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THE SCHOOL MAGAZINE.

MARCH, 1881.

HEALTH DEPARTMENT.

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

THE SCHOLAR'S EYE.

VII.

THE SQUINT.

SQUINT is the in-turning or out-turning of one or both eyeballs. For the most part has its beginning in childhood. The squinting eye has diminished vision invariably where it has lasted for any length of time. The amount of its squint is a rough approximation to the amount of diminution of vision. In old cases of considerable degree there may be useful vision left in that eye when it is considered singly; the other too is, as a rule, diminished in vision, but not to the same extent as both squint and that to an equal degree. The child's vision will practically be that of its best eye; with this "fixes"—a technical term, denoting that the axis of the eye is by an effort of volition directed to the object seen while the other eye is wholly unused, and that quite as much as when we use one hand only, the other being left unemployed. His best eye then may have the vision of two-thirds or less. The

method of measuring vision was explained in the first article of this series on the scholar's eye. He will likewise suffer in getting up his lessons, as he works at a disadvantage. His complaint will be very similar to that of the oversighted pupil already explained. Oversightedness is itself the most common single cause of squint. Where an eye has squinted for a considerable length of time, its cure without surgical operation is not practicable. After operation the vision almost invariably improves. It seldom rises quite to the normal. My experience would go to show that it approximates more nearly to normal if the squint has not been of long standing and where it is of minor degree.

MENTAL TENSION.

For what length of time can children keep the mind intent on a specified subject?

Mr. Chadwick, our best authority, (says the *Boston Medical and Surgical Journal*) concludes that a child from the age of five to seven can attend to one subject for fifteen minutes; from seven

to ten, about twenty minutes; from ten to twelve, about twenty-five minutes; from twelve to sixteen or eighteen, about thirty minutes. The total mental work daily suitable for a young person from twelve to sixteen years of age is placed at from five to six hours.

SANITARY INSPECTION OF SCHOOLS.

At a meeting of the American Public Health Association, held at New Orleans in December last, Dr. H. B. Baker, of Lansing, Mich., Sec. State Board of Health made some remarks on the Sanitary Inspection of Schools, for an account of which we are indebted to the *Canada Health Journal*.

The Sanitary Inspector should be one of the executive officers of the Board of Health, and should act with reference to general cleanliness, and especially with reference to the spread of communicable diseases. In some places it is customary to permit attendance at schools from families where communicable diseases exist, and of convalescents from such diseases, on the certificate of the family physician that it is proper and safe. Sometimes the time which has elapsed since the sickness is made to determine the return to school. I think this should not be permitted, but that the Board of Health, the health officer, or a sanitary inspector of schools, should control this whole subject, and that no convalescent from diphtheria, scarlet fever, etc., should be allowed to return to school except after all his clothing has been thoroughly disinfected, and this without regard to the time which has elapsed since recovery if the time is less than a year.

One great obstacle to progress in dealing with preventable disease in the schools, and out of the schools is the inertia of established usages of the people and of local boards of health. In many places it has long been the custom for the successful political party to appoint a board of health, and to

deny it money and other means for active work; doctors and others have accepted the situation and gone through a certain routine, which often has begun and ended with the abatement of a few nuisances, the making of a report of such feeble efforts, and then giving place to another board composed of new men from the same or from the opposite political party which repeats the same old story. For any effective work for the prevention of diphtheria in the schools, indeed for any effective public health work, it seems essential to have a new system of selecting local boards of health, and a new system of supplying them with the necessary money to carry on their work. Permit me to suggest a plan for the accomplishment of both these purposes as follows:

Let the local board of health to which was entrusted the expenditure of the money and the guardianship of the lives and health of the people of the city be of a kind essentially different from local boards of health heretofore established, let it be not an ephemeral, political body, but a permanent board made a body corporate, and selected and constituted somewhat as follows:—

“The Board to consist of a convenient number of persons (perhaps one or two from each ward), whose terms of office shall be such that not more than half shall go out of office at any one time; nomination to the office of member to be made by ballot at a citizens' caucus of persons belonging to the different political parties, and religiously pledged to the nomination of persons of both political parties in such a way that the Board shall be equally divided politically, thus insuring freedom of the Board, as a whole, from political control; the board to choose its executive officers, whose services should receive sufficient compensation to enable them to do constant and effective work. Such a Board of Health to

prepare the estimates before mentioned, to receive from or order out of the city treasury the funds voted by the citizens and collected by taxation, equally from all classes of people in the city (because all classes are benefited by the maintenance of public health), the Board to be responsible directly to the people for its work, and unable to charge any lack of performance of duty upon any other body of men who might fail to give a Board of Health funds to do its work."

If any one supposes that this plan is fanciful and cannot be put in practice, I can assure him that it can be done and has been done for many years (about twenty-seven or twenty-nine years) with reference to a city Board of Education in Lansing, Mich., and certainly no one will claim that the subject of primary school education is of greater consequence than that of an efficient Board of Health to guard the lives of those for whom the education is provided.

THE TEACHER AND HIS CONSTITUENCY.

By Cliff M. Nichols.

THE public school teacher seems to move apart from men, in a little world by himself. All classes of professional men are isolated from their fellow-citizens, to a certain extent, but he, more than those of other guilds, seems to be kept at arm's length. Yet the work of no class of professionals is more practically important or more nearly affects the interests of the homes in the community or the general welfare of the State than the work of the class of persons who teach in our public schools. Their very state of isolation forces them to act according to their own judgment and on their own responsibility. The attitude of the general public, strangely enough, is that of *quasi-hostility*, while, in the very nature of the relation between the general public and the guild of teachers, it should be of hearty friendliness, co-operation and helpfulness. The average citizen is a critic of the Public Schools, if he prove to be no worse. He wields the sharp-pointed pen as if he wished it were a tomahawk. There is frequent and abundant occasion for

this. There are defects in the Public School system and in its administration, for the simple, obvious reasons that the system itself is of human origin and it must necessarily be applied by human means! The system is devised for the mass of young people in the community, and like all systems devised for the masses, is inflexible and inadequate to meet the necessities of youth in exceptional conditions. When the average citizen discovers that the system does not operate advantageously upon a certain peculiar child—whether his or some other person's—he at once decides that the whole system is wrong and must be abolished. The same is true of this average citizen when he discovers that a certain teacher, out of scores or hundreds, is incompetent or unfit or that all teachers are in some respects faulty, as the conduct of the critic, in this instance, proves him to be. Hence the attitude of *quasi-hostility* on the part of the public toward the fraternity of teachers. Hence the isolation of teachers.

It must be admitted that the Public School system is inflexible, as at present organized. It is true that there is more or less incompetence on the part of teachers. What then? Is not this true of all systems intended for general application and of all persons who attempt to administer them? Yet is not the system immensely better than nothing? Is it not indispensable? Can the keenest critic devise a substitute? We think not.

Let the general public understand, once for all, that we have no more intelligent, keen, bright, practical profession in the community than the fraternity of teachers! Is the system unadaptable to individual cases? No one ascertains the fact quite so soon as the teacher himself. And no one is quite so ready to apply an exceptional remedy to an exceptional case as the teacher whose very proximity gives him even a better opportunity than is enjoyed by the child's parent to discover a need of it. It is true, also, that teachers as a class, are rather better informed of their own defects than the persons who criticize them. The general public rants about them, but the average teacher mourns over them and tries to remedy them. Hence these conventions of teachers, with annual, semi-annual, or quarterly sessions. By whom are teachers as a class or the system itself more severely criticized than in the discussions of these gatherings—or more intelligently or by more competent persons? The critic who drops into these conventions finds himself a child. His immense knowledge in the way of defects and failures in teaching proves to be ignorance itself.

The most important educational need of the times is that the teacher and his constituency should be brought together, face to face, and brought into friendly, harmonious relations. The teacher needs the co-operation and aid not simply of the parent and

guardian, but of the general public. If he does his work well, to the best possible advantage, he does not serve the parent alone, but the entire community. One good, intelligent, honest, faithful, devoted teacher does more for the community in which he lives and for society than a whole police force can do. He does more for the protection of the citizen and of his property from molestation or outrage. One public school teacher who is faithful in discharging his professional obligations, is doing more for the country and its present and future welfare than a thousand professional politicians. Who does not know this? It follows, then, that the general public—the people of the community in mass—should be the fast friends and the earnest, industrious helpers of the fraternity of teachers. They should consult them—not *in*-sult them—associate with them, talk with them, ascertain their most pressing needs, and do what they can, individually and in a general way, to meet them.

We must give our people some credit for doing something in the way of school visitation, but they should do more of it; we must give them credit for kind feelings towards the schools, but it should find more frequent expression. The critic fires himself off and makes himself known, but the person who has no fault to find has nothing to say—and says it. We are well aware that the masses are proud of the public schools, but this pride and general interest are only manifested once a year, at commencements. These manifestations should be oftener made, to the encouragement and strengthening of the teacher, who has a right to criticize his critics for their shortcomings. Yet, with full justification and right, he is wiser than to do it. He usually suffers in silence and strives to attain a general state of personal and professional excellence that will place him beyond the reach of

the critic's shafts. We may say that this is true of teachers as a class—not of all of them. There are persons in the profession who ought not to be in it. Teachers who are unfit for their work should be weeded out, and from year to year they leave the profession as their incompetency is discovered by superintendents, principals, and Educational Boards. But those who stand the test of service should not

only be well paid in current coin of the country, but should receive that which is of even more value, the hearty esteem, the friendly social recognition and earnest practical co-operation of their fellow-citizens. Under these conditions would not all teachers reach higher and better results? Could not all do their work better in these favoring circumstances? Who doubts that they would?

ADDISON'S STYLE

In Sir Roger de Coverley Papers.

We purpose in the course of this paper to give some notes or hints upon the best or most convenient method of treating of an author's style. Those who require fuller explanation will find it in Professor Bain's "English Composition and Rhetoric," and in Mr. Minto's excellent "Manual of English Prose Composition," a work which is founded on Professor Bain's.

Style according to Professor Bain, embraces the following topics:—I. The *Figure of Speech*, and the consideration of the *Number* and the *Order of Words*. II.—The explanation of the various *Attributes* or *Qualities of Style*. III.—The *Sentence* and the *Paragraph*. We intend to examine some of the more prominent features of Addison's Style under the above-mentioned heads.

I, Figures of Speech. With reference to Addison's use of Figures of Speech in the Sir Roger de Coverley Papers, his style can be termed neither florid nor bald. Much of the grace and ease of Addison's style is due to the fact that his language closely approximates to the conversation of the polished society of his time. The language of conversation never abounds in the use of figures, and thus we find that figures are not very frequently in-

troduced, but those figures that are occasionally employed, have for this reason a more pleasing and exhilarating effect. His figures are neither elaborate nor far-fetched—the most elaborate, perhaps, is found in the second paragraph of the tenth paper, where the figure of Comparison runs through the whole paragraph.

Diction.—Under this head we may consider not only the number and order of words, but also the choice of words. In Addison's critical works he is thought to have shown rather an inferior power in varying his expressions, but in his *Spectator Papers* his diction is noticeably apt and varied. He avoids the ponderous Latin polysyllables in which writers of his time delighted, and his style is eminently Saxon. With reference to the number of words his style is diffuse, the result of its approaching so nearly the language of conversation. The order of words will be considered in the Sentence.

Sentences.—Prof. Bain has given a singularly apt illustration of the proper position or order of words in a sentence:—"As, in an army on the march, the fighting columns are placed front and rear, and the baggage in the centre, so the emphatic parts of a sentence should be found either in the

beginning or in the end, subordinate and matter-of-course expressions in the middle." It would occupy too much space here to define the various kinds of sentences—the student will find them fully explained in Bain or Minto. Addison employs almost exclusively the loose sentence. From his languid temperament he avoids making the effort necessary to the construction of periodic or antithetical sentences. The loose sentence moreover was well suited to his taste for melody and simplicity in style. From an ostentation of ease he sometimes misplaces his clauses—for example, in the Third Paper, notice the displacement of the clause, "Upon the death of his mother," in the sentence, "The knight seeing his habitation reduced, &c." From the same cause, notice the ambiguity of the clause, "Because it seems he was but nine years old when his dog killed him," in the second paragraph of the Eighth Paper.

Qualities of Style, Simplicity.—This is one of the most prominent features of Addison's prose style. DeQuincy has animadverted severely on Addison's superficiality. Addison was obliged to be superficial from the end he had in view. The object of the *Spectator Papers* was proclaimed to be the bringing of "Philosophy out of closets and libraries, schools and colleges to dwell in clubs and assemblies, at tea-tables and coffee-houses." The simplicity of his style rendered this philosophy more acceptable to unlearned readers. Dr. Johnson remarks on Addison's style: "His prose is the model of the middle style; on grave subjects not formal, on light occasions not grovelling, pure without scrupulosity, and exact without apparent elaboration; always equable, always easy, without glowing words or pointed sentences. Addison never deviates from his track to snatch a grace, he seeks no ambitious ornaments, and tries no hazardous innovations."

Clearness.—We have already seen that from an affectation of polite ease his meaning is sometimes ambiguous, and another cause of weakness in this respect, is that he does not make any great use of contrast in order to define his views the more accurately. This defect is not noticeable to any appreciable extent in the Sir Roger de Coverley Papers, where his language is in general felicitous, and his ideas readily apprehended.

Strength.—From what has been said already, it will be clearly seen that strength is not one of the characteristics of Addison's style. "It is always equable, always easy," as Dr. Johnson remarks. From his language resembling that of polite conversation, and from its diffuseness, the truth of the above estimate is readily seen.

Pathos.—Addison's command of this quality is seen to advantage in the last paper, where he describes the death of Sir Roger de Coverley. Pathos is but another name for the tender emotion that is produced by the recital or verbal representation of touching events. "The stimulents of the tender feelings are," according to Bain, "objects of special affection, displays of active goodness, humane sentiments, pain and misery and pleasure, especially such as are gentle rather than active. In highly pathetic situations the modes are combined." Death with mysterious fascination calls forth tender emotion, as shown by Gray's Elogy. We may notice some of the sources of pathos in the last of the Sir Roger de Coverley Papers. The death of a friend excites tender feelings within us. We learn then with emotion of the death of Sir Roger, whose society has afforded us so much pleasure. This effect is heightened by the delicate strokes of the author's invention, the homely simplicity of the butler's letter, the references to Sir Roger's consideration for his servants, the innate geniality of

his heart, the lamentation of the poor, and the sympathetic grief of the Club, with many other little touches, designed to wake this feeling, which cannot be enumerated here. The delicacy of Addison's pathos is as noticeable as the delicacy of his humour. He does not dwell, for example, on any of the harrowing incidents that accompany death.

The Ludicrous.—"He is the great English example of polite ridicule. The poignancy of his sarcasm is so disguised and softened by elegance of language, ingenuity of wit, and affectation of kindness, that he is often pointed out as a crowning instance of amiable humour." Mr. Minto is of the opinion, however, that not a single paper can be pointed out that does not contain some stroke of malice, that the character of Sir Roger De Coverley, is really a caricature of rusticity. As a motive for this it has been pointed out that Addison was a Whig and that the chief supporters of the Tory party were the Country Squires. Yet it must be conceded that if Addison meant to be satirical, if he meant to bring Sir Roger into general contempt by the malicious exposure of his weaknesses, he would scarcely have invested him with so many good qualities of head and heart, that despite his eccentricities he wins our esteem. We would not therefore feel inclined to give so much prominence to the malicious element in his humour. It may be further remarked that his ridicule is never aimed at individuals but at classes, and as Tickell observes he employed wit on the side of virtue and religion.

Melody.—Addison has devoted great attention to Melody, many of his defects in clearness are attributed to his great regard for this quality of style. Johnson remarks that he avoids, "all harshness and severity of diction; he is therefore sometimes verbose in his transitions and connections, and sometimes descends too much to the

language of conversation." In connection with this subject, the student can study Prof. Bain's rules for Melody.

We have thus presented to the reader a detailed though brief analysis of Addison's style. No claim is made for originality of treatment; our only aim being to introduce to the students of English Literature a philosophical method of analyzing an author's style. In the majority of English text-books on the Subject, heretofore, an author's style has been despatched with a few vague generalities that exact little exertion from the editor, and impart little information to the reader.

QUESTIONS IN ENGLISH ANSWERED.

The following questions in English Grammar have been received from subscribers, the first two from a correspondent at Fork's Road.—We have answered them briefly as possible.

1. When does the verb "will" take the infinitive after it without the preposition *to*?

Ans.—When it is used as an auxiliary of tense.

2. Explain why "Mason" in the sentences, "I will not obey," and "A reader will probably undervalue, &c.," regards 'will obey' as a complex, and 'will undervalue' as a simple predicate; or in other words why he considers 'will' in the first sentence as a verb of incomplete predication, and in the last, as a part of the simple predicate.

Ans.—The verb 'will' has not exactly the same force in the second and third persons that it has in the first. We cannot make so strong an assertion respecting the attention of another, as we can respecting our own. Hence some grammarians would say that 'will obey' gives an idea of absolute futurity, and 'will undervalue' of simple futurity; or in other words the verb 'will' in the last sentence is a mere auxiliary of

the future tense, and in the first, though used as an auxiliary, it retains more of its original meaning. The reason why Mr. Mason, treats 'will undervalue' as a simple predicate is, because it would be inconsistent to treat the present tense of the verb as a simple predicate, and the future as a complex predicate.

3. Parse the italicised words:—

(a) The brightest jewel in the *Queen* of *England's* crown.

(b) I saw a dog *running* across the field.

(c) I *had as lief* not *be*, as live to be in awe of such a thing as I *myself*.

Queen is a common noun, of the feminine gender, of the singular number, and in the possessive case depending on the noun *crown*.

England is a proper noun, of the neuter gender, singular number, and in the objective case governed by the preposition *to*.

Running is the imperfect active participle of the verb run, qualifying the noun *dog*.

For full explanation of the third sentence refer to foot note on page 200 of Mason Grammar. Mr. Mason, here parses 'had' as in the subjunctive mood, 'lief' its complementary adjective, and 'be' as a dependant infinitive to the object of 'had.'

Myself is a reflexive pronoun of the first person, mas. or fem. gender, singular number, and in the nominative case, apposition with the pronoun I.

4. Why is it that although the English language has derived many words from the Latin, it is not a Romance language?

Ans.—1. Because the great majority of words in use are Saxon. 2. Because its grammar is purely Saxon. Fuller information can be obtained in almost any text-book on the subject.

MATHEMATICS.

Toronto University,—Pass Algebra, 1859.

1. State the laws which obtain in the combinations of algebraical symbols.

In what sense is the symbol a^b to be interpreted when a and b are not whole numbers?

If the index law had been assumed to be

$$a^x b^x = (a + b)^x$$

we should have had

$$a^n = (a + n)^x = n^x$$

What, in this system, would have been the interpretation of the symbols a^1 , 0^a ?

2. Every square number is either divisible by 3 or becomes so by the addition of 2; and the product of any three consecutive integers, the middle one of which is odd is divisible by 24.

3. Prove

$$n \overline{n+1}^2 - (n-1 \overline{n})^2 = 4n^3$$

and find the value of

$$\frac{(a+b+1)(x^2+1)}{(xy+1)(a^2+1)} - \frac{x+1}{y+1}$$

When $x = \frac{1+a}{1-a}$ and $y = \frac{1+b}{1-b}$

4. Describe Horner's method of synthetic division. Divide

$$7x^5 + 21x^4y + 35x^3y^2 + 35x^2y^3 + 21xy^4 + 7y^5$$

by $x+y$ and the quotient by x^2+xy+y^2 .

Explain how this method may be employed to find the value of an integral function of x when a value a is substituted herein for x . For example, required the value, when

$$x = -12, \text{ of}$$

$$x^5 + 5x^4 - 88x^3 - 40x^2 - 151.$$

5. Investigate a rule for finding the highest

common divisor of two algebraic polynomials and prove this divisor to be the lowest common multiple of all the common divisors.

Find the H. C. D. of

$$18x^4 + 9x^3 - 17x^2 - 4x + 4;$$

$$8x^4 + 4x^3 - 6x^2 - x + 1;$$

and resolve these quantities into simple factors.

6. Reduce to a single fraction

$$\frac{3}{4(1-x)} + \frac{3}{8(1-x)} + \frac{1}{8(1+x)} - \frac{1-x}{4(1+x^2)}$$

7. What is the distinction between an equation and an identity?

To which class, having regard to x , does the following belong :

$$\left(x + \frac{5a}{2}\right) \left(x - \frac{3a}{2}\right) + ax.$$

$$= (x+5a)(x-3a) + 11\frac{1}{2}?$$

If $a = 1$, how then?

8. Find the Arithmetic, Geometric and Harmonic means between two quantities.

If a, b, c , be in Harmonic progression, then

$$\text{will } \frac{ab}{a+b}, \frac{ac}{a+c}, \frac{bc}{b+c}, \text{ be in H. P.}$$

$$\text{and } \frac{b+c}{a}, \frac{c+a}{b}, \frac{a+b}{c}, \text{ in A. P.}$$

9. If a varies as b and c varies as d , then will ad vary as bc .

There are two circles each of radius 3 and four others of radii 4, 5, 6, 7, respectively, show that they can all be made up into a single circle of radius 12, assuming that the area of a circle varies as the square of its radius.

10. Given the first and last of a given number of quantities in arithmetical progression, find their sum.

Find a series where, the first term being 11, the sum of the first three terms is equal to that of the first nine terms.

11. Given any two terms of a geometric series, show how to construct it.

Find a series where the first term is 3, the fifth term $\frac{16}{27}$, and the sum of the first five terms $2\frac{1}{3}$.

12. Find the limit of the sum of a geometric series indefinitely extended, the common ratio being less than unity.

Deduce the ordinary arithmetic rule for finding the value of a recurring decimal.

$$\text{Prove that } \sqrt{1.77} = 1.33.$$

13. The latter half of $2n$ terms of an arithmetic series is one-third of the sum of $3n$ terms of the same series.

If a denote the sum of n terms of $1 + 5 + 9 + \dots$, and b the sum of $3 + 7 + 11 + \dots$ to $n-1$ or n terms then will $a+b = (a-b)^2$.

The fraction $\frac{1}{81}$ on being converted to a decimal will continually produce successively in order the digits 0 to 9 with the exception of 8. Explain this.

14. How are equations divided into orders?

Prove that every equation in x involving x^2 and no higher power of x , has two and only two roots.

Prove that the roots of $ax^2 - bx = a^2x - ab$ are rational.

15. Solve the equations

$$(1.) (a+x)(b+x) = nab.$$

$$(2.) 1 + \sqrt{x} = 6x.$$

$$(3.) \sqrt{x} + \sqrt{x-1} = \sqrt{x+1}.$$

$$(4.) x+y+z = \frac{a^3}{x} = \frac{b^2}{y} = \frac{c^2}{z}.$$

NATURAL PHILOSOPHY.

London University Matriculation.

STATICS,

1. Squares are described upon the three sides of an isosceles right angled triangle.

—Determine the centre of gravity of the complete figure so formed.

2. It is asserted that if a substance be weighed successively from the two ends of a false balance, its true weight will equal the square root of the product of the two apparent weights.—Prove this.

3. A heavy uniform beam AB is supported at C by a vertical prop CD, its extremity A pressing against a wall.—Determine the condition of equilibrium, taking no account of friction.

4. Show that when five forces acting at a point are capable of being represented in magnitude and direction by the sides of a pentagon, taken in order they are in equilibrium.

5. Explain the resolution of forces in the case of a ship sailing at right angles to the wind, exhibiting also the force that causes lee-way.

6. Three cords are tied together at a point; one of them is pulled in a northerly direction by a force of 6 lbs., and another in an easterly direction with a force of 8 lbs. With what force must the third be pulled to keep the whole at rest?

DYNAMICS.

1. A body projected vertically upwards against gravity has risen 120 feet in one second. What was its initial velocity of projection, and how far will it rise during the next second?

2. Two masses of 48 and 50 grammes respectively, are attached to the string of an Atwood's machine, and, starting from rest, the larger mass passes through 10 centimetres in one second. Determine from these data the value of the acceleration due to gravity, your units being centimetres and seconds.

3. What is meant by saying, with reference to gravity, $g = 32$? What would be the value of g if your units of space and time were miles and hours?

4. A stone projected vertically upwards

reaches the ground again in 6 seconds. What was its height above the ground at the end of the first second?—($g = 32$).

5. A stone is thrown into the air at an angle of 45° to the horizon, with a velocity of 128 feet per second. Show that the path of the stone will not be a straight line; and determine the amount of vertical deviation from a straight line at the end of two seconds, neglecting the resistance of the air.—($g = 32$).

6. How do we know that the weight of a body differs in various parts of the world?—Explain the cause of this variation.

ANSWERS TO PROBLEMS FROM CORRESPONDENTS.

1. If the roots of

$$x^2 + px + q = 0 \quad (1)$$

$$x^2 + qx + p = 0 \quad (2)$$

differ by the same quantity, show that

$$p + q + 4 = 0.$$

Let a and b be the roots of (1); then $a + b = -p$, $ab = q$.

Let $a + c$, $b + c$ be the roots of (2); then $a + c + b + c = -q$ (3).

$$(a + c)(b + c) = p.$$

$$\therefore c^2 + (a + b)c + ab = p.$$

$$\therefore c^2 - pc + q = p.$$

$$\therefore c^2 - pc = p - q. \quad (4)$$

But from (3) $2c = -a - b - q = p - q$.

\therefore (4) becomes

$$\left(\frac{p - q}{2}\right)^2 - p \frac{p - q}{2} = p - q.$$

\therefore dividing by $p - q$ we have

$$p + q + 4 = 0.$$

$$2. \text{ If } \frac{bx + ay - cz}{a^2 + b^2} = \frac{cy + bz - ax}{b^2 + c^2}$$

$$= \frac{az + cx - by}{c^2 + c^2} \text{ show that}$$

$$\frac{x + y + z}{a + b + c} = \frac{ax + by + cz}{ab + bc + ca}$$

$$= \frac{a(bx + ay - cz) + b(cy + bz - ax)}{a(a^2 + b^2) + b(b^2 + c^2)}$$

$$\text{Each fraction} = \frac{a(bx + ay - cz) + b(cy + bz - ax)}{a(a^2 + b^2) + b(b^2 + c^2)}$$

$$= \frac{y(a^2 + bc) + z(b^2 - ca)}{a^3 + b^3 + ab^2 + bc^2} \quad (1)$$

Similarly
$$\frac{y(c^2 - ab) + z(a^2 + bc)}{c^3 + a^3 + c^2a + b^2c} \quad (1)$$

Equating (1) and (2) we get

$$a(a+b)(a^3 + b^3 + c^3 + abc)y = a(c+a)(a^3 + b^3 + c^3 + abc)z$$

$$\therefore \frac{y}{c+a} = \frac{z}{a+b} = \frac{x}{b+c}$$

and each of these

$$= \frac{x+y+z}{2(a+b+c)}$$

also

$$= \frac{ax + by + cz}{a(b+c) + b(c+a) + c(a+b)} = \frac{ax + by + cz}{2(ab + bc + ca)}$$

APHORISMS OF PESTALOZZI.

The mode of familiarizing a child with the habit of thinking on what he sees, and speaking after he has thought, is not to talk much to, but to enter into conversation with him.

Not to address to him many words, but to bring him to express himself on the subject.

Not to exhaust the subject, but to question the child about it, and let him find out and correct the answers.

The attention of a child is deadened by long expositions, but roused by animated questions.

Let the questions be short, clear and intelligible.

Let them excite the child to observe what is before him; to recollect what he has learned; to muster his little stock of knowledge for materials for an answer.

Show him a certain quality in one thing, and let him find out the same in others.

Tell him that the shape of a ball is called round.

If you bring him to point out other

objects to which the same predicament belongs, you have employed him more usefully than by the most perfect discourse on rotundity.

In the one instance he would have had to listen and to recollect; in the other he has to observe and to think.

When I recommend to a mother to avoid wearying her child by her instructions, I do not wish to encourage the notion that instruction should always take the character of amusement, or even of a play.

A child must, very early in life, be taught that exertion is indispensable for the attainment of knowledge.

But a child should not be taught to look upon exertion as an evil.

The motive of fear should not be made a stimulus; it will destroy interest and speedily create disgust.

Interest in study is the first thing which a teacher, a mother, should endeavor to excite and keep alive.

There are scarcely any circumstances in which a want of application in children does not proceed from a want of interest.

SCIENCE DEPARTMENT.

THE METALS OF THE ALKALIES—By C. A. Fleming.

CHARACTERISTICS OF THE GROUP.—They are lighter than water—decompose water—are highly oxidizable—have a silver white, metallic lustre—are monads. The Hydroxides, Sulphides, Carbonates and Phosphates are readily soluble in water. The first three restore the blue color to *Litmus* reddened by an acid, thereby showing strong alkaline properties.

POTASSIUM.

I.—SYMBOL K, Comb. Wt., 39.1.

II.—OCCURRENCE.

- (a.) Combined in the *Felspar* of granitic rocks. There is no easy way of separating the Potassium from the Silica (SiO_2) of the *Felspar*. Plants effect what we cannot.
- (b.) Combined as *Potassium Nitrate* (KNO_3) occurs as an efflorescence on the soil in tropical climates—*India*.
- (c.) *Potassium Chloride* (KCl) occurs in sea water, also in salt beds with rock salt in Stassfurt and other places.

III.—PREPARATION.

- (a.) Sir Humphrey Davy decomposed the Hydroxide HKO into the metal, Oxygen and Hydrogen, by means of electricity.
- (b.) Plants are burnt and the ashes leached. This solution is evaporated, and crude Potassium Carbonate obtained (Potash.) This is purified by crystallization, and is then $\text{K}_2\text{CO}_3 = \text{Pearl Ashes}$. The Carbonate and Carbon are heated to a high temperature in an iron retort. The C will take the O from the K_2CO_3 and pass off as Carbon Monoxide, CO, while the K, which is volatile at a red heat, distills over and is cooled in *naphtha*. To free this from a black explosive compound it is distilled a second time, $\text{K}_2\text{CO}_3 + \text{C}_2 = \text{K}_2 + 3\text{CO}$.

SODIUM.

Na. Comb. wt. 23.

- (a) Combined in primitive granitic rocks.
- (b) In every speck of dirt.
- (c) In sea water as Sodium Chloride NaCl . Rock Salt is pure NaCl .
- (d) Sodium Nitrate NaNO_3 occurs in large beds in Chili.

Same.

Prepared from the Carbonate Na_2CO_3 by a like process.

AMMONIUM.

(NH_4). Comb. wt. 8.5. (A Quasi-metal.)

Will not exist in a free state.

IV.—PROPERTIES.

A bright silver white metal—easily cut with a knife—brittle at 0°C—melts at 62.5—sublimes at a low red heat, forming a green vapor—tarnishes in air—burns on water with a purple flame, evolving H and dissolving into a *bitter caustic*, alkaline solution of Hydroxide = $H_2O + K_2 = 2HKO$.

Difference—melts at 95.6° C.

In most chemical reactions NH_4 acts like K or Na. Not so in what has been called its amalgam with Sodium and Mercury. The swelling of the substance is produced by the decomposition of NH_4 into NH_3 and H. These gases may be pressed out by mechanical means.

V.—COMPOUNDS.

(a.) Oxides. $\left\{ \begin{array}{l} K_2O.—Expose\ thin\ strips\ of\ K\ to\ the\ air. \\ A\ greyish\ white\ brittle\ substance,\ K_2O,\ is \\ K_3O_4.—Heat\ K\ to\ a\ high\ temperature\ in \\ air;\ K_2O_4\ is\ formed. \end{array} \right.$

Same.

Na_2O_3 heat Sodium in Oxygen to 200 C.

(b.) *Hydride* HKO .—1. Potassium and water $K_2 + 2H_2O = H_2 + 2HKO$.

Same.

2. Potassium Oxide and water $K_2O + H_2O = 2HKO$.

Same.

3. Boil one part Potassium Carbonate K_2CO_3 in 12 H_2O with slacked lime $Ca(OH)_2$ and Calcium Carbonate will be precipitated, and Potassium Hydroxide (caustic potash) remains in solution. This liquid should not effervesce (No CO_2) on addition of an acid. Should be evaporated in a *silver* basin and cast into sticks.

Same.

Ammonia + water $NH_3 + H_2O = (NH_4)HO$; ammonium Hydrate is formed.

COMPOUNDS.—Continued.

(c.) *Carbonate* K_2CO_3 .—1. Prepared from the ashes of plants. (See Sec. III, preparation.)
2. If *Potassium Tartrate* $K_2C_4H_4O_6$ be heated, pure *Potassium Carbonate* is formed. The O, H & C pass off as *Hydro Carbons* and *Oxides*.

(d.) *Bi-carbonate* $HKCO_3$. Pass a current of CO_2 into a strong sol. of K_3CO_3 . A nearly neutral solution of *bi-carbonate* is formed. $K_2CO_3 + CO_2 + H_2O = 2HKCO_3$.

(e.) *Nitrate* KNO_3 .—1. An efflorescence on the soil in India.

2. Artificially formed by nitrification process. Animal matter (containing Nitrogen) is mixed with wood ashes (containing K) and lime, and exposed to the action of the air. (a) Nitric Acid HNO_3 is formed; then (b) KNO_3 and $Ca(NO_3)_2$ are formed; (c) boil the mixture with *Potassium Carbonate* and $CaCO_3$ is precipitated and the KNO_3 solution is evaporated and crystallized.—Soluble in 7 pts. H_2O at $15^\circ C$.

Na_2CO_3 is prepared from *Sodium Chloride NaCl* by two processes.

1. *Salt Cake process*.— $2NaCl + H_2SO_4 = Na_2SO_4 + 2HCl$.

The salt and H_2SO_4 are heated in a furnace; the K_2SO_4 is called *Salt Cake*.

2. *Black Ash process*.—Heat the *Sulphate with Charcoal*— $Na_2SO_4 + 2C = Na_2S + 4CO$. The CO passes off as a gas.

$CaCO_3$ is introduced and more heat applied. The substance formed is leached, the solution evaporated and cast into sticks.

$HNaCO_3$ same. Used in medicine and in making effervescing drinks.

$NaNO_3$ (*Chili Saltpetre*) is found in large beds in Chili. Used in the manufacture of HNO_3 and KNO_3 thus: (a) $2NaNO_3 + 2H_2SO_4 = 2HNO_3 + Na_2SO_4$ (b) $NaNO_3 + KCl = NaCl + HNO_3$

$(NH_4)_2CO_3$ —prepared by adding *Ammonia* to an acid salt—is very unstable in contact with air or in vessels not air tight by the evolution of *Ammonia* and the absorption of water and *Carbonic Acid*, forming the *Bi-carbonate* $H(NH_4)CO_3$. The *Sal-volatile* of commerce, prepared by heating a mixture of $2NH_4Cl$ and $CaCO_3$ ($2NH_4Cl + CaCO_3 = CaCl_2 + (NH_4)_2CO_3$ (volatile) is the half acid *Carbonate* $(NH_4)_4H_2(CO_3)$ united with *Carbonate* $CO\{ONH_4\} + H_2O$.

This likewise passes into the *Bi-carbonate* which is isomorphous with $HKCO_3$ and occurs in *Guano*.

$(NH_4)NO_3$ *Ammonium Nitrate*, formed by acting on *Ammonia* with *Nitric Acid* $NH_3 + HNO_3 = (NH_4)NO_3$,—is soluble in H_2O —crystallizes in transparent needles.

COMPOUNDS—Continued.

(f.) *Chloride* KCl. Occurs in saline deposits in Stassfurt and in sea water. It crystallizes in cubes—is used in the preparation of other Potassium salts.

(g.) *Chlorate* KClO₃. If Chlorine be passed into a hot solution of HKO Potassium Chlorate and Chloride are formed. $6 \text{ KOH} + 3 \text{ Cl}_2 = \text{KClO}_3 + 5 \text{ KCl} + 3 \text{ H}_2$

(h.) *Sulphate* K₂SO₄. This substance is contained in sea and land plants—may be extracted from the ashes of them; only slightly sol. in H₂O.

(i.) *Bi-sulphate* HK SO₄, obtained in the manufacture of Nitric Acid $\text{KNO}_3 + \text{H}_2\text{SO}_4 = \text{HK SO}_4 + \text{HNO}_3$.

Sulphides K₂S, K₂S₂, K₂S₃ and K₂S₅. They are soluble, and all except the first, give off Sulphuretted Hydrogen when heated.

NaCl Sodium Chloride (common salt) occurs in sea water and in beds in Gallacia, Cheshire, &c.

Na₂SO₄ formed in Salt Cake process above.

Same.

Na₂S, formed in Black Ash process above.

NH₄Cl Ammonium Chloride. This is formed by acting on the amm'l. liquor of gas works with HCl. Crystallizes—volatilizes without melting.

(NH₄)₂SO₄ obtained as above. Use H₂SO₄ instead of HCl. Employed in making alum and as a manure.

(NH₄)₂S. This is formed when a mixture of Ammonia and H₂S is subjected to -18° C. Crystallizes, but loses NH₃ when heated. The Ammonium Sulphide of the laboratory is obtained by saturating Aqueous Ammonia with Sulphuretted Hydrogen—yellow color due to the formation of Polysulphides of Ammonia and water. Phosphates.—Three are formed, (NH₄)₃PO₄ (NH₄)₂HPO₄ & (NH₄)₂PO₄ Phosphoric Acid being tri-basic.

TESTS.

POTASSIUM K.

I. If to neutral and acid solution of Potassium Salts Platonic Chloride $PtCl_4$ be added a yellow crystalline (*Octahedral*) Precipitate of Potassium Platonic Chloride $PtCl_4$, 2 K Cl is thrown down, Alkaline Solutions must be acidified with Hydrochloric Acid before introduction of reagent. The Precipitate is insoluble in Alcohol and only slightly soluble in water. The Potassium Salt is concentrated by evaporation on a water bath before the Platonic Chloride is added.

II. In neutral or Alkaline Solutions Tartaric Acid $H_2 C_4 H_4 O_6$ or Hydrosodic Tartrate $H Na C_4 H_4 O_6$ produces a white granular crystalline Precipitate of Hydrogen Potassium Tartrate $H K C_4 H_4 O_6$. The solution must be concentrated or the Precipitate will not form. As mineral acids dissolve the Precipitate they must be neutralized by the addition of a little Sodium Hydroxide NaOH or Sodium Carbonate $Na_2 CO_3$. The Precipitate is readily soluble in hot water, and but slightly in cold.

III. Any volatile Potassium Salt KCl, KNO_3 , $K_2 CO_3$, $K_3 PO_4$ heated on a Platinum wire in Bunsen's gas flame imparts a blue violet tint to the flame. The obscuration of the violet of the Potassium by the presence of Sodium may be removed by introducing a blue glass between the eye and the flame. A Potassium flame viewed through an Indigo prism gives *a*, sky-blue; *b*, violet; *c*, crimson.

IV. Spectrum. Two bright lines—a red line in the red and a blue line in the violet.

SODIUM Na.

I. No Precipitate—the double Chloride of Sodium being soluble in water.

II. No Precipitate—Hydrosodic Tartrate being soluble in water.

III. Intense yellow coloration is given to the flame.

IV. Spectrum—one bright yellow double line *D*.

AMMONIUM NH_4

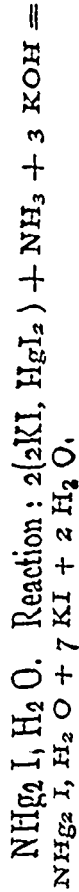
I. Yellow Crystalline (*Octahedral*) Precipitate $PtCl_4$, $2NH_4 Cl$.

II. In highly concentrated Solutions of Ammonium Salts PART of the Ammonium is thrown down as Hydrogen Ammonium Tartrate $H NH_4 C_4 H_4 O_6$ —a white Crystalline Precipitate resembling the corresponding one of Potassium, but more soluble in water and acids.

$(\text{NH}_4)_2 \text{CO}_3$ forms a white precipitate with Mercur-Ammonium Chloride when Mercuric Chloride is added to it. $2\text{NH}_3 + \text{Hg Cl}_2 = \text{NH}_2 \text{HgCl} + \text{NH}_4 \text{Cl}$.

(c.) NESSLER'S TEST.

A solution of Potassic Mercuric Iodide made strongly alkaline with KOH forms a reddish brown precipitate or yellow coloration according as Ammonia or an Ammonium Salt is present in quantity or minute traces. The precipitate consists of Dimercurammoniumiodide.



The only compounds of the alkaline metals that prevent the precipitation or coloration are Potassium Cyanide and Potassium Sulphide.

OPTICAL TESTS FOR MILK.

Two new methods for testing milk by optical appliances have been brought out. In one the aim is to find the amount of butter contained in a given quantity of milk, by diluting it with water till it displays a certain degree of transparency; in the other, the result is obtained by observing the transmission of light through a layer or film of milk of known thickness. A glass tube 23 centimeters ($9\frac{1}{8}$ inches) long, and closed at one end, contains near the bottom a small rod of porcelain (white glass) marked with black lines. A cubic centimeter of milk is measured in a pipette, and placed in the tube. The black lines on the white rod cannot be seen through the milk, but by gradually adding water to the milk, and mixing them by shaking the tube, the milk is rendered more and more transparent, till the black lines are visible. The surface of the milk in the tube then indicates, by a graduated scale on the tube, the quality of the milk, by showing the percentage of butter it contains. The apparatus, (which is called a lactoscope) appears to be simple and convenient.

The second method, while based on the same principles, employs the direct transmission of light, and reaches the same end by more complicated means. A short tube of tin, blackened on the inside, and supported upright, has an opening on one side, and opposite this, inside the tube, is a mirror placed at an angle of forty-five degrees. By placing a lighted candle at a known distance opposite the opening, its light is reflected in the mirror and thrown upward through the tube. On top of the tube is placed a round vessel of glass or metal, closed at the bottom by a sheet of clear glass. The vessel is closed at the top by a cover having an opening in the centre, in which slides up and down a small tube closed at the bottom with glass,

SPECIAL TESTS FOR SODIUM.

Potassium pyroantimonate $\text{H}_2 \text{K}_2 \text{Sb}_2 \text{O}_7$ in neutral or alkaline solutions of a sodium salt throws down a crystalline precipitate of Sodium Pyroantimonate $\text{H}_2 \text{Na}_2 \text{Sb}_2 \text{O}_7 + 6\text{H}_2\text{O}$. As free acids decompose the pyroantimonate separating Metantimonic Acid, they must be removed either by evaporation or by neutralizing them with Potassium Carbonate $\text{K}_2 \text{CO}_3$

SPECIAL TESTS FOR AMMONIUM.

(a.) Any Ammonium Salt triturated with slacked lime gives off Ammonia NH_3 . This may be tested (1) by smell; (2) turns red litmus blue; (3) glass rod dipped in an acid (HCl) and held over it gives white cloudy fumes ($\text{NH}_4 \text{Cl}$).

(c) Water containing Ammonia NH_3 or Ammonium Carbonate

and having an eye-piece at the top. The milk to be tested is placed in this vessel, on top of the tin tube, so that the light of the candle reflected from the mirror passes upward through the milk. Then, by looking through the sliding tube and moving it up and down, a point may be found where the image of the candle in the mirror can be seen through the milk. This device depends, as will be seen, on observing the light transmitted through a film of milk, and the thickness of the film is the measure of the value of the milk. The movable tube contains a graduated scale, and by comparison of this with a printed table, the percentage of butter in the milk may be ascertained. Another form of this apparatus dispenses with the mirror, by placing the candle at the bottom of a much longer tube, directly under the milk. This plan would seem to be liable to the danger of smoking the glass over the candle and rendering the readings unreliable.

While both of these appliances are admirably designed, and are said to

work well, they naturally suggest other and unpatented methods that may be used by anyone moderately skilful in the use of tools. Two sheets of window-glass bound together by any convenient means, and having a semi-circular strip of rubber between them, would make a vessel for holding a film of milk. By choosing milk of known value, placing it in such a vessel, and diluting it with water till the light of a candle, placed at a known distance, can be seen through it, would give a standard with which to compare other milk in the same manner. The amount of water added to the milk would show the proportion of butter it contained, the less water needed the thinner and poorer the milk, the more added the richer the milk. For the ordinary purposes of the dairy, it is not essential to know the exact value of the milk, but whether it is above or below a certain standard of excellence, and this such an apparatus would readily show.

PUBLIC SCHOOL DEPARTMENT.

PROMOTION EXAMINATION PAPERS.

READING.

Value 30 marks—viz: 0 to 5 for distinctness and natural tone of voice; 0 to 5 for inflection and emphasis; 0 to 5 for ease and fluency; from the remaining 15 marks deduct 1 mark for each omitted, inserted or miscalled word.

Second Book.

Page 130—From "An old game-keeper" to "going off with it."

Third Book.

Page 169—From "The jailor took the cup to "your humble servant."

Fourth Book.

Page 147—From "There was little worth noticing" to "attack anyone unprovokedly."

DICTATION.

Value 22 marks—2 marks off for each misspelled word.

Second Book.

Page 178—From "Merely waiting" to "short and thick."

Third Book.

Page 248—From "With the fleetness" to "work of an instant."

Fourth Book.

Page 167—From "His amusements and occupations" to "the symbol of barbarism."

LITERATURE.

Second Book and Spelling—Second Class.

Open books at page 153—answer orally.

1. What is a forest? (2) What is France? (3) What is meant by the sale of his fagots? (4) What is meant by supporting himself? (5) What are wolves? (6) What do you mean by hungry and fierce? (7) (Page 159) What is the ceiling of a room? (8) What is a church used for; and what is a grand church? (9) What is a platform? (10) What is a portion of his work? (11) Why did he step back? (12) Why did his friend daub the picture?

Value 6 marks each.

Third Book and Spelling—Third Class.

Open books at page 243—answer in writing.

1. To what people did the Ottawas belong? (2) What is meant by a confederacy of the tribes? (3) What is meant by expelling the British? (4) What is an ingenious stratagem? (5) Describe as well as you can a lacrosse match. (6) What are participators in the game? (7) What are deeply interested spectators? (8) What is meant by two thousands *whites*? (9) What is meant by inhumanly massacred? (10) What is the mess-room? (11) What marks are those before "The pale warrior," page 244, and after "How is this"? (12) What is a semicircle? (13) What is meant by mien? Spell and give the meaning of another word pronounced the same. (14) What is an immediate attempt? (15) Give the meaning of obvious. (16) What is the meaning of advancing and also of receding? (17) What are field

pieces? (18) Give the meaning of visible. (19) What is meant by saying the guns had been masked?

Value 4 marks each.

Fourth Book and Spelling—Fourth Class.

1. "Subsequently the war was continued; desperate resistance on one side, unrelenting cruelty on the other. Now and again it seemed that the flag of Castile would never float again upon the walls of Mexico."—4th Reader page 141.

(1.) What war is referred to here? Who took part in it? Value 3.

(2.) On which side was the unrelenting cruelty? What is unrelenting cruelty? Value 3.

(3.) What is meant by Castile? Value 3.

(4.) Tell what you know of Cortez. Value 4.

(5.) Describe Mexico. Value 3.

(6.) What is meant by "subsequently the war was continued"? Value 2.

(7.) If the flag of Castile had never again floated on the walls of Mexico, which side would have gained the victory? Value 2.

3. Distinguish between walls wauls, side and sighed, raise and rays, more and mower, fore and four, done and dun. Value 6.

4. Give a description of "The Earthquake of Caraccas." Value 20.

"Like leviathans afloat,
Lay their bulwarks on the brine;
While the sign of battle flew,
On the lofty British line;
It was ten of April morn, by the chime,
As they drifted on their path;
There was silence deep as death,
And the boldest held his breath,
For a time."

4th Reader page 226.

1. What is the reference in the first two lines?

2. What was the sign of battle? and why was it said to be on the *lofty* British line?

3. Explain the meaning of l 5.

4. What was the name of the battle? and when was it fought?

5. Who was King of England at that time?

6. Who was the English Admiral? Tell what you know of him.

7. What nations were engaged in this battle? What was the result?

Value 26.

GEOGRAPHY.

First to Second Book.

1. What is a county? A city? A township?

2. What direction does the road or street past your school-house run? How do you know?

3. Stand with your face to the north, your back to the south, your right hand to the east, and your left hand to the west.

4. Draw on your slate a map of your school-room, marking on it the teacher's desk, the door and the N., S., E. & W.

5. What county do you live in and what are the townships of it?

6. Draw an outline of the county and mark where each township is, and also the county town.

Value 72 marks.

Second to Third Book.

1. What is a map? Make a map of your school-yard, marking the different buildings on it.

2. What is a county town and where is your county town?

3. What is a province? What is your province and what is its capital?

4. Draw a map of your township, village, town or city, showing where your school-house is.

5. On the map of the world point out and describe an ocean, a continent, a country, an island, an isthmus, a cape, a peninsula, a river and a city.

6. Tell what you know about Canada and the provinces of it.

Value 72.

Third to Fourth Book.

1. Draw Ontario, marking on it all the cities and chief towns, also the lakes near it and the rivers in it.

2. Draw North America, marking all the countries with their capitals and the salt waters touching it.

3. Name the provinces of the Dominion with their capitals, beginning with the most westerly and ending with the most easterly.

4. Draw an outline of South America, placing its boundary waters.

Value 72 marks.

Fourth to Fifth Book.

1. Draw a map of the British Isles, locating all the near waters and islands, and all the chief rivers, bays and capes.

2. Draw a map of Europe, showing the countries and their capitals, all the seas and oceans connected with it, and the chief islands near it.

3. Draw a map of British India, as full as you can.

4. Name the British possessions in all parts of the world, and explain the meaning of the expression: "The sun never sets on the British Empire."

Value 72.

HISTORY.

Third to Fourth Book.

1. Who discovered America? When? Canada? When?

2. How was Canada governed up to 1792? to 1840? to 1867? since 1867?

3. Explain the meaning of U. E. L. Clergy Reserve Bill, Confederation.

4. Name the wars that have had their battle fields in Canada; when? what battle fields?

5. Explain Local Legislature, the Commons, the Senate, the Premier, the Cabinet.

6. Name the present Governor of Canada? whose place does he fill? the Premier of Canada, the Premier of Ontario and the leader of the Opposition in the Commons.

Value 72.

Fourth to Fifth Book.

1. Name the people who have claimed Canada, and give the reasons for their claims.

2. Explain Representative and Responsible government, and tell when each were introduced into Canada.

3. Name the peoples who gained a foothold in England before 1100, and how they succeeded in doing so.

4. Trace the relationship of Victoria to James I.

5. Name the sovereigns of England in order from 1066 to the present time.

6. What three powers must assent to a bill before it becomes law and tell when either of these had greater power than the others.

Value 72.

GRAMMAR.

Third to Fourth Book.

1. Decline in full *me, ox, key, who, Hamilton.* Value 15.

2. Give sentences showing the use of the same word as three different parts of speech. Value 15.

3. In what position would you use *a* for *an*, and *that* for *which* or *who*? Value 6.

4. Separate into noun part and verb part (*a*) Just then I heard a voice behind me, (*b*) Stand by the fore and main-topsail braces, (*c*) James, have you ever seen one? (*d*) Yonder is the moon. Value 16.

5. Parse: Truthfulness is one of the brightest ornaments in a man's character. Value 32.

6. Write (*a*) both genders of *woman, landlord, child, widow, nephew*, (*b*) both numbers of *staff, you Mary, chimney, which*, (*c*) comparative and superlative degrees of *bad, sad, evil, civil, lonely*. Value 15.

Fourth to Fifth Book.

1. Analyze the first eight lines in "The Death of Keeldar." Page 182, Fourth Reader. Value 18.

2. In the same sentence parse the words *rose, o'er, and, up*, (l. 2), *Percy Rede, couples, freed, career'd, sprightly, match, his, horn, wound, were, three*, Value 45.

3. Write 2nd sing., past, ind., active, pres-per., pot., inf., active and imperative passive of *dig, catch, run, slide, wrung*. Value 15.

4. Correct where necessary, giving reasons:—

(*a*) I saw a boy who couldn't do nothing.

(*b*) If you notice a man in a shaggy overcoat and moccasins, that will be I.

(*c*) Six ton of coal was ordered, and these make the third that have been delivered.

(*d*) Every one should consider their own frailties.

(*e*) Be ready to succor such persons who need thy assistance. Value 15.

5. Define *relative, nominative, infinitive*. Value 6.

COMPOSITION.

Third to Fourth Book.

1. Correct in regard to capitals and points:—

(*a*) third book of lessons

(*b*) what were the tracks like i said to him

(*c*) can you hold on five minutes longer john by gods help i will

(*d*) in the month of august 1817 the american whale ship essex sailed from nantucket for the pacific ocean Value 16.

2. Fill up the blanks with suitable words:—"Upon the banks—the —Elkhorn—the—of Kentucky, there —once—stockade fort, to —the settlers resorted as a—of refuge—the savages." Value 8.

3. Give a description of the cow, noting (*a*) where the animal is found wild and tame, (*b*) its size, shape, color, &c., (*c*) its food, disposition and usefulness. Value 24.

4. Write a short letter to a friend

giving an account of your last promotion examination. Value 24.

Fourth to Fifth Book.

1. Write the "Lord's Prayer, using the proper capitals and points.

2. Supply omissions in the following sentence:—

Once—a time, an—Yorkshire squire—to make a—to Warsaw. Untravelled and unknowing—, prepared himself—no passport,—business concerned himself—and what—foreign—to do—him?"

3. Write a description of the county in which you live, stating (a) its size, position, and importance, (b) its natural features, soil, and productions. (c) Any remarkable public works in it. (d) The county town and notable buildings.

4. Write an advertisement offering a reward for the recovery of a lost gold chain and locket.

Value 72.

ARITHMETIC.

Second to Third Book.

1. Find the sum of $42386784 + 62839 + 7865 + 49 + 876493 + 983674 + 863$.

2. Give Roman numerals for 989, 699, 898, 799 and Arabic numerals for CMXCIX, DCLXXXIX, DCCC-LXXXIX, CMXCVIII.

3. Find the product of 897869867 968 by 98760.

4. Find the quotient of one hundred and seven millions eight hundred and forty six thousand four hundred and ninety three by CMXCVIII.

5. The dividend is 1123486769 and the divisor 8936; find the quotient.

6. How many times can 8946 be subtracted from 1234548?

7. A man gained \$27.95 on a certain quantity of wood which cost him \$374 and 9 cents by retailing it at \$4.37 per cord; how many cords did he buy?

8. A farmer exchanged 9 bags of

potatoes, each containing $1\frac{1}{2}$ bush. worth 10 cents per peck, and 5 bushels cherries worth $2\frac{1}{2}$ cents a pt. for a certain quantity of tea at 67 cents per lb. how many lbs. did he receive?

Third to Fourth Book.

1. The quotient is two thousand nine hundred and ten, the dividend eight millions seven hundred and sixty-five thousand two hundred and thirty-seven, and the remainder three hundred and seventeen. Find the divisor.

2. What is the greatest common divisor of $3\frac{1}{3}$, $5\frac{7}{10}$ and $2\frac{4}{5}$?

3. What is the least common multiple of $\frac{3}{8}$, $\frac{4}{7}$, and $\frac{9}{10}$?

4. What is the result when 198 mls. 3 fur 12 pol. 2 yds. 2 ft. 9 in. is repeated 56 times?

5. From 4 piles of wood, the first containing 7 cords, 76 ft. 1671 in., the second 16 cords, 28 ft. 56 in., the third 29 cords, 127 ft. 1000 in., the other 29 cords, 10 ft. 1216 in., I have sold 45 cords and 6 cord feet, how much remains?

6. Bought 39 ac. 2 ro. 16 po. of land for \$3 75 per sq. rod, and sold the same for 25 cents per sq. foot, what did I gain by my bargain?

7. Two lots, the one containing 57 ac. 2 ro. 36 po. 12 yds., and the other 26 ac. 15 po. 6 ft., were reserved from a farm containing 280 ac. 2 ro. 28 po., and the remainder sold for \$50 per ac. How much did it bring?

8. The larger of two loads of merchandise weighed 2 tons, 2 cwt. 2 qt. 12 lbs. more than the other, which weighed 5 tons, 1 qr. 15 lbs.; a third load exceeded in weight half the sum of the weights of the others by 15 lbs. 13 oz. Find the weight of the three loads?

Fourth to Fifth Book.

1. A grocer gained $97\frac{1}{2}$ cents by selling $15\frac{5}{8}$ lbs. butter, at the rate of 8 lbs. for \$2.16; find the cost price per lb.

2. What is the weight in lbs. Avoirdupois, of £100,000 worth of gold, if 1 oz Troy be worth £4 5s?

3. How much would a merchant gain by investing \$200 in the purchase of calico, at the rate of \$4 $\frac{2}{7}$ for 25 yds., and retailing it at the rate of 30 yds. for \$6 $\frac{7}{8}$?

4. What will it cost to enclose a garden 100 yards long, 50 yards 1 ft. 7 in. wide, with a wall 4 ft. 7 in. high, at the rate of \$1.25 per sq. yard?

5. The floor of a room is composed of $\frac{3}{4}$ in. planks each 9 in. wide and 10 feet long; what will be the weight of the whole, if one cubic in. of wood weighs half an oz.?

6. Two persons own a farm together; the one owns $\frac{1}{3}$ of it, and the other the remainder, and the difference

between their shares is 16 ac. 2 ro, 22 po. 17 $\frac{3}{4}$ yds. Find the value of the farm if $\frac{2}{3}$ of it be worth \$98 per acre, and remainder \$89 per acre.

7. A rectangular piece of ground 60 feet long, 50 ft. wide is crossed in each direction by a path 10 ft. wide, and the remainder is to be sodded. How many strips of sod each 2 $\frac{1}{2}$ ft. long and 9 in. wide will be required?

8. A man gave $\frac{1}{2}$ of his estate to his wife, one-fifth of the remainder to his eldest son, and $\frac{1}{4}$ of the residue to his eldest daughter, and $\frac{1}{2}$ of what remained, which was \$1,500, was to be equally divided among his other children, who received \$150 each; required the number of his children and the value of his estate.

PARAPHRASING.

Nelson's Royal Reader, No. 5.

A Paraphrase expresses the meaning of a passage of prose or of poetry in different language. The change made is one of form or expression only, not of substance or of thought. A paraphrase resembles a free translation; a translation, that is, which does not follow the original word by word, but gives its pith or spirit in a new and independent form.

The order of the ideas in the original should be retained, as well as their relative importance; that is to say, those thoughts to which most prominence is given in the original must be most prominent also in the paraphrase; but it is not necessary to retain every detail, even in an altered form. The following are examples of the changes usually made in paraphrasing short passages:—

1. Change of expression: as,—

“The power of Fortune is confessed only

by the miserable; for the happy impute all their success to prudence and merit.”

Changed:

The *influence* of Fortune is *admitted* only by the *unfortunate*; for the *prosperous* *ascribe* all their success to *forethought* and merit.

2. Change of order; as,—

“In all speculations on men and on human affairs, it is of no small moment to distinguish things of accident from permanent causes.”

Changed:

To distinguish things of accident from permanent causes, is of no small moment in all speculations on men and on human affairs.

3. Change of construction; as,—

“What passion cannot music raise and quell.”

Changed:

There is no passion which music cannot raise and quell.

Or,

Every passion can be raised and quelled by music.

4. Change of figures into plain language; as,—

- (1.) "And now the rising morn with rosy light
Adorns the skies, and puts the stars to flight."

Changed:

And now day breaks.

Or,

And now morning begins to dawn.

- (2.) "Now came still evening on, and twilight gray,
Had in her sober livery all things clad."

Changed:

Evening stole over the landscape, and all nature was covered with the gray shades of twilight.

5. Change of words peculiar to poetry; as,—

"My sire Anchises."

Changed:

My father Anchises.

6. Putting a general word for particulars; as,—

"Helm, axe and falchion glittered bright."

Changed:

Arms and armour gleamed brightly.

6. Change of figure; as,—

"The evil that men do lives after them;
The good is often interred with their bones."

Changed:

Men's evil deeds are recorded on brass;
their good ones are often written in water."

8. Omission of unnecessary remarks and ornaments of style; as,—

"Wide o'er the sky the splendor glows,
As that portentous meteor rose;
Helm, axe, and falchion glittered bright,
And in the red and dusky light
His comrade's face each warrior saw,
Nor marvelled it was pale with awe.
Then high in air the beams were lost,
And darkness sank upon the coast."

Paraphrased:

As the meteor rose higher and higher, and its brightness increased, the faces of the warriors turned pale from fear. At last, when high up in the heavens, it disappeared, and all was dark.

It is necessary that the pupil should make himself completely master of the passage to be paraphrased. Any vague or erroneous conception formed in his mind will inevitably be reproduced in the paraphrase. One of the chief ends of paraphrase is to ascertain whether the pupil has understood the passage. If he has fairly grasped the author's meaning, he will have comparatively little difficulty in expressing it in words of his own.

*** The best way to write a paraphrase of a passage, either of prose or of poetry, is first to frame a series of questions on its subject-matter. These questions will bring out clearly the salient points in the passage; and the answers to them—put in the form of complete sentences, and linked together by whatever connecting phrases may be required—will form a complete and lucid paraphrase, having the freedom and freshness of an original composition.

The questions appended to the following passages for paraphrasing are intended to be used in this way. In the case of the first of them, the answers to the questions forming the paraphrase are also given. For condensed paraphrase of prose narrative, any of the lessons in the reading may be selected.

PASSAGES FOR PARAPHRASING.

THE LAST DAYS OF GEORGE III.

"He was not only sightless, he also became utterly deaf. All light, all reason, all sound of human voices, all the pleasures of this world, were taken from him. Some slight lucid moments he had, in one of which the queen, desiring to see him, entered the room, and found him singing a hymn and accompanying himself at the harpsichord. When he had finished, he knelt down and prayed aloud for her, then for his family, and then for the nation; con-

cluding with a prayer for himself, that it might please God to avert his heavy calamity from him, but, if not, to give him

resignation to submit. He then burst into tears, and his reason again fled.
Thackeray.

QUESTIONS.

1. By what physical infirmities was the insanity of George III. accompanied?

2. From what sources of pleasure was he cut off?

3. Did his intelligence ever return?

4. Who, on one of these occasions, went into his room?

5. What was he doing as she entered?

6. That over, what did he do?

7. For whom did he pray?

8. What did he ask for himself?

9. What followed?

1. During his insanity, George III. became both blind and deaf.

2. From all the sweetest enjoyments of life he was hopelessly cut off;—from the pleasant sunshine without, as from the light of reason within; from the sounds of nature, as from the cheering voices of his friends.

3. Sometimes, for a brief interval, his intelligence returned.

4. On one of these occasions his queen went into his room to see him.

5. As she entered he was playing on the harpsichord and singing a hymn.

6. 7. That done, he knelt down and prayed for his queen, for his family, for his people, and lastly for himself.

8. He asked that, if it pleased God, his great affliction might be removed; but, if that could not be, that he might have submission and patience.

9. Then came a flood of tears, and his brief lucid interval was over.

A TRUE MAN.

“THE man whom I call worthy of the name, is one whose thoughts and exertions are for others rather than for himself; whose high purpose is adopted on just principles, and is never abandoned while heaven or earth affords means of accomplishing it. He is one who will neither seek an indirect advantage by a specious road, nor take an evil path to secure a really good purpose.”
SCOTT.

QUESTIONS.—Who alone is worthy to be called a man? On what is such a one's lofty aim based? How long is it pursued? What means of securing indirect benefits will he avoid? What, in his estimation, will a good end not justify?

THE FISHERMAN.

“A perilous life, and sad as life may be,
Hath the lone fisher, on the lonely sea;
O'er the wild waters labouring far from home,
For some bleak pittance e'er compelled to roam:
Few hearts to cheer him through his dangerous life,
And none to aid him in the stormy strife:
Companion of the sea and silent air,
The lonely fisher thus must ever fare:
Without the comfort, hope,—with scarce a friend,
He looks through life, and only sees its end!”
Barry Cornwall.

QUESTIONS.—What kind of life does the fisher lead? Where does he labour? For what is he forced to go so far from home? What are there few hearts to do to him? Where are there none to give him help? What are his sole

companions? Of what comfort is the solitary fisher destitute? What is the only thing in life of which he is certain?

THE STREAM OF LIFE.

"LIFE bears us on like the stream of a mighty river. Our boat at first glides down the narrow channel, through the playful murmuring of the little brook, and the winding of its grassy border. The trees shed their blossoms over our young heads; the flowers on the brink seem to offer themselves to our young hands; we are happy in hope, and we grasp eagerly at the beauties around us; but the stream hurries on, and still our hands are empty.

"Our course in youth and manhood is along a wider and deeper flood, amid objects more striking and magnificent. We are animated by the moving picture of enjoyment and industry passing before us; we are excited by some short-lived disappointment.

"The stream bears us on, and our joys and griefs are alike left behind us. We may be shipwrecked, but we cannot be delayed. Whether rough or smooth, the river hastens toward its home, till the roar of the ocean is in our ears, and the tossing of its waves is beneath our feet, and the floods are lifted up around us, and we take our leave of the earth and its inhabitants. Of our further voyage there is no witness save the Infinite and the Eternal.

Bishop Heber.

QUESTIONS.—To what may the progress of life be compared? What is its aspect in youth? By what beauties are we surrounded? What do we strive eagerly to do? With what success? What is the character of the flood in youth and manhood? By what are we stimulated? by what ruffled?—What do we leave behind us, as the stream bears us on? What can we not be, even though shipwrecked? As the river nears its home, what is in our ears?

what is beneath our feet? Of what do we lose sight? What surround us? Of what do we take leave? Who is sole witness of our further progress?

FIGURES OF SPEECH.

When we call a cunning man, a *fox*; a beautiful girl, a *lily*; a fertile land, a *garden*; or the moon, the *lamp of night*—we use the words *fox*, *lily*, &c., not in their ordinary or literal sense, but with a fanciful application. The special forms of language used in this way are called the FIGURES OF SPEECH. The use of these figures makes a writer's style, or manner of writing, graceful and lively.

The common figures are 1. SIMILE; 2. METAPHOR; 3. PERSONIFICATION; 4. APOSTROPHE; 5. INTERROGATION; 6. EXCLAMATION; 7. CLIMAX.

1. SIMILE expressly compares two objects, for the purpose of assigning to the one some property or properties belonging to the other, as—

"Charity, *like the sun*, brightens every object on which it shines."

Here the two objects compared are *charity* and *the sun*. The object of the figure is to illustrate the effects of charity by comparing them to the well-known brightening influences of sunlight.

A simile is always introduced by the word *like* or *as*.

2. METAPHOR also compares two objects; but it treats the one as if it really were the other; as,—

"Charity warms and brightens every object on which it shines."

Here charity is not said to be *like* the sun, but is spoken of as if it actually were the sun.

3. PERSONIFICATION speaks of the lower animals and things without minds as if they were human beings; as,—

"All the trees of the field shall *clap their hands*."

A work like "The Pilgrim's Progress," in which personification and metaphor are used throughout, is called an *Allegory*. *Parables* and *Fables* belong to the same class.

4. **APOSTROPHE** turns aside from the main line of thought to address the absent or the lifeless ; as,--

"Then shall be brought to pass the saying that is written, Death is swallowed up in victory. *O Death! where is thy sting?*"

5. **INTERROGATION** asks a question for the purpose of making an assertion in a striking and lively way ; as,--

"Have not the ministers promised to support the measure?" That is to say the ministers *have* promised to do so.

6. **EXCLAMATION** asserts in the form of an interjection ; as,--

"How beautiful is night!" That is to say, Night is very beautiful.

7. **CLIMAX** makes a series of statements, increasing in force and dignity as they advance ; as,--

"What a piece of work is man! How noble in reason! how infinite in faculties! in form and moving, how express and admirable! in action, how like an angel! in apprehension, how like a god!"

THE SCHOOL MAGAZINE.

Mr. Charles Leyden of Messrs R. Duncan & Co., publishers, Hamilton, assumed control of the business management of the **SCHOOL MAGAZINE** on the 15th ult. At no period in the history of the **MAGAZINE** has its circulation increased so rapidly as during the past few months; about one-half of the public school teachers of the province are subscribers, and we have the gratifying assurances of leading educationists that it meets the wants of practical teachers, and is of great assistance to them in the daily work of the class-room. The publication of articles showing the actual work done in the schools of many inspectorates affords a ready means of comparing the work of teachers in different parts of the province.

The special feature of the **SCHOOL MAGAZINE** is the practical work done in the following departments:—

HEALTH DEPARTMENT.—The publication of a health department is a new feature in school journalism; the last five issues have contained a series of papers on "The Scholar's Eye," that have attracted a good deal of favorable comment from practical teachers and others. Many difficulties that school children encounter in their

studies are traceable to defective vision or light, which the editor, Dr. Hamilton, has fully verified during the course of his professional practice. The object we had in view in opening a department of this kind was not merely to call attention to the hygienic defects of school accommodation, and to systems of school routine dangerous to student life, but also to suggest improvements and remedies, and we have reason to know that our aim has, in some degree, been realized: the articles on "The Eye" have already done a great deal of good.

ENGLISH DEPARTMENT.—What this department of the **MAGAZINE** has been in the past is an indication of what it will be in the future. The course we have pursued seems to have approved itself to our subscribers. The subjects which naturally come under this department are numerous and extensive, and any one of them would furnish topics of discussion which would alone occupy the whole space set apart for this department. We cannot therefore undertake to have each sub-department of English represented in each month's issue. We propose to make the answering of examination papers a distinctive feature. In English Grammar, examination

papers for 1st and 2nd class teachers of all grades will be answered, and also the examination papers for junior and senior matriculation. In Literature and Philosophy the work will comprise the answering of all papers set in these subjects at the examinations mentioned above; also notes and criticisms upon the various authors read in Public and High Schools.

Questions from correspondents having any bearing upon the work just indicated will receive prompt attention.

MATHEMATICAL DEPARTMENT will contain such university and professional examination papers as may be of most general interest to our readers. In addition to this the series of 1st year Algebra papers commenced in this number will be continued and be accompanied by solutions and explanations whenever these shall be considered necessary. These papers cover rather more ground than is required for intermediate work, but so far as they coincide with that limit are of the same degree of difficulty as the work required for 2nd class teachers.

SCIENCE DEPARTMENT.—In the Science department an earnest effort will be made to give a clear and comprehensive digest of chemical knowledge required by 1st and 2nd class candidates for teachers' examinations. A series of articles on the chemistry of

the metals will begin with this issue. It will embrace their classification into groups, their symbols, occurrence, preparation, properties, compounds, uses and characteristic tests, accompanied by a simple yet thoroughly scientific course of qualitative analysis that will enable teachers and pupils to pursue the study of the metals in a practical as well as theoretical manner.

PUBLIC SCHOOL DEPARTMENT.—This department will contain sets of examination questions on the subjects embraced in the Public School course of study, together with answers to the more difficult questions, annotations on the authors read, notes on object lessons, short papers on methods of instruction, and on time-tables. The April number will contain a graded course of instruction for rural Public Schools. We invite the special attention of Public School teachers to this department, and ask them to send us for publication specimens of the work done in their own schools.

Each of these departments is conducted by a specialist who has a practical knowledge of the requirements of our schools. Teachers and students are invited to send us criticisms on the work presented; and contributions on literary, scientific or professional topics, if written in good form, will be accepted for publication.

BOOK NOTICES.

AN ELEMENTARY TREATISE ON PLANE TRIGONOMETRY, by J. MORRISON, M. D., M. A., Principal of the Walkerton High School. CANADA PUBLISHING Co., Toronto.

This book has been given to the public in answer to a demand for a work on Trigonometry adapted not only for the classes in High Schools, but also for those in Universities. The

more elementary portions are printed in a large type, and form a connected treatise independently of the portions printed in the smaller type, which are intended for candidates reading for honors.

In discussing the trigonometrical functions, the author has very wisely adopted both the method of ratios and that of the "line definitions."

With the view of making the study of Trigonometry more interesting the solution of right angled triangles, and its application to the determination of heights and distances, are introduced early in the book. A marked feature of the book is the practical bearing and utility of Trigonometry in Surveying, Navigation and Astronomy. The examples are not too numerous and are skilfully selected; they are taken chiefly from the examination questions set at the Examinations of the Universities of Cambridge, London, Toronto, McGill and Harvard.

It is not to be expected that there would be any marked originality of treatment in a new work on Trigonometry; and although the author expresses his indebtedness to the works of Todhunter, Chauvenet and others for suggestions made use of in preparing the book, we think that for originality of arrangement and discussion, for the practical character of the book throughout, and for the conciseness, clearness and fullness of its proofs, it compares very favourably with the best authors of England and the United States. The typographical portion of the work is all that can be desired.

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 EPOCH PRIMER OF ENGLISH HISTORY.—[AN INTRODUCTORY VOLUME TO THE EPOCHS OF ENGLISH HISTORY, by REV. MANDEL CREIGHTON, M. A. W. J. GAGE & Co., Toronto.]

This is the title of a book purporting to be an introduction to the Epochs of English History. The Epochs themselves were intended to serve as an introduction to the study of history, but proving unsatisfactory in many respects, this misfortune led to the still greater infliction of this little book, an infliction it certainly is. Small as it is, it is a huge error, and capable of working most perniciously in the schools in which it is used. The writer evidently labored under the

delusion that childish jargon was all that was required to render abstruse matters intelligible to children. Having possessed himself of this idea he proceeds to work it out with the most wonderful results. The heroism, the mighty deeds, the chivalry and the glory of old England's story, are hidden under a confused heap of twaddle about the King's power and the barons; parliamentary rights and taxes; ministries and measures crowded together in a most uninviting monotony. To touch the imagination of the child would be a crime. All the old heroes, it is true, are left, but they appear in modern garb, and their deeds of prowess, their bravery, their queer old customs, and their quaint speeches are absent, and replaced by uninteresting and unintelligible details of statesmanship and political intrigues, and all this to mere children, and told in the language of the nursery, often indeed as difficult to understand and as free from the restraints of grammar as that juvenile dialect. Surely if children are old enough to read of wars and parliaments and treaties they are old enough to be spoken to in plain English sentences, and to be instructed without the imitation of their own vicious but excusable imperfections in expression. It is indeed a poor imitation of children's style. To begin sentences and even clauses with, "so," and "so," or "also," and to substitute an awkward and unfamiliar combination of English words for a well known term of Latin origin, as, for instances, "to come together," for "to unite," "to hold together," for "to remain united," exhaust Mr. Creighton's idea of "coming to the level of the child," no, we beg his pardon, there is one more triumph he achieved, there is a delightful freedom from all conventional rules of grammar. Here we have the true juvenile freedom, an untrammelled freshness that disdains the restriction of art; the style may be foolish; the narration may

be inconsecutive; the phraseology may be affected, but the grammar is juvenile; it is glorious in its unrestrained liberty; the descent to the child's level is here completely successful. Let us take a few gems from this authorized book, on the very first page we have the awkward expression, "in this way the Romans *got to know of* Britain:" on page 5: "and from these *comes* the Anglo Saxon Chronicles. which tell us about these old times."

Here is a longer specimen of the grammar and style of this strange book: "At last William ordered his men to pretend to flee; when the English saw *them flee*, they forgot the orders of Harold and pursued *them*. Then the Normans turned and drove *them* back, and pressed up to the hill-top where *was* Harold and his bravest soldiers. *Longtime* they fought, till he was wounded in the *eye*, and *fell*; then the English fled."

On page 25 we find "The barons did not care *who* they fought for."

The juvenile "and so" vanishes as the book advances and is entirely forgotten long before the end, but with an admirable consistency the juvenile grammar is carefully cultivated to the last. On page 121 we have this sentence:—"The House of Commons, *welch* represented the middle classes, *were* afraid of changes." On page 122 we find—"At the head of this party was Fox and Lord Grey," and finally, it is the last thing parted with, the very last sentence being of questionable grammar:—"The future of England depends upon each generation showing the same courage, wisdom and moderation *as was* shown by those who made England *what she is*." Such are a few of the more glaring slips in Grammar with which the book abounds. The faults we have above pointed out form a very grave objection to a school text-book, but this book is open to another objection, viz: it is really too advanced for young children

to understand; the attempt to suit it to the child's mind by mere phraseology resulting merely in greater abstruseness. Indeed, we cannot see any useful end to be subserved by this "Epoch Primer," nor can we understand why it was authorized by the Minister of Education. It is not only useless, but positively injurious.

BEATTY'S SYSTEM OF PRACTICAL PENMANSHIP.—ADAM MILLER & CO., TORONTO.

This series of copy books is profess- edly based upon that of Payson, Dunton & Scribner, but is in every respect vastly inferior to it. The late Mr. Hugh McKay, probably the best penman ever Canada produced, made systems of penmanship a special study, and he thus characterizes this series of copy books:—"This system (Beatty's) is probably the worst series of copy books in use in Canada to-day (1878); it is made up of copies from several systems, and its eclectic character makes it impossible to reconcile the style of writing presented with the principles given."

In copy book No. 1 the writing is all done by tracing upon light red letters; the attempt to cover the red letters with the tracing makes the child's efforts at writing anything but encouraging. All the letters are supposed to be taught in this book, but they are introduced without any apparent method; for example, *w* precedes *u* of which it is a modification; *c*, which is made strongly like an *e*, comes before *o*; the word "*sir*" is given, but two copies, afterwards (the books are not even paged) *s* is taught, and in the page following that, the pupil is shown how to make *r*!!

In good copy books exercises are given upon the letters after they have been taught, but in these *u*, *x*, *n*, *m*, *e*, *c*, *o*, and *a* are taught in consecutive copies without any intervening exercises.

In No. 2, exercises are supposed to be given upon all the letters taught in No. 1, but *v*, *w*, and *x* are omitted, and the letter *j* is written throughout without the dot.

In No. 4, the most important book of the series, as the majority of pupils leave school at this stage, *b*, *h*, *j*, *q*, *v*, *w*, *x* and *z* do not occur.

In No. 5, *f*, *v*, *x* and *z* are left out.

In No. 6, *q* and *z* are not found.

In No. 7, *g*, *x* and *z*, and in No. 8, *q* and *z* and their capitals are omitted.

No. 9 is still more defective, it does not contain *k*, *j* and *q*, and the capitals *R*, *U*, *X* and *Z*.

q, *x* and *z* and the capitals *O*, *P*, *Q*, *R*, *U*, *X* and *Z* are not found in Nos. 10 and 11; why should *J* and *I* be made so near alike?

No. 8 contains no fewer than four different styles of writing. In No. 9 we have one style of writing on the first page and a totally different style in the following page. This is certainly a cheap way of compiling copy books, and one that would not commend itself to every publishing firm. They are made simply to sell—not to benefit the pupils using them. The shading of capital letters cannot be made if the

directions for holding the pen are observed; the heaviest part of the shading is on the horizontal stroke.

The commercial forms given in the more advanced books do not come in any order, nor are they all written in the same style of penmanship. The paper too is unfit for copy books; and the engraving is poorly done compared with that of other Canadian copy books available for schools.

The publication of the *School Examiner* by Gage & Co., of Toronto, is an open acknowledgment that their other monthly, the *Canada School Journal*, has failed to secure a hold upon the teachers of the province, and no better indication of the success of the SCHOOL MAGAZINE can be found than in the attacks made upon it in the regular monthly issues of the *Journal*. Our fault is that we exist; and our existence, it seems, is a check to Mr. Gage's advertising projects; the teachers of the province refuse to buy the pages of advertisements which he would fain dignify by the name of *Journal*! Hence these tears and lamentations.

NEWS ITEMS.

ECONOMICAL ASSOCIATION.—Some of the leading men of this section, who profess to be alarmed at the rapid increase in teachers' salaries, are clamoring for a Trustees' Association, having in view the payment of teachers' salaries according to a fixed and uniform standard of gradation.—*Galt Reformer*.

MODEL SCHOOL SUPPORT.—Port Hope considers that it is not repaid by

an annual grant of \$200 for the work done by the Head Master of its Public School as Principal of its Model School. The Model School pupils come largely from outside the corporation. It was hence argued that the grant from the Counties (Northumberland and Durham) should be increased. A deputation, representing these views, recently made an unsuccessful application to the Counties' Council at Cobourg.

FACETIÆ

ORTHOGRAPHICAL.

With tragic air the lovelorn heir
Once chased the chaste Louise;
She quickly guessed her guest was there
To please her with his pleas.

Now at her side, he kneeling sighed
His sighs of woeful size;
"Oh, hear me here, for lo, most low
I rise before your eyes.

"This soul is sole thine own, Louise—
"Twill never wean, I wean.
The love that I for aye shall feel,
Tho' mean shall be its mien!"

"You know I cannot tell you no,"
The maid made answer true—
"I love you aught, as sure I ought—
To you 'tis due I do."

"Since you are won, O fairest one,
The marriage rite is right—
The chapel aisle I'll lead you up
This night," exclaimed the knight.

Sentimental young grammarians are very apt to parse "love" as a "fine night verb."

Heartless scientist—"Miss Adelina, permit me to ask your acceptance of my hand—" Gushing maiden—"O, professor—so sudden—" Heartless scientist (proceeding)—"My—er—handbook of the Buddhist psychology and ethnology of the Hindoos." (Collapse of G. M.)—*Puck*.

Professor—"Mr. B., will you—" Sleepy student (waking to the realities of life)—"Not prepared, sir." Professor (pursuing the even tenor of his sentence)—"be kind enough to open that window by you?"—*Harvard Crimson*.

An old-fashioned lady wants to know why the graduates of "female" colleges

always have their ages printed after their names in reports of alumni meetings—Miss I. Smith, President ('70); Miss Jones, Vice-President ('60); Mrs. Robinson, Secretary ('78), etc., etc.

We can dimly perceive coming up the steep of time, the day when the professor of pugilism in our college faculties will sit at the right hand of the Presidents, and look down upon professors of theology and metaphysics.

Professor—Can you give me a common synonym for "copse"? Soph.—Well "peelers," I believe, sir.—*Acta Columbiana*.

Few soldiers are so severely taxed on the drill ground as many children are in our show schools, and others which aspire to high reputations for order, but, as if all this cruel training were not destructive enough to health and spirits, the custom grows more and more popular with teachers to make school hours more the time of recitation, the lessons to be studied at home.

The other day a teacher of German asked an unregenerate student what the gender of a certain noun was. The student quickly replied; "I think it is neuter, sir. At any rate it is neu-ter me."

The Indians used to "bury" their dead in the tops of high trees. This was considered an awful joke on the medical students, burrowing around in the ground beneath.—*Burlington Hazekeye*.

Erskine puzzled the wits of his acquaintance by inscribing on a tea-chest the words, "Tu doces." It was some time before they found out the wit of this literal translation—"Thou tea-chest."