like to

know from you what I must do in order to pass in it.

"If you would be kind enough to inform me of what is the best course to pursue, I would be greatly obliged."

Amended form—If you would kindly inform me what is the best course to pursue, I would be greatly obliged.

3. (i) Does equation rhyme with relation or occasion ? It rhymes with relation.

(ii) Does rind rhyme with signed or sinned ? It rhymes with signed.

(iii) Distinguish ay and aye as to pronunciation and meaning.

Ay is an affirmative adverb; it is pronounced like the long sound of the letter I.

Aye means always, ever, and it has the long sound of the letter A.

(iv) Accentuate complaisant, sonórous, perémptory

' Wait for ' means to delay in expectation of being joined by a person.

' He entered the literary profession ' means that he became author by profession.

' He entered a literary profession ' means that he entered a profession more closely connected with literature and learning than many others, the legal profession for example.

Invàlid means not valid, weak, of no weight.

Invàlid means weak infirm; it is frequently used as a noun, while the first word is generally an adjective.

5. Punctuate the following sentence in two ways :—

John says William is both an able and a good man.

Punctuated :—

1. John says " William is both an able and a good man."

2. " John," says William, " is both an able and a good man."

6. Correct or justify :—

(a) The auxiliaries may, can, and must, are by some regarded as principal verbs.

(b) Cornaro had become very cor-

pulent previous to the adoption of his temperate habits.

(c) Neither I nor he live anywheres in the neighbourhood.

(a) This sentence may be regarded correct. The idea which is somewhat concisely expressed, is to the effect that the author regards as auxiliaries verbs which some other grammarians consider to be principal verbs.

(b) Objection may be taken to the phrase "previous to the adoption of his temperate habits." The gerundial form in *ing* would be preferable as conveying more distinctly the idea of action. The termination *tion* has a passive significance and is hence more indefinite, and it consequently requires the agent of the action to be mentioned. It would be better to say " previous to his adopting temperate habits."

(c) Incorrect—*Anywheres* does not take the termination *s* in good English, and it is usual to place the pronoun I last. The sentence should read "Neither he nor I live anywhere in the neighbourhood."

7. Parse the italicized words in the following sentence :

"The results which God has connected with actions will inevitably occur, all the created *power* in the universe *to* the contrary *notwithstanding.*

Power is an abstract noun of the third person, singular number and neuter gender, in the nominative case used absolutely.

To is a preposition showing the relation between the noun *power* and the adjective *contrary* which is here used as a noun.

Notwithstanding is in parsing divided into two words, *not* and *withstanding,* like the word *cannot.* *Withstanding* is the imperfect active participle of the verb to withstand; it is in the attributive relation qualifying the noun *power.*

Not is an adverb modifying *withstanding.*

Many grammarians are in favor of parsing such words as notwithstanding,

pending, &c., as prepositions, but the parsing given above is the preferable one, as it explains better the use and origin of such words,

8. The verb agrees with its nominative in number and person. Show how this rule applies in the various cases in which a verb is preceded by two or more nominatives. See Angus's Hand Book, Section 367.

Write sixteen words derived from the Latin verb *pello*. Consult Chambers' Philological Dictionary.

COMPOSITION.

Time—One Hour and a-Quarter.

Examiner—J. WATSON, M.A., LL.D.

(Only One Question to be attempted.)

1. Tell the incidents in any one of Sir Walter Scott's novels or poems.

2. Write a life of any distinguished man of letters.

3. Discuss, from your own point of view, the question as to the Protection of Native Industries.

4. Give a summary of Tennyson's *Princess*, or explain the meaning of his *Palace of Art.*

DICTATION.

Time—Thirty Minutes.

Examiner—S. A. MARLING, M. A.

Note for the Presiding Examiner.— This paper is not to be seen by the candidates. It is to be read to them *three times—first*, at the ordinary rate of reading, they simply paying attention, to catch the drift of the passage; *second*, slowly, the candidates writing; *third*, for review.

It was not only by the efficiency of the restraints imposed on the royal prerogative that England was advantageously distinguished from most of the neighbouring countries. A peculiarity equally important was the relation in which the nobility stood here to the commonality. There was a strong. hereditary aristocracy, but it was least insolent and exclusive. It had none of the invidious character of a caste. The dignity of knighthood was not beyond the reach of any man who could, by diligence and thrift, realize a good estate, or who could attract notice by his valour in a battle or a siege. It was no disparagement for the daughter of a duke, nay, of a royal duke, to espouse a distinguished commoner. Thus Sir John Howard married the daughter of Thomas Mowbray, duke of Norfolk. Sir Richard Pole married the Countess of Salisbury, daughter of George, duke of Clarence. Between good blood and the privileges of peerage there was, fortunately for our country, no necessary connection. Pedigrees as long, and scutche. ns as old, were to be found out of the House of Lords as in it. There was therefore, here no line like that which, *in some other countries,* divided the patrician from the plebian.

HISTORY.

Time—Two Hours and a-Half.

Examiner—JNO. WATSON, M.A., LL.D.

1. Describe fully the social condition the Anglo-Saxons.—Value 18.

2. What were the chief public acts of William I ? Give some idea of the Feudal System ; describe the way of living of the Normans, and estimate their influence on the English tongue. —Value 18.

3. Explain the causes which gave rise to the Civil War, and sketch the history of England under the Commonwealth.—Value 18.

4. When was the British North America Act passed? Explain its provisions, and state the duties assigned by it to the Dominion and Provincial Legislatures respectively.—Value 18.

5. Give an account of the Second Punic War, and of the struggle of the Plebians for political rights.—Value 18.

6. What was Quebec Act of 1774, and how was it received ?—Value 10.

GEOGRAPHY.

Time—Two Hours.

Examiner—S. ARTHUR MARLING, M.A.

1. What are the natural divisions of South America? What the political?—Value 9.

2. State the principal causes which modify the climate of a country, and give examples.—Value 9.

3. How are the frontiers between Austro-Hungary and Turkey, and between Greece and Turkey, marked out?—Value 9.

4. Sketch the Atlantic coast line of the United States, marking the position of the chief capes, and of the inlets with the cities thereon.—Value 16

5. Shew how the latitude of a place is determined, and give the latitude of New York, Toronto, Montreal, Florence, the Cape of Good Hope.—Value 13.

6. Describe (by a diagram if you can) the proposed route of the Canadian Pacific Railway, and show how it connects, through Canadian territory, with the Atlantic seaboard—Value 11.

7. State the geographical position and the political relation of Candahar, Herat, Natal, Zanzibar, Hong-Kong, Corsica, Alsace.—Value 13.

8. State the form of government, religion and chief products of Egypt, Brazil, Cuba, Bengal, Switzerland and Cyprus.—Value 13.

9. What rivers flow from near the St. Gothard Pass in Switzerland, and what are their respective courses?—Value 7.

FRENCH.

Time—Three Hours.

Examiner—S. ARTHUR MARLING, M.A.

I.

DE BONNECHOSE: *Lazare Hoche.*

Translate:—Value 22.

(*a*) Déjà toute cette contrée était en armes: elle avait livré ses premiers com-bats, et les genéraux républicains, reculaient devant les La Rochejaquelein, les Bonchamp, les d'Elbé, les Lescure. Hoche reconnut les fautes qu'ils avaient faites: il devina la tactique toute particuliére que réclamait la guerre dans ce pays qu'il n'avait jamais vu, mais qu'il étudiat dans les relations militaires et sur la carte. Il démontra la nécessité d'y étabeir des camps retranchés, d'y former des colonnes mobiles, d'imiter, dans sa manière de combattre, un ennemi presque insaisiss-able; et dans le jeune capitaine de vingt-quatre ans s'annonça déjà le général en chef des armées de l'Ouest et del' Océan.

1. *Coutrée*—What is meant and where is it situated?—Value 4.

2. *Que réclamait*—Parse *que.* Value 3.

3. *Toute particuliere*—Give the rule for *toute* here.—Value 4.

4. *Colonnes mobiles* — Derive, and explain the meaning.—Value 5.

5. Write short notes on ' Les régicides,' 'La Commune,' 'Les girondins.' Value 6.

6. What comparison does this author make between the tactics of Hoche and those of Napoleon?—Value 6.

7. Give the English of these phrases—' un arrêt de mort,' 'il fit part au gouvernement de ses apprehensions,' 'à l'apogée de son puissance,' ' il fut enlevé à l' amour de ses soldats,' ' coup d'état de Fructidor.'—Value 15.

Translate:—Value 42.

(*b*) Il était impossible qu'un régime aussi affreux que celui de *la Terreur* ne provoquât point une violente re-action d'une longue durée, et que les hommes qui l'avaient établi ne fussent bientôt en butte à la haine publique et à l'horreur générale. Cette réaction, commencée le 9 thermidor 1794, con-

tinua durant les années suivantes avec une violence toujours croissante, entretenue par une cause dont les historiens n'ont pas tenu suffisamment compte. Le régime de la Terreur était tombé, mais la plupart de ceux qui l'avaient intronisé ne tombèrent pas avec lui : quelques scélérats av..ient péri, mais le plus grand nombre des conventionnels qui les avaient soutenus de leurs votes restérent debout et maîtres de la situation. La Convention survécut une année à Robespierre, et lorsqoe enfin elle se retira de la scéne, elle réussit à vivre de nouveau sous d'autres noms. Elle dit et parvint à faire croire à une foule de républicains ardents et honnêtes, au général Hoche entre autres, que la Révolution était incarnée dans les conventionnels, et elle fit violence à l'opinion publique en déclarant, par les décrets de fructidor an III, que les deux tiers de ses membres feraient partie des nouveaux conseils législatifs dont ils formeraient ainsi la majorité.

1. *La Terreur* — Explain briefly what is meant.—Value 4.

2. Parse *provoquât, survécut, croissante.*—Value 12.

3. ' *Conseils legislatifs* '—What were these called ? Value 4.

4. *En• buttes*—Give other examples of this use of *en* in this work.—Value 5.

5. ' Incarnée dans les conventionnells.' Explain.—Value 4.

II.

DE FIVAS: *Introduction.*

Translate :—Value 18.

Maître corbeau, sur un arbre perché,
  Tenait en son bec un fromage.
Maître renard, par l'odeur alléché,
  Lui tint à peu près ce langage
  Hé ! bonjour, monsieur du corbeau !
Que vous êtes joli ! que vous me sem-
  .blez beau !

Sans mentir, si votre ramage
Se rapporte à votre plumage,
Vous êtes le phénix des hôtes de ces
  bois.
A ces mots, le corbeau ne se sent
  pas de joie ;
Et pour montrer sa belle voix,
Il ouvre un large bec, laisse tomber
  sa proie.

1. *Le phénix*—Explain the allusion. —Value 4.

2. *Du corbeau*—What does the *du* mean ?—Value 2.

3. Anote the conclusion of this fable (in French).—Value 12.

4. *Ouvre* —Parse, and give the principal parts.—Value 6.

III.

GRAMMAR AND COMPOSITION.

1. Write the singular of *bestiaux, yeux* ; the feminine of *directeur, duc, esclave, chrétien, connaisseur* ; the French for the possessive pronouns 'ours,' 'his,' 'theirs' in masc. and fem., singular and plural.—Value 15.

2. Construct an example to show how 'the former' and 'the latter' are expressed in French. Value 8.

3. Explain the difference of use between 'que' and 'quoi,' and write in French, 'What shall I say to you?"

4. Give the principal parts of *naître, maudire, bâtir, nuire, pleuvoir, mettre;* the third pers. sing., pres. subj. of *s'asseoir, moudre, s'en aller, vaincre, envoyer.*—Value 22.

5. Write a list of nouns varying in meaning according as they vary in gender and give their meanings.— Value 5.

6. Render into French—

   a. All soldiers are not Cæsars.— Value 4

   b. Taught (instruire) by experience, old people are suspicious.— Value 4.

   c. We ate an excellent pineapple at dinner—Value 4.

d. The knife and fork are not clean.—Value 4.

e. My head aches.—Value 4.

f. Is your cousin (fem.) diligent or idle?—Value 4.

g. " When I was eighteen years old, I used to go, during the fine season, to Versailles, the city where my mother lived. As I went out of the ' barriers,' I was always sure to find a tall mendicant, who cried in a shrill (glapissant) voice, " Charity, if you please, my good sir ! " On his side, he was very sure to hear a large penny piece clink (résonner) in his cap. Value 2.

7. Translate :—Value 20.

Le palais des rois de Suède, comme la ville elle-même, tire sa principale beauté de sa position : il est entre la mer et le lac ; il a la forme carrée ; une de ses façades domine un beau pont de pierre jeté sua le Melar. Ce pont, dont l'arche du milieu repose sur une petite île transformée en un charmant jardin, est dun aspect .avissant. L'architecture du palais rappelle la cour du Louvre, modifiée par le goût lourd, sobre et froid du dix-huitième siècle ; les proportions de son ensemble peuvent seules être louées sans réserve ; la façade du côté de la mer, précédée d'un jardin, ornée d'un large balcon de pierre, estd'un bel effet, sourtout vue de loin.

LATIN.

Time—Three Hours.

Examiner—J. WATSON, M. A., LL. D.

CICERO, *in Catilinam*, II., Cap. xii.

Translate :

Atque hæc omnia sic agentur, Quirites, ut res maximæ minimo motu, pericula summa nullo tumultu, bellum intestinum ac domesticum, post hominum memoriam crudelissimun ac maximum, me uno togato duce et imperatore. sedetur. Quod ego sic administrabo, Quirites, ut, si ullo modo fieri poterit ne improbus quidem quisquam in hac urbe pœnam sui sceleris sufferat. Sed si vis manifestæ audaciæ, si impendens patriæ periculum me necessario de hac animi lenitate deduxerit ; illud profecto perficiam, quod in tanto et tam insidioso bello vix optandum videtur, ut ne quis bonus intereat, paucorumque pœna vos jam omnes salvi esse possitis.—Value 16.

(1) Mark the quantity of the penult in *Quirites, intestinum, improbus, possitis.*—Value 5.

(2) Distinguish between *quisquam* and *ullus.* In what sort of sentence is *quisquam* used ?—Value 5.

(3) Give the derivation and meaning of *Quirites.* With what is it contrasted? —Value 6.

(4). What idea is implied by the participle in—*dus ?* Does *optandum* convey that idea here ?—Value 8.

(5). Parse : *Sedetur, sufferat, deduxerit.*—Value 12.

(6). In what year of the city of Rome were these orations delivered, and what was Cicero's age at the time? —Value 16.

(7). Mention various ways of expressing purpose, giving examples in Latin. Value 18.

(8). State when the gerundive is preferable to the gerund, and when the gerund must be used.—Value 14.

VIRGIL—*Æneid*, I., 254-266.

Translate :

Olli subridens hominum sator atque deorum
Voltu, quo coelum tempestatesque serenat,
Oscula libavit natae ; dehinc talia fatur
Parce metu, Cytherea ; manent immota tuorum

Fata tibi ; cernes urbem et promissa Lavinï
Moenia, sublimemque feres ad sidera coeli
Magnanimum Aenean : neque me sententia vertit.
Hic tibi (fabor enim, quando haec te .cura remordet,
Longius et volvens fatorum arcana movebo)
Bellum ingens geret Italia, populosque feroces
Contundet, moresque viris et moenia ponet,
Tertia dum Latio regnantem viderit aestas,
Ternaque transierint Rutulis hiberna subactis.—Value 20.

(1) Give the derivation of *voltus, ocsulum, sublimis, sidus.*—Value 8.

(2) Parse : *parce, cernes, fabor, contundet, subactis.*—Value 15.

(3) Distinguish between : *moenia, murus, paries ; vultus, facies ; longe, procul, diu.*—Value 13.

(4) What is the case of *olli* and *metu ?* How are they governed ?—Value 10.

(5) In what case is *Rutulis ?* Give the rule.—Value 6.

(6) Write short notes on *Cytherea, Lavinium, Æneas, Rutuli.*—Value 9.

(7) Scan vu. 256, 257, 260, marking quantities.—Value 9.

(8) What is the quantity in pollysyllabic words of a vowel preceding c, d, l, m, n, r, t, at the end of a word ? Mention exceptions. Value 10.

GRAMMAR AND COMPOSITION.

1. What terminations of the 3rd Decl. have—*i* in the ablative singular ? —Value 6.

2. Compare *pulcher, pius, facilis.* What other adjectives are compared like *facilis ?*—Value 15.

3. Mention the *preteritive* and the *neuter-passive* verbs.—Value 12.

4. Mention the government of *miseret.* What other verbs adopt the same construction ? Value 10.

5. What is the construction after impersonal verbs ? Value 10.

6. After what particles does *quis* stand for *aliquis ?* Value 8.

7. What is the construction after verbs of commanding ? Value 10.

8. When does *quum* take the subjunctive, and when the indicative? Value 5.

9. Translate into Latin :—

(*a*) Fabius Pictor was sent, by order of the Senate, to the oracle of Apollo at Delphi, to inquire (scitor) by what prayers they might appease the gods. Value 8.

(*b*) And not to be tedious, O Romans, we ordered the tablets, which were said to have been written by each, to be produced We first showed the seal to Cethegus : he acknowledged it ; we cut the thread ; we read. It had been written with his own hand to the Senate and the people of the Allobroges, that he would do that of which he had assured their ambassadors. Value 10.

DEPARTMENT OF MATHEMATICS.

INTERMEDIATE EXAMINATION.

ARITHMETIC.

Time—Three Hours.

Examiner—J. C. GLASHAN.

1. Find the L. C. M. of 545, 26487, 1853, 11421.—Value 5.

One kind of brick is $4\frac{1}{2}$ inches long and $2\frac{3}{4}$ high; another 5 inches long and $3\frac{1}{2}$ high. What is the size of the least piece of wall, height being same as length, that can be constructed of either kind of brick.—Value 9.

2. Define the numerator and denominator of a fraction, and from your definitions *prove* that

$$\tfrac{2}{3}\times 5 = \tfrac{10}{3},\ \tfrac{2}{3}\times\tfrac{5}{7}=\tfrac{10}{21}.\text{—Value 6.}$$

3. Simplify

$$\left\{ \frac{\tfrac{2}{5}\ \text{of}\ 11\tfrac{1}{4}+\tfrac{2}{7}\ \text{of}\ 7\tfrac{2}{7}}{33\tfrac{1}{8}-6\tfrac{1}{8}}+8\tfrac{7}{16}\right\} \div$$

$$\left\{\frac{\tfrac{1}{2}\ \text{of}\ 6\tfrac{3}{4}-2\tfrac{1}{8}}{25+\tfrac{1}{7}\ \text{of}\ 3\tfrac{1}{8}}\right\}\text{—Value 6.}$$

Add together $\frac{3}{5}$ of 1 wk. 2 dys. 17 hrs., $\frac{4}{5}$ of 17 hrs. 23 min. 26 sec., and $\frac{4}{7}$ of 2 dys.

(Accuracy of result essential in preceding fractions.)

4. Describe briefly the metric system of measures.—Value 6.

If a gallon contain 277 cub. inc., and a dekalitre contain 17.6077 pints, express a metre in inches.—Value 8.

5. If A walk 7 hours a day, and B 6 hours a day, and if, under like conditions, B can walk 6 miles while A is walking 5, how many days will A be walking down hill a distance which B accomplished up hill in 3 days; supposing that a man's rate of walking is increased by one-third in going down hill, and decreased by one-fourth in going up?—Value 10.

6. If 1,000 men can excavate a square basin whose side is 1,600 yds., and which is 30 yds. deep, in 9 months, how many will be required to excavate a square basin whose side is 2,000 yds., and which is 40 yds. deep, in 12 months?—Value 7.

7. The hands of a clock move irregularly, the hour hand moving 5 per cent. too fast, and the minute hand 10 per cent. too slow. In 15′ (true time) they will be together; how many minutes, measured on the face of the clock, are they apart now?—Value 10.

8. A money lender has $1,500 out at 8 per cent., $1,200 at $7\frac{1}{2}$, and $1,000 at 6; find the percentage he receives on the average.—Value 7.

9. A mortgage for $1,000, paying 7 per cent. per annum, payable yearly, has two years to run; what should a loan society give for the mortgage that it may receive 8 per cent. on its investment, it being assumed that all moneys received by the society can be lent out at 8 per cent.?—Value 12.

SOLUTIONS.

1—L. C. M. 541, 26487, 1853, 11421
= 105815565. Ans.

L. C. M. $4\frac{1}{2}$ and 5 = 45

"　"　" of $2\frac{3}{4}$ and $3\frac{1}{2}$ = $38\frac{1}{2}$.

∴ L. C. M. of 45 and $38\frac{1}{2}$ = $1732\frac{1}{2}$ inches.

Ans.

2.—Book-work.

3.—

(*a*) $1732\frac{2543}{4704}$ Ans.

(*b*) 5 days, 21 hours, 11 minutes, $53\frac{13}{35}$ seconds. Ans.

4.—

(*a*) Book work.

(*b*) 1 dekalitres = 10 litre
1,000 C. litres = 1 C metre

100 dekalitres = 1 C. metre

100 " = 17·6077 + 100 pts

$$= \frac{1760\cdot77}{8} \text{ gallons.}$$

1 gallon equal 272 cubic metres.

$$\therefore \frac{1760\cdot77}{8} \text{ gallons} = \frac{1760\cdot77}{8} + \frac{277}{1}$$

cub. inches.

$$1 \text{ metre} = \sqrt[3]{\frac{1760}{8} \times \frac{277}{1}} = 39\cdot3 \text{ inches.}$$

5. A can walk $\frac{5}{6}$ as fast as B under like conditions ; but a increases his speed 3 in going down hill.

∴ his relative speed would be $\frac{5}{6} \times \frac{4}{3} \times \frac{7}{1} = 7\frac{7}{9}$.

B's rel. speed $= \frac{3}{4} \times 6 = 4\frac{1}{2}$.

A's time $= 3 \times 4\frac{1}{2} \div 7\frac{7}{9} = 1\frac{103}{140}$

6. $= \frac{1000}{1} \times \frac{1}{1600} \times \frac{1}{1600} \times \frac{1}{30} \times \frac{9}{1} \times$

$\left(\frac{2000}{1}\right)^2 \times \frac{40}{1} \times \frac{1}{12} = 1562\frac{1}{2}$, or 1563 men.

7.—In 1 hour the hour hand moves over $5\frac{1}{4}$ minutes.

In 15 minutes the hour hand moves $1\frac{5}{16}$ minutes.

Again, the minute hand in 1 hour moves over 54 minutes ; in 15 minutes moves over $13\frac{1}{2}$ minutes.

$13\frac{1}{2} - 1\frac{1}{16} = 12\frac{3}{16}$. Ans.

8. Int. of $1,500 at 8 % = $120.

" " 1,200 at $7\frac{1}{2}$ % = $90.

" " 1,000 at 6 % = $60.

Total interest = $2270 ; total principal = $3700

$\therefore \frac{270}{3700}$ of $\frac{100}{1} = 7\frac{11}{37}$ %. Ans.

9.—Pres. worth of $1070 at 8 per cent = $990.74 ; to this add $70 = $1060.74

P. W. of $1060.74 at 8 % = $982.16 +

ALGEBRA.

Time—Two Hours and a-Half.

Examiner—ACFRED BAKER, M. A.

1. Factor $x^3 + y^3$; and $x^3 + y^3 + z^3 - 3xyz$.—Value 4.

Utilize your results to shew that

(1). $(x+z)^3 + (y-z)^3 - (x+y)(x-y+2z)^2 = (x+y)(yz-zx+xy-z^2)$.—Value 4.

(2). $(a^2-bc)^3 + (b^2-ca)^3 + (c^2-ab)^3 - 3(a^2-bc)(b^2-ca)(c^2-ab) = (a^3+b^3+c-3abc)^2$.—Value 7.

2. If $a^2 - bc = b^2 - ca$, and a be not equal to b, then $a(b^2+bc+c^2) + b(c^2+ca+a^2) + c(a^2+ab+b^2) = 0$.—Value 6.

3. Shew how to find the L. C. M. of two Algebraic expressions.—Value 6.

Find the conditions that $x^3 + ax^2 + b$ and $x^3 + cx + d$ may have a L. C. M. of the form $x^4 + px^3 + qx^2 + rx + s$.—Value 8.

4. Simplify

$$\frac{(x+y)z^3}{(y-z)(z-x)} + \frac{(y+z)x^3}{(z-x)(x-y)} + \frac{(z+x)y^3}{(x-y)(y-z)}. \quad \text{Value 6.}$$

5. Extract the square root of

(1). $2\left(1 - \frac{b^2+c^2-a^2}{2bc}\right)\left(1 - \frac{c^2+a^2-b^2}{2ca}\right)\left(1 - \frac{a^2+b^2-c^2}{2ab}\right)$

(2). $x^4 + x^3 + 2\frac{9}{4}x^2 + \frac{7}{2}x + \frac{49}{4}$.—Value 4.

6. Find the value of x in $(x+a)(b-c) + (x+b)(c-a) + (x+c)(a-b) = 0$. Explain result.—Value 7.

7. Find an expression for k in terms of a, b, c, that will make

$$\frac{b^2-c^2}{k-a} + \frac{c^2-a^2}{k-b} + \frac{a^2-b^2}{k-c}, \text{ vanish. Value 7.}$$

8. If for every $3.00 of income A has, B has $2.00 ; for every $12.00 A spends, B spends $1.00 ; and for every $4.00 A saves, B saves $5.00 ; find the portion of his income that A saves.—Value 7.

9. Solve the equations

(1). $\frac{x+1}{5} + x(x-1) = (x-1)^2$. Value 4.

(2). $\frac{1}{x-a} - \frac{1}{x-2a} = \frac{1}{x-3a} - \frac{1}{x-4a}$

Value 7.

(3). $\dfrac{2x^3+2x^2+3x+1}{x^2+x+1} = \dfrac{x^2-x+1}{x-1} +$

$\dfrac{x^4-x+1}{x^3-1}$.   Value 8.

(4). $\left.\begin{array}{l} x^2+xy+y=25 \\ x+xy+y^2=31 \end{array}\right\}$ Value 10.

SOLUTIONS TO PROBLEMS.

I. (1) Since $x^3 + y^3 =$

$$(x+y)(x^2-xy+y^2)$$

$\therefore (x+z)^3 + (y-z)^3 = (x+z+y-z)$

$\times \left\{ \overline{x+z}^2 + \overline{y-z}^2 - (x+z)(y-z) \right\}$

$\therefore$ We may divide thro' by $x+y$ and have left to prove

$$(x+z)^2 + (y-z)^2 - (x+z)(y-z)$$
$$- (x-y+2z)^2$$
$$= yz - zx + xy - z^2$$
$$= (x+z)(y-z)$$

that is that

$$(x+z)^2+(y-z)^2-2(x+z)(y-z)$$
$$= (x-y+2z)^2$$
$$= (\overline{x+z}-\overline{y-z})^2$$

(2). The factors of

$$x^3+y^3+z^3-3xyz$$

are $x+y+z$ and

$$x^2+y^2+z^2-xy-yz-zx$$

or $(x-y)^2 + (y-z)^2 + (z-x)^2, \div 2$

$\therefore$ the factors of left hand member of (2) are

$a^2+b^2+c^2-ab-bc-ca$ and $\frac{1}{2}$ of

$(a^2-bc-b^2+ca)^2 +$ an. $+$ an.

and this last factor $= \frac{1}{3}$ of

$(a+b+c)^2 (a-b)^2 +$ an. $+$ an.

$= (a+b+c)^2 (a^2+b^2+c^2-ab-bc-ca$

$= (a+b+c)(a^3+b^3+c^3-3abc)$

II. $a^2-bc = b^2-ac$

$a^2-b^2 = bc-ac$

$\therefore a+b = -c$.   Supply in original equation.

$c = -a-b$

$a(a^2+ab+b^2) + b(a^2+ab+b^2) -$

$(a+b)(a^2+ab+b^2)=0$

III. Divide each expression into the L. C. M. and put rems. $=$ to zero.

$\therefore$ Then $q = c$

$r = b$

$s = pd$

or $ap-a^2 = q$

IV. Add the fractions and factor the numerator, which will be

$(x-y)(y-z)(z-x)(-xy-xz-yz)$ the first three being the same as Denominator.

Ans. $-xy-xz-yz$

V. (1) Ans. $\dfrac{(a+b-c)(b+c-a)(c+a-b)}{2abc}$

(2) Ans. $x^2 + \dfrac{x}{2} + \dfrac{7}{2}$

VI. $x = 0$

VII. $k = a+b+c$

VIII. Let $x =$ A's income

$\therefore \dfrac{2x}{3} =$ B's income

Let $y =$ that A spends

$\dfrac{7}{12} =$ that B spends

$x-y =$ what A saves

$\dfrac{5}{4}(x-y) =$ what B saves

$\dfrac{2}{3}x = \dfrac{y}{12} + \dfrac{5}{4}(x-y)$

$2y = x$

$y = \dfrac{x}{2}$

A spends half his income.

IX. (1) $x = \dfrac{2}{3}$

(2) Simplify and get $\dfrac{\dfrac{1}{(x-a)(x-2a)}}{\dfrac{1}{(x-3a)(x-4a)}} =$

$4ax = 10a^2$

$x = \dfrac{5}{2}a$

(3) $x = \dfrac{2}{3}$

(4) Add two equations and let $m = x + y$.

$\therefore m^2 + m = 56$

$m = 7$

$x+y = 7$

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

$7x + y = 25$

$x + y(x+y) = 31$

$x + 7y = 31$

$x = 3$

$y = 4$

EUCLID.

Time—Two hours and a-half.

Examiner—ALFRED BAKER, M. A.

(All intelligible abbreviations permitted.)

1. Shew clearly that in Book I. Euclid proves that if the three sides of a triangle be given, or two sides and the contained angle, then the triangle is determinate. (The proofs of the propositions in which this is made out are not required.) Value 8 for clear answer.

Is there any other case in which Euclid shews that if certain parts be given the triangle is determinate? —Value 3.

2. If two parallel lines be also equal, the lines joining their ends are either parallel and equal, or else they bisect one another.—Value 10.

State converses of these propositions, and prove one of such converses.—Value 6.

3. If a parallelogram be on the same base with a triangle, and both have the same altitude, the former is double the latter.—Value 6.

4. Shew that the square on the hypothenuse of a right-angled triangle is equal to the sum of the squares on the sides.—Value 9.

5. ABCD is a quadrilateral having AD parallel to BC; shew that if E be the bisection of AB, the triangle ECD is half the quadrilateral.—Value 9.

Shew also that if F be the bisection of AD, and FBC be half the quadrilateral, then the quadrilateral is a parallelogram.—Value 9.

6. ABCD is a quadrilateral having the sides DA, DC respectively greater than BA, BC; prove that if BA, CD ; meet, when produced, towards A and D, then will DA, CB meet, when produced towards A and B.—Value 9.

7. Shew how to divide a straight line into two parts such that the rectangle contained by the whole line and one part may be equal to the square on the other part.—Value 10.

Shew how to produce AB to C, so that the rectangle contained by AC, CB may be equal to the square on AB.—Value 7.

8. Construct a square equal to a given rectangle.—Value 8.

SOLUTIONS TO PROBLEMS FROM CORRESPONDENTS.

1. There are two amalgams of the same bulk, each composed of mercury and gold, one in the ratio of 2 : 9, and the other 3 : 19. If they are fused together, what will be the ratio of mercury to gold in the resulting mixture ?

In the first amalgam the mercury is $\frac{2}{11}$, and therefore the mercury in the first amalgam, will be $\frac{1}{11}$ of the resulting mixture. Similarly the mercury in the second amalgam will be $\frac{3}{44}$ of the resulting mixture ; consequently, the mercury will be $\frac{7}{44}$ of the mixture, and ∴ the ratio required is 7 : 37.

2. Find a number whose cube exceeds six times the next greater number by three.

Let x be the number required ; then we shall have

$$x^3 - 6(x+1) = 3$$
$$\therefore x^3 - 6x - 9 = 0$$
$$\text{or } (x-3)(x^2 + 3x + 3) = 0$$
$$\therefore x - 3 = 0, \text{ or } x = 3.$$

3. A hollow cylinder, whose height is six feet while the radius of the base is one foot, is filled with water. Find the pressure of the water on the interior of the vessel; first, when the vessel stands on its base on a horizontal floor, and secondly, when it lies on its side on a horizontal floor.

The area of each end of the cylinder is $3\frac{1}{7}$ square feet, and the area of the curved surface is $\frac{44}{7} \times 6 = 37\frac{5}{7}$ ∴ the area of the surface of the cylinder is 44 square feet. Now, _firstly_, when the cylinder stands on end, the depth of the cen. of gravity of the cylindrica surface below the highest point of the water is 3 feet, ∴ the pressure required is equal to

the weight of 44×3, or 132 cubic feet of water, which is 8,250 lbs. In the second case this depth is one foot, and ∴ the pressure is 2,750 lbs.

4. A owes B $1,000; but is able to raise only $600; with this he proposes to pay part of the debt, and the interest in advance on the remainder, on his note for 2 years at 10 per cent. For what sum ought the note to be drawn?

The interest (at single interest) will be one-fifth of the note. So that when one-fifth of the note has been taken from $600, the remainder together with the note will make up $1.000.

$$\therefore \text{ note } + 600 - \tfrac{1}{5} \text{ of note } = 1,000$$
$$\text{or } \tfrac{4}{5} \text{ of note } = 400$$
$$\therefore \text{ note } = 500.$$

At compound interest we should have $\tfrac{21}{100}$ instead of $\tfrac{1}{5}$, and the note will be for $506.33.

5. A Trust and Loan Society wish to make 12 per cent. on their capital. Instalments can be invested at six per cent. per annum, payable semi-annually. Find the expression for the quarterly instalment upon $1,000, payable in five years.

The sum of the amounts of the several instalments at the end of the five years must equal the amount of $1,000 for 5 years at 12 per cent., the first instalment is invested for $4\tfrac{3}{4}$ years, at 3 per cent. per half year, and therefore at the end of the time will amount to $(1.03)^{9\frac{1}{2}} \times a$ where a is the required instalment. Similarly the second instalment will amount to $(1.03)^9 a$; the third to $(1.03)^{8\frac{1}{2}} a$; &c. Therefore the sum of the amounts of these instalments is

$$\left\{ (1.03)^{9\frac{1}{2}} + (1.03)^9 + (1.03)^{8\frac{1}{2}} + \&c., + (1.03) + (1.03)^{\frac{1}{2}} + 1 \right\} \times a$$

Which is equal to

$$\frac{(1.03)^{10} - 1}{\sqrt{103} - 1} a \quad (1)$$

And the amount of $1,000 for 5 years at 12 per cent. is

$$(1.12)^5 \times 1,000. \quad (2)$$

Equating (1) and (2) we get the value of a

$$= (1.12)^5 \times 1.000 \times \frac{\sqrt{1.03} - 1}{(1.03)^{10} - 1}$$

The solutions to several problems are unavoidably held over, and will appear next month.

BOOK-KEEPING.

Time—One Hour and a-Quarter.

Examiner—J. C. GLASHAN.

1. What is the difference between *Single Entry* and *Double Entry?* What are the advantages of Double Entry?—Value 16.

2. How are the following accounts opened, conducted and closed:—(*a*) Stock, (*b*) Merchandise, (*c*) Bills Payable, (*d*) Interest?—Value 20.

3. What is the order of closing the Ledger?—Value 8.

4. On 4th July, 1881, A. B., of Toronto, gave Y. Z. his note for the $125, payable three months after date. Draw the note so that it may be negotiable *without* endorsement.

What change would make it negotiable only on endorsement?—Value 12.

5. Journalize the following :—Value 24.

(*a*.) I commence business with Cash in the Bank of British North America, $3,000; Mdse., $8,740; a note by A. in favour of O. Q. Y., $400. I also owe M. N. $97.50 on account.

(*b*) Bought Mdse., amounting to $1,300, for which I gave Cash $125, Cheque on the Bank of Commerce for $625, my note at 90 days for balance.

(*c*) Had L. M.'s note for $100, due 1st September, discounted at the Bank of Toronto, net proceeds $98.75.

(*d*) Accepted F. G.'s draft at 10 days for the amount of their invoice of 10th July, $1,724.85.

(*e*) Received a draft on the Ontario Bank for $2,375, net proceeds of legacy left me by C. G. Deposited the amount to my credit.
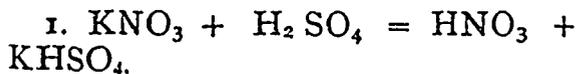
DEPARTMENT OF SCIENCE.

INTERMEDIATE EXAMINATION.

CHEMISTRY.

Time—One Hour and a-Half.

Examiner—E. HAANEL, Ph. Dr.

1. $KNO_3 + H_2SO_4 = HNO_3 + KHSO_4$.

(i). Give, first, the names of the compounds entering into the reaction represented by above equation, and second, the names of the elements, with their combining weights, entering into the constitution of these compounds.—Value 12.

(ii). Represent by diagram, the necessary apparatus for conducting the experiment indicated by the equation.—Value 10.

(iii). What effect would H_2SO_4, HNO_3 and KNO_3, each have upon a solution of blue litmus?—Value 6.

2. It is required to make $3\frac{1}{2}$ pounds of HNO_3 by experiment 1. How much H_2SO_4 is required?—Value 12.

3. Explain the principle of Davy's safety lamp.—Value 8.

4. It is required to prepare the elements hydrogen and nitrogen for class purposes:

(i). Describe the apparatus and name the substances needed for the preparation of each of the elements.—Value 8.

(ii). Write out the equations representing the reactions occurring in their elimination.—Value 5.

(iii). Describe the experiments you would perform to demonstrate their distinguishing properties.—Value 7.

5. Assign reasons for assuming that charcoal, graphite and diamond are different modifications of the same element.—Value 10.

6. Complete the following equations:—Value 10.

$$Ca\,CO_3 + 2\,(HCl) =$$
$$Na + H_2O =$$
$$2\,(NaCl) + 2\,(H_2SO_4) + MnO_2 =$$
$$P_2O_5 + 3\,(H_2O) =$$
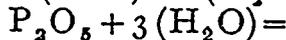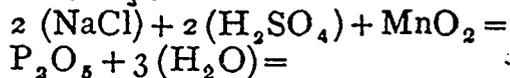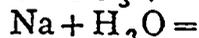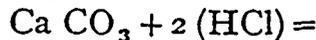
7. Coal gas and phosphorus burn with a luminous sulphur and hydrogen with a non-luminous flame. Account for this difference.—Value 10.

8. A certain quantity of zinc furnished, when treated with sulphuric acid, $3\frac{3}{4}$ pounds of zinc sulphate. How much zinc was employed? $Zn = 65$.—Value 12.

PUBLIC SCHOOL DEPARTMENT.

NORTH WELLINGTON PROMOTION EXAMINATIONS, APRIL, 1881.

First Class—Promotion to Second.

READING.

First Book, Part II, page 74—"Robert grew better—taken more care. Value 30 marks.

WRITING.

Copy on slates in script, page 16—"Pretty, pretty squirrel—I will dine." Value 30 marks.

DICTATION.

PUPILS WILL TAKE SEPARATE SEATS WITH SLATES.

They paid visits to the woods, and the fields, the ducks, geese, fowls, oxen, sheep, and cows to bid them good-bye." "All must hate

a lying tongue." "If thieves or rogues come near, he growls and looks fierce." Seize, breast, captive, pleased, straight, sleigh, watch, friend, light-house.

The above is to be written neatly.

Value 22 marks, with 2 marks off for each error.

ARITHMETIC.
SEPARATE SEATS WITH SLATES.

1. Write figures for one thousand, nine hundred and ninety, six hundred and one, five hundred and forty, six hundred and ten ; and express in Roman numerals the following : eighteen, twenty-nine and forty-four.

2. Write words for 406, 581, 698, 734, 683, 101, 395, L, XLIX, XC.

3. Express in figures with proper signs, one hundred and one dollars and one cent.

Find the sum of $8954634 + 31246 + 4598637 + 2103 + 4956321 + 9 + 17.$

4. From 9612380163204 take 5738679284205.

5. Find the sum of $483.19, $951.84, $510.40, $731.21, and $323.54.

6. A man sold a house and lot for $3765. a horse and carriage for $639 and seven tons of hay for $107. How much did he receive for the whole ?

7. How many pounds of butter in five tubs each weighing 107 pounds? In three tubs, each weighing 75 pounds ?

8. 1203 apples are worth 957 cents, 530 oranges are worth 1895 cents ; how much are both worth ?

9. Find the difference between 5865137267 and 5766248378.

10. Easy problems in Addition and Subtraction :—

$2 + 6 + 8 + 7 + 5 + 9$ are how many ?

$6 + 1 + 7 + 8 + 10 + 12 + 7 + 3$ are how many? etc., etc.

The first nine are to be answered on slates, and the last should be taken orally. Value 100 marks.—10 each.

LITERATURE.

OPEN BOOKS AND ANSWER ORALLY FROM PAGE 34 :—

(1) What was the name of the ship ?
(2) What is meant by " their bark "?
(3) What is meant by " furling the sails "?
(4) What is used in steering a ship ?
(5) What is meant by " would curb the storm "?
(6) What is a "gale "?
(7) What is an " orb of fire "?
(8) What is meant by " surf "?
Value 24 marks.—3 each.

Second Class—Promotion to Third.

READING.

Second Reader, page 164, from "In one of the new settlements," to " with Jack."

Value 30 marks.

WRITING.
ON PAPER.

Name of pupil in full, his age, residence and P. O. address ; and a specimen containing all the capitals and small letters and the ten digits.

Value 30 marks.

DICTATION.
ON PAPER.

Second Reader, page 170 from " Next morning " to " banks of the stream." Pupils are to be told where a sentence ends ; capitals to be counted.

Value 22 marks, with 2 off for each mistake.

ARITHMETIC.

ON PAPER—FULL WORK REQUIRED—NO MARKS UNLESS CORRECT AND WITHOUT CHANGES.

1. Add the following numbers : Three hundred and forty thousand and fifty, five millions nine hundred and twenty-two thousand and nine, seven hundred and four thousand three hundred and four, twenty thousand and five, sixty-five thousand six hundred ; subtract from the sum three hundred and ninety-seven thousand eight hundred and ninety-seven, and write out the answer in words.

dupois Weight," "Long Measure," "Square Measure," "Measure of time ;" and define quotient, dividend, multiplicand, product and addend.

5. How many bales of cloth, each containing 40 pieces, and each piece containing 36 yards, worth $3 a yard, must be given for 120 government bonds worth $108 each?

6. Find the L. C. M. of 9, 11, 18, 15, 21, 22, 42, 36 and 60.

7. Reduce 14ac., 3ro., 11sq. per., 6sq. feet and 108 sq. in. to square inches.

8. A man bought a horse and carriage ; the horse cost $\frac{3}{5}$ as much as the carriage, and both together cost $640 ; what was the cost of the horse ?

9. A man bequeathed $37,000 to his family ; he gave $\frac{1}{4}$ to his wife, $\frac{1}{3}$ to his son, and divided the rest equally among 5 daughters ; how much did each daughter receive ?

10. Add together three dozen, ten score, and a gross ; and take the sum from 10,000.
Value—100 marks.—10 each.

GEOGRAPHY.

1. Bound Wellington and name all the municipalities in the County.

2. Name and give the positions of the nine cities in Ontario.

3. Name all the Canadian rivers flowing into Lake Ontario.

4. What are the boundaries, principal rivers and towns of Ontario.

5. Give the divisions of British North America, with their capitals.

6. Give the states of the Union bordering on the Atlantic.

7. Draw a map of South America, putting in, with names, the oceans, rivers, countries, capes, islands and mountains.

8. What and where are Barrie, Wolfe, Chaleur, Three Rivers, Funday, Quinte, Stratford, Manitoulin and Walkerton?
Value—72 marks.—9 each.

GRAMMAR.

1. Separate into noun part and verb part :
(a.) Shall we try to catch it?
(b.) Far from his native land, stripped of

all resources, he halted at a large village.

(c.) Few and short were the prayers we said.

(d.) Jump ! I'll catch you.

(e.) In my elation at my success so far, I had explained my object to my sister.

(f.) I called my little brother to join us.

2. Tell the parts of speech in the sentence —page 190, III. Reader — commencing " There is already " and ending with " May 1843." Write the words in columns, and opposite each word give the proper part of speech.

3. Define Case, Person, Gender, Adverb, Conjunction, and Interjection.

4. Give the plural of church, fox, glass, button, wife, woman, penny, goose, potato, and wolf.

5. Give the Feminine gender of the following nouns : Bridegroom, lad, prince, boy, emperor, and negro.

Value 100 marks.—3 for each part of 1 ; 2, 1 for each word ; 3, 12 ; 4, 20 ; 5, 12.

HISTORY.

1. Who discovered Canada ? How many voyages did he make ? Mention his principal dicoveries in each.

2. When and by whom was Quebec founded ? What discoveries were made by him in his expeditions against the Indians?

3. When was Quebec first taken by the English ? How long did they hold it ? Why did they withdraw from it ?

4. Give as fully as you can, the particulars of the taking of Quebec by General Wolfe.
Value 72 Marks.—18 each.

COMPOSITION.

1. "Manual Labor." Third Book, page 166. (Teachers are to read the lesson to the candidates, who will thereafter write its substance as much as possible in their own words.)

Correct the following sentences :—
(a.) This book lays on the table.
(b.) Will you learn me my lessons?
(c.) The boys' waistcoat is too large.
(d.) He told him and I.

3. Combine the following statements into sentence :—

The girl wrote a letter. She was a good girl. She wrote the letter to her mother. It was a long letter. She wrote it in the morning. She wrote it on her mother's birthday.

Value 72 marks.—1, 48; 2, 3 for each part; 3, 12.

LITERATURE.

OPEN BOOKS AT PAGE 239, AND ANSWER IN WRITING :—

1. Why is the 13th of October, 1812, a day to be remembered in Canada?

2. Of what would " their portable property consist?"

3. What is the difference between regulars and volunteers?

4. What is meant by " tattoo," and what little garrison is referred to?

5. What have sentinels to do? What opposition was made to the landing of the Americans?

6. Give some account of General Brock.

7. Explain the meaning of infuriated, sharpshooters, intrepid conduct, reinforcement, enemy, militia, foreign aggression, point of the bayonet, and despised slaves.

8. Name the American Commander? Who gained the victory?

Value 72 marks.—1, 7; 2, 7; 3, 7; 4, 8; 5, 8; 6, 9; 7, 18: 8, 8.

Fourth Class Reading—Promotion to Fifth.
READING.

Fourth Reader, page 132 from " They were all satisfied " to " grow wider apart."
Value 30 marks.
WRITING.
To be judged from Copy Books.
Value—20 marks.
SPELLING.
Page 92, from " No river can exhibit " to "romantic halo."
Value—22 marks—2 off for every misspelled word.

ARITHMETIC.

2. Taking a year as 365 days 6 hours, how many years are there in ten million minutes?

2. Divide 69 miles, 7 fur., 39 po., 2 feet by 492.

3. Add together $\frac{1}{2}$, $\frac{3}{4}$, $\frac{4}{5}$, $\frac{4}{5}$, $\frac{5}{6}$, $\frac{6}{7}$, and subtract the result from $100\frac{1}{100}$.

4. What would be the price of $\frac{5}{8}$ of $\frac{6}{7}$ of $\frac{7}{8}$ of a ship, if $\frac{1}{5}$ of $\frac{3}{7}$ of $\frac{2}{11}$ of it cost $68,000?

5. If $\frac{4}{5}$ of a bushel of peaches cost $\$\frac{15}{25}$, what part of a bushel may be bought for $\$\frac{7}{20}$?

6. What is the amount of $1296 for 6 years, 9 months at $8\frac{1}{2}$ per cent?

7. A lady wishes to carpet a floor 15 feet, 9 in. wide and 22ft., 6 in. long with carpeting $\frac{3}{4}$ yard wide; if the carpeting is worth $2.50 per yd., how much will it cost?

8. A pile of wood is $3\frac{1}{2}$ feet wide, $5\frac{1}{4}$ feet high, and 147 feet long; how many cords does it contain?

9. How many turns does a hoop 2 yds., 16 in. in circumference, make in a quarter of a mile?

10. A table 5 feet square, is covered with cents placed in rows; find the value of the cents, each cent being 1 inch in diameter, and none touching more than four others.

Value—100 marks.—10 each.

GRAMMAR.
Analyze:

(*a.*) The buccaneers now *rapidly increased* in strength, *daring* and numbers.

(*b.*) The Spaniards held *them* in such terror that they *usually surrendered* on *coming* to close quarters.

(*c.*) *We* marched *them* into the woods *off* the road, and *having used* them *as* Regulators *were wont to use* such *delinquents,* we set fire to the cabin, *gave* the skins and *implements* to the young *Indian* warrior, and *proceeded,* well pleased, *towards* the *settlement.*

2. Parse the italicised words in the above sentences.

3. Give the plural of grouse, heathen, die, staff, fish, radius, axis, knight-templar, fruit-tree, brother-in-law.

4. What are the past tense and past participle of bite, chide, forbear, sit, speed, stare and take.

5. What is an Infinitive? How many infinitives are there, and what are they called?

6. Correct, giving reasons, any errors in syntax in the following sentences :

(*a.*) When I wrote that letter I had not the pleasure of hearing his sentiments.

(*b.*) The following facts may or have been adduced as reasons.

Value 100 marks.—1, 15 ; 2, 40 ; 3, 11 ; 4, 16 ; 5, 12 ; 6, 6.

GEOGRAPHY.

1. Define water-shed, plateau, table-land, tropic, meridian and prairie.

2. Give the boundaries of Asia and Africa.

3. What and where are Ebro, Frio, Riga, Spartivento, Tigris, Taranto, Natchez, Skeena, Aden, Saluen, Notre Dame, Senegal, Ortegal, Baba, St. Maurice, stating in the case of rivers their direction and where they empty.

4. Over what railroads would you travel, and through what places would you pass in going from Mt. Forest (*a*) to Ottawa? (*b*) to St. Catharines ?

5. Draw a small map of Australia, showing its outline, rivers and mountains.

6. Give the position and extent of the East Indies, with its political divisions, and describe the physical features of British India.

Value 100 marks.—1, 12 ; 2, 12 ; 3, 18 ; 4, 18 ; 5, 18 ; 6, 22.

COMPOSITION.

1. Write one sentence in answer to each question :—

(*a.*) How is paper made ?

(*b.*) Is snow of any use to the farmer ?

(*c.*) What is an earthquake ?

2. Re-write this passage, with proper spelling, punctuation, and capitals where they should be :—

The Europeans were hardly less amazed at the seen now before them every herb and shrub and tree was different from those which flourished in Europe the soil seemed to be rich but bore few marks of cultivation the climate even to the spaniards felt warm and etremely delightful.

3. Write a composition on the " Return of Spring."

4. What is the difference in meaning between

Wales, the noun, and wails, the verb

wave,	"	and wave,	"
waste,	"	and waste,	"
stare,	"	and stare,	"
run,	"	and run,	"
peer,	"	and peer,	"

Value 72 marks.—2 for each part of 1 ; 2, 24 ; 3, 30 ; 4, 12.

HISTORY.

1. Why was the Norman rule hated by the Saxons ?

2. What Saxon kings were most successful in resisting the Danes ?

3. What happened 1002, 1138, 1172, 1215, 1314, 1356, 1485, 1513?

4. What do you know of the Plantagenet period ?

5. State *when*, *where*, and *how* each of the Norman sovereigns died.

6. Describe the conquest of Wales by Edward I.

7. Sketch the character of Wolsey.

8. What was ship-money? Who tested the right of the king to levy ship-money in the courts of law ?

9. What was commonwealth ?

Value 72 marks.—8 each.

LITERATURE.

OPEN BOOKS AT PAGE NINETY-THREE, BUT ALL NOTES ETC. ARE TO BE REMOVED BY THE TEACHER.

1. What city is built on the ancient site of Hochelaga ? Who was the founder of this city and how did it receive its name ?

2. How did the natives receive the name of Indians ? What Indian tribes were found in the Province of Quebec in Cartier's time ?

3. What is meant by " poles and pikes," " stout hearts of their gallant crews," his ascent of the river was prosperous," "abundance of rivers," "the metropolis of the surrounding country," "the name is now lost," "in full dress," and "they were devoted to husbandry and fishing."

4. Give some account of Jacques Cartier.

5. Give the meaning of *discretion, palisades, precaution, gospel, savage* and *civilized.*

Value 72 marks.—1, 12 ; 2, 12 ; 3, 24 ; 4, 12 ; 5, 12.

EDITORIAL NOTES, &c.

FROUDE ON AMERICAN SCHOOLS.—
"I go to school in New England," said
the historian Froude, in a recently
published article, "where the modern
system is developed in its highest
completeness. I see the most admirable arrangements. Ancient languages
and modern science and art, history
and philosophy, poetry and mathematics—nothing is omitted, nothing is
unattempted, and progress is made in
all. * * * * Yet the
experiment has now continued for a
generation or two, and the fruits are
less apparent than they ought to be.
A better education should have produced more vigorous, original thinkers;
a more elevated standard of taste;
information more exact, as well as more
diffused, and nobler principles of
tuition."

We may look down as much as we
please upon the old ideas; they were
in many respects more rational than
those of to-day. In former times, as
but little importance was attached to
mere examinations, there was not much
forcing and cramming, but there was
more real education for all that. A
boy was taught first to be a good man,
and next to do his work, whatever it
might be, as well as it could be done.
It is better that a boy should do the
inferior thing well, than the superior
thing after a middling fashion. The
man who would not rather be a good
shoemaker than a middling author,
would be no honor to the shoemakers,
and certainly no honor to authors.

———

Commissioner Stockwell, of Rhode
Island, advocates the re-arrangement
of the school curriculum of the State;
he says that too much time is given to
the study of Arithmetic and too little
importance attached to the study of
our Language and Literature. There
is a very general concensus of opinion
in Ontario that the time given to the
solution of arithmetical questions is
out of all proportion to the benefits
received, that improbable and fanciful
problems occupy the time of pupils
and masters, to the exclusion of more
useful work, and that this state of
affairs has been brought about largely
by the intimate trade relations which
existed between officers in the employment of the Government and a Toronto
publishing firm. No fewer than three
school officers in the employment of
the Government are directly interested
in the sale of arithmetical text books;
these same gentlemen are also connected editorially with a Toronto
trade journal—a so-called educational periodical, that never ceases to
tout the wares of the firm, however
worthless they may be. One of these
gentlemen is an Inspector of High
Schools, and makes it his business to
see that the schools are kept up to the
proper tension in mathematics; the
other two are connected with the Normal and Model Schools of the Province.
It requires no great amount of acumen
to see that in this educational syndicate there are all the elements of a
thorough book monopoly.

———

It is a costly price that is being paid
for woman's education in our schools,
and a considerable part of it proves to
be a waste. The independent, high-
spirited girl, to whom all careers
lie ready, aspires to what she considers an equality with man, and
demands the same education which is
given to him. She demands more

even, for our boys take the higher courses generally as a preparation for literary or professional work. She takes them merely as a source of ornament and culture. She cannot be expected to realize how little practical benefit they will be to her in domestic life. But in her maturer years many a sensible woman confesses that much of the time and energy expended in securing a *soi-disant* higher education was sadly misapplied. When our girls leave the High Schools, in which they have been thoroughly drilled in the essential branches of learning, unless they have exceptional genius, or aim at work outside of the home, it is a grave question whether their training should not be directed mainly to the acquirement of domestic and social accomplishments. It is in the practice of these that their lives are to be spent, and their own happiness and that of their families will depend upon the manner in which they here acquit themselves. No knowledge can be so important as that which will fit them to be in every sense helpmates to their husbands, wise guardians of children, and competent supervisors of the household. The movement for the elevation and expansion of woman's sphere has been productive of many valuable results, but it has carried the demand for a higher education, as many begin to perceive, to an undesirable extreme. A return to more sober and practical views of woman's training for the province she is in nine cases out of ten destined to occupy, is the thing for which now to strive.

To amplify the High School course of study so as to better adapt it to the requirements of female education, to supplement the instruction given in the Collegiate Institutes by the establishment of a course of lectures, to be delivered by specialists, in Science, Literature and Art, seem to be the best course to pursue, if it is found that there exists a demand for instruction higher than that now given in our best Schools.

———

All physiologists agree as to the tendency of the eager, restless, and anxious modern life to produce an excessive, and extremely complicated and sensitive, nervous development. The result is the increasingly frequent overthrow of mental equilibrium, or, in other words, the growing tendency to insanity, so pitifully illustrated in our lunatic asylums. How to counteract this tendency is the great physiological problem of the age. There is no possibility of slowing down. To go back to the easy-going habits of our ancestors is out of the question. The tendency is manifestly quite in the other direction ; it is predicted that our children's children will look back upon our lives as comparatively serene. Leading physicians and physiologists, and notably Dr. Browne, editor of the *British Medical Journal*, hold that the best of all corrections is to be found in proper physical culture, in patient and systematic training of the muscles and organs of sense. "Muscular exercises," Dr. Browne says, "has been hitherto thought to "expand the lungs, quicken the circu- "lation, and brace the nerves, but to "this must now be added the preg- "nant idea that it also contributes to "brain-growth and mental evolution." "And not only is it possible," as Dr. Browne suggests, "to fortify the young "against the inroads of mental and "nervous disorders by the develop- "ment of brain capacity, stability and "symmetry, through manual training, "but there is gained also, by means of "such training, the additional safe- "guards, which come from much "dealing with realities, from having "always at hand the means of health- "ful recreation, and from the conscious "ability to do, if necessity compels, "something that will win support." Every wise parent will see to it that

his sons and daughters do not grow up to manhood and womanhood destitute of such training in some mechanical art cr technical work as will enable them to go out into life strong in the possession of such "conscious ability."

Our colleges, unlike those of France and Germany, do not instruct a young man in the bread-winning pursuits; they are institutions for general culture. The point for us to note is that the student who has not a special education as a bread-winner is worse off as to his money prospects, than the one who has no college education at all. "Dig he cannot, and to beg he is ashamed." The professions are greatly overcrowded; many doctors and lawyers have to wait years for practice, and many never get into practice at all. In both of these professions there are prizes for a few, and failures, more or less complete, for the many. Upon neither of these, save in favoured and exceptional cases, as where a son succeeds to his father's practice, can a young man depend for fortune, or even for immediate support; they offer sometimes a certain social dignity, but, as a rule, it is the artizan or business man that has the better chance of supporting himself; it is the educated man that has, more frequently, to wait before he can pay his way.

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Mr. T. C. L. Armstrong, M. A., LL. B., Modern Language Master of the Hamilton Collegiate Institute, is now engaged in the practice of Law. It is to be regretted that the teaching profession should lose a member possessing high scholarship and undoubted literary attainments of Mr. Armstrong. As an author he has earned more than a local name. His books are used in almost every school section in Ontario. While identifying himself for several years with the editorial management of the SCHOOL MAGAZINE, he annotated several works in English Literature, among them The Lady of the Lake, Marmion, and a Literature for Public School Teachers; all of which are acknowledged to be a credit to Canadian authorship and a valuable addition to the literature of our Province.

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Mr. James Ratcliffe, late assistant Mathematical Master of the Hamilton Collegiate Institute has gone to Chicago to enter mercantile life there: Mr. Ratcliffe's career as a student was unusually brilliant; after passing successfully the examination for a first class teacher, he entered Toronto University and won the high honor of ranking first in the department of Mathematics at Senior Matriculation and of carrying off the Mathematical Scholarship.

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Mr. N. McKechnie, late assistant Modern Language Master of the Hamilton Collegiate Institute, and formerly a member of the teaching staff of the St. Catharines Collegiate Institute, has accepted an important position in the Canadian Literary Institute, Woodstock.

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In this issue will be found the correspondence between the Principal of a Public School and the Manager of the Ontario Mutual Life Assurance Company. It is needless for us to make any statement regarding the scheme therein discussed, as the subject is so fully and ably explained by the Manager of the Company, that nothing further is required in order to fully understand the whole subject. We are quite sure that the Teachers of Ontario will find that the Superannuated Fund Plan of the Minister of Education cannot afford the advantages offered by the Ontario Mutual Life. During the past few weeks we have received several letters from Teachers, asking our opinion of the stability and soundness of the Ontario Mutual Life. We have fully investi-

gated its plans and its method of doing business, and have no hesitation in pronouncing it the best Life Insurance Company in Canada. The careful, economical way it is managed and the simplicity of its plans recommend it to the Teachers and people of the Dominion. So very careful has been the policy of the management that they have had their plans and management thoroughly examined by the best insurance talent in the country, viz :— Hon. Elizair Wright, of Boston, U. S., Prof. Cherriman, Superintendent of Insurance for Canada, Ottawa, and Sheppard Homans, New York. one of the best, if not the best Actuary in America. These gentlemen have fully endorsed the plans of the Company, and their recommendations and valuations can be procured by applying to the Manager at the Head Office of the Company, Waterloo. The Company's business up to July of this year again doubled over the same period last year, thus showing the popularity and standing of the institution. In a few years it will lead all the Insurance Companies in amount of business. Its soundness and financial strength is undoubted, and nothing has been left undone to give cheap insurance, and at the same time absolute security. It is well fulfilling its Motto: — " The largest amount of insurance for the least possible outlay," and " The greatest benefit to the largest number."

MATRICULATION EXAMINATION, TORONTO UNIVERSITY.

HONOUR LIST.
Arts.

Classics.—Class I.—Logan, Hunter, J. Ross, Vanstone. Class II.—Witton, Haviland, W. H. Hamilton, J. Heber, R. Ross, Baird, Henderson, Mortimer, McDonald, Bannerman, Chisholm, Evans, Mickle, J. Thomson, Webster, Green, Riddell, J. G. Holmes, Irwin, H. E. A. Reid, Dewdney.

Latin Only—Class I.—R. B. Kendrick.

Mathematics — Class I. — R. A. Thompson, Duff, Delurie, Gibbard, Hamilton, J. Heber, Hogarth, M. McPherson, Martin, H. E. A. Reid, Gregg, McMeakin, Sanderson, Tremmear, Vanstone, Baird, Henderson, Hunter, McGarry, R. Ross, W. H. Walker, Small, Stevenson. Class II.— Farrell, Crosby, Irwin, Dewdney, Eshelby, McMurchy, A. Campbell, Hogg, Tolbutt, Kempten, Haviland, W. J. Tremmear, McMaster, Standish, Wells, Ingoll, Holmes, Collins, Farrell, McCall, Martin, Bunbury, Phair, Chisholm, Langley, Wedlake, Barron, Dongan, D. McKay.

English.—Class I.—R. Ross, Heber, J. Hamilton, Martin Kirkman, R. J. Duff, J. Thompson. Class II—Henderson, Gibbard, Gordon, McMurchy, McGeary, Nixon, Langley, W. W. Baldwin, Gormley, Hunter, Stevenson, Boyes, Eastwood, Holme, D. McKay, Vanstone, Webster, Dales, Irwin, Phair, Tolbutt, Brownlee, Gregg, H. E. A. Reid, Shortt, Sykes, Johnstone, McMaster, Stewart, W. H. Walker, Chisholm, Law, A. B. Thompson, Bateman, Farrell, Wilson.

History and Geography—Class I.— Irwin, Kirkman, Sykes, Carroll, Gibbard, Johnstone, McKeand. Class II— J. G. Holmes, H. E. A. Reid, R. Ross, Vickers, Hunter, Vanstone, Kimpton, Shortt, Standish, Robinson, W. H. Walker, A. Bain, Donald, Eastwood, A. B. Thompson, Henderson, McMurchy, Martin, D. McKay, Morphy,

Sanderson, Woodworth, Boyers, Dales, Kyle, Nixon, Tolbutt, Stephenson, Tupper, Chisholm, Gormley, Hogg, W. E. G. Bain, W. W. Baldiom, Fleming, Green, Knox, Wilson, Gregg, H. W. McMaster, H. W. Thompson.

French.—Class I—Nixon and Sykes. Class II.— M. A. Robinson, Langley, H. E. A. Reid, Tupper, Chisholm, Gibbard, Kirkman, Bateman, Hebe, J. Hamilton, Hunter, McKean, Riddell, Vanstone, W. H. Walker.

German.—Class I.—Sykes, Robinson, Hebe, J. Hamilton, Gibbard. Hunter, Martin, Kirkman, Beatty, Langley, Kimpton, Vanstone, Tupper, Ingoll, W. H. Walker, Baird, Johnstone, Nixon, A. B. Thompson, Dales, Holmes, McCollough, Barr, Wedlake, Harley, Tremmear, Class II.—McKean, Woodworth, Farrell, Irwin, D. McKay, W. W. Baldwin, W. Sanderson, Small, Gordon, Hicks, Field, H. W. Thompson, Tolbutt, Bleakley, Vickers, Law.

MEDICINE.

Mathematics.—Class I.— Murray. Class II.—Cane.

English.—Class II.—Donald.

History and Geography.—Class II. Goodall, Murray, Donald.

German—Class I.—Stabler, Donald. Class II.—Goodall.

Chemistry. — Class I. — Murray. Class II.—Goodall.

LADIES' LOCAL EXAMINATIONS.

Mathematics.—Class II.—Symington.

English.—Class II.—Brotherhood, K. Corell, McKitchen.

History and Geography.—Class I. —Brotherhood. Class II.—Hatch McFarlane.

French.—Class II.—Brotherhood. German.—Class II.—McKitchen.

SCHOLARSHIPS.

Classical.—W. M. Logan, Hamilton Collegiate Institute.

Mathematical.—R. A. Thompson, St. Mary's and Hamilton Collegiate Institutes.

Modern Languages.—F. H. Sykes, Toronto Collegiate Institute.

Prince of Wales Scholarship.—G. Hunter, Brantford Collegiate Institute.

First Proficiency.—Heber J. Hamilton, Collingwood Collegiate Institute.

Second Proficiency.—G. Hunter, Brantford Collegiate Institute.

Third Proficiency.—B. S. Vanstone, Lindsay and Bowmanville High Schools.

Fourth Proficiency.—W. H. Walker, Upper Canada College.

A lady Mrs. B Kirkman, stood highest in Modern Languages, but was excluded by the statute which prevents anyone over 23 years of age taking a scholarship.

A MAGNIFICENT DONATION.

At a meeting of the University Senate last evening the following letter was read :—

TORONTO, AUG. 2nd, 1881.

DEAR SIR,—I have much pleasure in enclosing my cheque for $2,000 with which to enable the Senate to found a scholarship in the University of Toronto to be awarded in the Faculty of Arts, on such terms and conditions as the Senate may determine. Without intending to direct the application of proposed scholarship, I take the liberty of suggesting whether it can be advantageously awarded in the department of Greek and Latin classics, and either in addition to or in lieu of any existing scholarship in that department.

I am,
Yours truly,
MARY MULOCK.

To Alfred Baker, M. A.,
Registrar, Toronto University.

At the recent Examinations of Toronto University in Arts, the following places of honor were won by

students from the Hamilton Collegiate Institute:

SECOND YEAR.

1st in Classics—H. R. Fairclough.
1st in Mental and Moral Sciences—W. Farquheuson.
2nd in Mathematics.

FIRST YEAR.

1st in Classics—R. Little.
1st in Mathematics—J. C. Fields.
1st in General Proficiency — J. C. Fields.

2nd in General Proficiency.

JUNIOR MATRICULATION.

1st in Classics—W. Logan.

1st in Mathematics—A. Thompson, (who was a student at St. Mary's Coll. Inst. previous to Sept., 1880).

9 scholarships were won viz: 3 Classical, 3 Mathematical, 1 in Metaphysics, and 2 for General Proficiency. Of these Scholarships, 4 were won by students trained for the Examination in the School.

THE PRESENTATION TO MR. ARMSTRONG.

ADDRESS AND REPLY. — ANOTHER MEDAL FOR THE INSTITUTE.

To T. C. L. Armstrong, M. A., LL. B. :

DEAR SIR,—On the occasion of severing your connection with the Collegiate Institute and with the teaching profession, we take the liberty to express our high appreciation of your work here, and our sincere regret at your departure. During the six years you have spent within these " halls of learning," by your attainments as a scholar and your ability as a teacher, you have won the esteem of all with whom you have come in contact. You can reflect that on leaving the teaching profession your influence has not been, nor will be, circumscribed by the walls of this building. Your devotion to the cause of education in general, and to that of literary culture in particular, as manifested by the labors of your pen, have won for you a more than local—a provincial—reputation. It is to be regretted that though there is no other profession nobler than that of teaching, the inducements it holds out are insufficient to retain the services of men, who, like yourself, are eminently fitted to adorn it. As a more substantial evidence of our good will and esteem for you, we ask the acceptance of this watch and chain, and in conclusion we express our earnest wishes for your future welfare.

Signed on behalf of the teachers, students and ex-students of the Hamilton Collegiate Institute.

<div style="text-align:right">

GEO. DICKSON, M. A.,
W. H. BALLARD, M. A.,
CHAS. ROBERTSON, M. A.,
P. S. CAMPBELL, B. A.,
J. C. FIELDS,
A. McMILLAN,
S. W. McKEOWN,
J. W. H. MILNE.
MISS JENNIE WOOD.
MISS DAISY STEWART.
MISS JENNIE HAMILTON.
MISS MAGGIE RUSSELL.

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THE REPLY.

Mr. Armstrong said :

FELLOW-TEACHERS AND STUDENTS,—I feel completely at a loss for words to express my sense of gratitude for this magnificent present and the kind, but too flattering, terms in the address. In taking farewell of the profession of teaching, it is peculiarly grateful to me to know that I have succeeded in winning an honored place in the esteem of those with whom I have been so long associated, and that when I am absent my name shall be coupled with pleasant memories. My departure from the Collegiate Institute terminates my career as a professional teacher, but will leave unaffected my interest in all that concerns our educational system. Circumstances, and not dislike, have led me to relinquish teaching and to choose other means

of attaining my desired goal. Natural inclination would have induced me to continue "dallying in the primrose path of literature," in that profession whose thankless patron ever forgets her neglected devotees, but whose lofty themes and ardent aims have charmed my life from early youth up to the prime of manhood. Wherever my future lot be cast, whatever walk of life I may follow, the school to me will always be rich with the garnered reminiscences of youth. I feel now as if I were quitting some cool, sequestered grove sacred to divine poesy, and were entering on the long, dusty highway of the weary wayfarer. Many a long, lingering look I shall cast behind on the happy days devoted to culling the immortal flowers and gathering the bright gems that adorn the shady path leading to high Olympus, for such has been my delightful task here; and as time rolls the ceaseless years away and the present becomes the past, the events of these few years, with their clustering thoughts, as they recede in the remote distance of bygone days, will ever send down the dim vista of time an echo to my soul —an elfin echo, sweet and low—a magic horn from the mystic past. Thus, when mellowed by the idealizing touch of memory, my time spent as a master in the Collegiate Institute will be to me a perennial source of delight— a beautiful poem, engraved in golden letters on the tablets of the mind, and rich with the illuminated features of those whom I have learned to respect as scholars, to cherish as friends, and to love and esteem as ingenuous youth. Nor is it the least delight of teachers to know that, while engaged in varied and onerous professional duties, we are making footprints on the sands of time, and that as the sessions roll by, wave after wave, our students come up to us and recede, carrying with them the impress of those footprints to the mighty ocean of eternity. This is noble; this is sublime; this it is that makes our profession inferior only to that which "allures to heaven and leads the way." To my many young friends, whose bright faces I am perhaps looking upon for the last time, I would wish, at the risk of being tedious, to say a few words of encouragement, but shall content myself with again thanking you for your share in this testimonial. Like others I long for your sympathy. Nothing more delights a teacher than the consciousness of having been the means of increasing the happiness of others. Your tribute of approbation of my efforts is sweet to me as are the summer showers to drooping nature. I ask you to overlook my failures; I ask you to forget any harshness that stern duty may have imposed upon me. Whatever my influence may have been upon you, I have ever been conscious that we are all making "echoes"

for each other, whose reverberation shall "go on for ever and for ever." Your influence on me has been a pleasant delusion. When under the control of your bright, happy, joyous spirits, I have been deluded into the belief that I, too, am yet a boy, that my spirits are as elastic, my foot as fleet, my heart as light and my hopes as bright as those of a schoolboy, when life is young and hope is high. I thank you for that charm; in spite of some rude awakenings to the realities of life, I thank you for that delusion; I thank you for surrounding me with an atmosphere of golden imaginations, of honest generous impulses, of high resolve, a charm too often dispelled by the rough struggle of "the madding crowds' ignoble strife." This reminds me of the senior students whom I see before me, about to enter that struggle, and of those absent ones who have already made their first charge. Permit me, a fellow-soldier, to say a few parting words as a common stimulant. Like myself, you are going forth alone to fight the world. Each of you has no doubt resolved, with the poet, to "be a hero in the strife." Yet sorrows may fall and disappointments may come. Many a bright lily of the future will float down the tide of time to pass you a mere empty bubble of the present, and be lost in the idle surf on the strand of the dead past. Hear the poet again:

> Trust no future, howe'er pleasant;
> Let the dead past bury its dead;
> Act, act in the living present,
> Heart within and God o'erhead.

Then with your armor on your breast and your courage at the sticking point you can march boldly to the encounter. Take action as your war cry, but see to it that it is prudent action. Let it neither forfeit the future nor embitter the past. The past is memory's and is long as life; the future is hope's, and is long as eternity; the present only is yours, and is short and fleeting. See that you so employ that present as to give you a future bright with sweet hope, and a past rich with glorious memories. You are yet in youth, enjoying the true poetry of life. Keep the fair muse ever by your side. She and youth inspire you with the lofty resolve to obtain noble ends by noble means. Let this be the constant aim of your efforts in the future, and never sacrifice it on the altar of the present, however imperious or however exacting. Throughout your life be faithful to the shrines of your youth. Preserve its ideals. Amidst the storms and struggles of life, keep them before you as a beacon and strive after them unflinchingly, unswervingly, unceasingly, and all will be well. I will add no more than a reiteration of my sincere thanks for this kindness from my fellow-teachers and my fellow-students—I may call you so, for I have ever been, and

shall probably continue to be, a student. My future calling will not remove from me my studious habits nor my interest in schools and scholars. It would be impossible for me to look with cold neglect on the profession of my youth. Wherever my future calls me, whatever may be my occupation, I will always have for the profession itself an earnest thought, for those engaged in it a deep sympathy, and for the friends I found in it a warm heart.

After the conclusion of Mr. Armstrong's reply, regrets at losing one tone so highly valued as a scholar, teacher and friend were expressed by the following gentlemen: Rev. Mr. Lyle, Geo. Dickson, M. A., W. H. Ballard, M. A., Chas. Robinson, M.A., P. S. Campbell, B. A., and S. McKeown.

Mr. Armstrong thanked them for their very kind remarks and said in parting with them he would offer at the Christmas examinations a medal for the best poem on some Canadian subject, written by a student of the Collegiate Institute, and that he would continue to do this annually as long as he felt able.

COMMUNICATION.

To the Editor of the Hamilton School Magazine.

SIR,—I would ask the favor of being allowed, through the columns of your Magazine, to call the attention of the teaching profession to a scurrilous review of "Cicero Pro Archia," which appeared in the last number of the Educational Monthly.

The introduction, in so far as it describes Cicero's life, is my own composition; in this there is not an error. True, in the first sentence " was " is to be supplied, but this, is an ellipsis, found in the best writings, being more graphic and concise.

The remaining portion (relating to the character and writings of Cicero) consists, verbatim, of passages from Mommsen's, and Merivale's History of Rome; yet this is set down as not being *decent* English.

An Vero.—This is, word for word, § 438 Madvig's Latin Grammar.

The *bald* explanation is *literally* a quotation of Mommsen's History of Rome Vol. I. p. 323 n. It is the teacher's part to see that pupils know what the functions of a consul are.

When I consider that, in all the above cases, due acknowledgment was given to the authors, by inserting the title, and page, of their works from which quotations were taken, I cannot come to a conclusion other than that the intention, from beginning to end, was to misrepresent and malign.

With respect to Sanscrit roots, I would ask the critic to look into the vocabularies of any school classics, published in England, e. g. "White's Grammar School Texts" wherein, although edited for school-boys, Sanscrit roots are given.

It is surprising that the Editor of the Educational Monthly should have inserted such a piece. The philology is the *crudest* imaginable. Crude roots!

Standard dictionaries, e. g. White & Riddle's unabridged, Longmans, Green & Co., 1880, give primary, secondary, and tertiary roots. In a great many instances the primary roots cannot be determined.

Again, the critic spurns: " When the context makes it quite clear *as to what* is meant " ; yet he says : " The Editor has the proper idea *as to what* the character of the notes should be." Critics should not copy diction which they themselves condemn. Further comment is useless. Thanking you for the favor,

I remain yours very truly,

A. L. PARKER.

Collingwood, June, 1881.