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Consolidating "THE EDUCATIONAL WEEKLY" and "THE CANADA SCHOOL JOURNAL"

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TORONTO, JUNE 16, 1895.

Vol. IX.  
No. 5.

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We are about to communicate directly by Circular with all the School Boards in the Province, in order to gain full information with regard to vacancies to be filled before the reopening of the schools. We expect within a very few weeks to be in possession of particulars with regard to a large number of vacancies.

We hope, therefore, shortly to be in a position to invite communication from teachers of all grades who, for any good reason, may wish to learn about such vacancies with a view to making application.

Fuller information will be given in next number.

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# The Educational Journal

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"The Educational Weekly" and "The Canada School Journal."

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in Advance.

TORONTO, JUNE 15, 1895.

Vol. IX.  
No. 5.

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## Editorial Notes

OUR thanks are due to Mr. Johnson for so kindly supplementing his article in a previous number with the practical illustration which will be found under the head of "Hints and Helps." We hope that the two papers may prove very helpful to many teachers and students.

WE beg leave to call the attention of all teachers and all school boards interested to the advertisement of THE EDUCATIONAL JOURNAL Teachers' Bureau, which will be found in our advertising columns. It shall be our sincere aim and effort to make THE JOURNAL practically still more useful to teachers, through the medium of this bureau.

FOR the advantage of some of our subscribers, who will, no doubt, be glad to see the solutions of certain problems before the close of the term, we give in this number the Mathematics, which would in regular course not have appeared until July 1st. We have, also, repeated, with the appropriate diagrams, two problems which were published in last number, but from which the diagrams were accidentally omitted.

WE have received a few interesting postal-card contributions for our proposed symposium on the question of the utility or otherwise of requiring "home-work" from children under ten or eleven years of age. These will appear in next

number. We should be glad to receive more of the same kind, embodying, as some of these do, with admirable brevity, the opinions, with reasons drawn from observation or experience, of teachers who keep their minds as well as their eyes open, and do their own thinking.

At the Lanark County Teachers' Convention (and we dare say at many others) the question, Who should examine the Entrance papers? was discussed. Miss McDonald, of Perth, read a well-prepared paper on the subject, taking strong ground in favor of the view that Public School teachers are best qualified for the work, and should be chosen as examiners. There is certainly much to be said in support of this view, and we are glad to see that some of the High School teachers who were present supported Miss McDonald's position, and promised to do what they could to promote the change, should the Public School teachers petition the Minister of Education in favor of it. We should be glad if Miss McDonald would send us her paper, or a synopsis of it, for publication.

At the East Kent Teachers' Association the two interesting questions, How to deal with the troublesome boy? and, How to deal with the troublesome girl? were the subjects of animated discussion. The questions are of intense practical interest to almost every teacher. In fact, we do not know whether we might not safely omit the qualifying "almost." If there are any teachers who have never had occasion to solve for themselves one or the other, or both, of these problems, they may congratulate themselves on being happy exceptions. We very much wish we had notes of this discussion, that we might give a digest of the thought and experience of the teachers of Kent for the benefit of our readers generally. Could not some of those who took part in the discussion, or some of those who listened to it, give us a brief account of the best things said, or the best methods proposed?

WITH reference to the proposal, which has been advocated by some, to specialize

to a greater extent in the High School programmes, so as to enable students preparing to teach to devote their time more exclusively to subjects absolutely necessary for the examinations, and to excuse them from certain studies of the course which have no immediate practical bearing upon their professional aims, one teacher writes us strongly deprecating any such specialization of the courses for teachers. He is of opinion that any such change of system would be emphatically a change in the wrong direction. "The teacher needs," he says, "as broad an education as possible." He thinks also that the substitution of the twenty-one for the eighteen year age-limit would do much to minimize or cure the evil of using teaching as a stepping-stone to some other profession. The "short cut" to any profession is a mistake, even from a pecuniary point of view, as there is always most room as well as best remuneration in the upper stories.

"RECENTLY one of the pupils of a Brooklyn Grammar School put his books under his desk and mastered his next day's lessons before going home. The teacher discovered this fact, and, although he had his lesson, he was marked with a failure because he had not learned his lesson after hours and away from school. It was his duty, she said, to sit upright and fold his arms after his own recitations were over."

The above, from the *Brooklyn Eagle*, seems to have some bearing upon the question of home-work. Perhaps it is better to leave each teacher to discover what that bearing is, and to draw his or her own moral. The clandestine feature of the case is certainly not to be commended. An incident which fell under our own notice suggests the query whether the giving of home-work is not often, in a manner, forced upon the teacher by the desire of ignorant parents to see their children busy while at home. A parent who realized that his children were suffering injury in various respects from having too much home-work, went to the teacher to ask if the amount could not be reduced. The moment the subject was mentioned, and before opportunity for explanation had been given, the teacher began to apologize for having given so little home-work for the last few days. She felt relieved when the true objection was made clear. She was evidently accustomed to be found fault with by parents for not assigning enough of it. The two facts are certainly suggestive.

## English.

All articles and communications intended for this department should be addressed to the ENGLISH EDITOR, EDUCATIONAL JOURNAL, ROOM 5, 11½ Richmond Street West, Toronto.

### SPRING LESSONS.

MISS M. A. WATT.

The joyous spring is come again; the moth flutters its feeble wings, and leaves its deserted winter home, the catkins hang their grey, yellow, and red fringes forth to the breeze, and happy children bring in the treasures of the woodland to adorn their teacher's desk. Every schoolroom window-sill, we hope, is like our own, full of boxes and pots of plants and seeds, and every school blackboard is blooming with trillium, hepatica, marsh-marigold, and trailing arbutus. On our wall hangs a large-leaved calendar, on which are the records of observations of weather, birds, insects, and plants, made by the children since the first of March; the observations, which, by the way, are very numerous on Saturdays and Sundays, are written around the dates on which the observation was made, as, "First robin seen by J.H.," written on March 10th. We have kept our eyes upon the budding trees, and have noticed that the "chestnut buds are sticky," and further on have seen the bud-wrappings unclose and the taper fingers of the leaf peep out of its winter glove, so softly lined. To-day we have the branches "that just begin to feather with their leaves," this time next week the chestnut will have all its tassels hanging greenly in at our windows. What grander lesson can we teach our pupils than the charming story of spring's renewals, so like the mystery of life after death? What care has been taken, ever since the last withered leaf fell from the tree, that there should be the myriad leaves of to-day ready to greet the May-day! No fairy tale can interest and charm like this story of the awakening of the flowers. And what a power we give our pupils, when we lead them into enjoying the everyday beauties of the world! What Jean Ingelow says in her poem, "Dominion," they may realize:

"When found the rose delight in her fair hue?  
Color is nothing to this world; 'tis I  
That see it.

..... I will step  
On the ledges of this world, for it is mine;  
Consider it,

(This outer world we tread on,) as a harp—  
A gracious instrument on whose fair strings  
We learn those airs we shall be set to play  
When mortals hours are ended. Set the wings,  
Man, of thy spirit, move on it as wind  
And draw forth melody."

"I take the land to my breast,  
In her coat with daisies fine;  
For me are the hills in their best,  
And all that's made is mine."

"I grant to the wise his meed,  
But his yoke I will not brook,  
For God taught me to read—  
He lent me the world for a book."

To this end, the wise teacher will use the material so lavishly brought to her these spring days, and teach the children lessons whose value they can have no estimate of. Besides the botany, simple as given in the Reader, "The Flower" being the lesson taken, a search may be instituted for references to springtime and its beauties. The Readers having been searched, other books of poetry may be examined. Tennyson, Longfellow, Moore, Burns, and any others convenient to get may be searched, the children writing out or memorizing the extracts they find. It is wonderful how interest is shown in such a search, by the parents as well as the children.

Wordsworth gives us some rare flower notes, truthful to nature, as, for example, this little gem:

"I wandered lonely as a cloud  
That floats on high o'er vales and hills,  
When all at once I saw a crowd,  
A host, of golden daffodils;  
Beside the lake, beneath the trees,  
Fluttering and dancing in the breeze.

"Continuous as the stars that shine  
And twinkle on the milky way,  
They stretched in never-ending line  
Along the margin of a bay;  
Ten thousand saw I at a glance,  
Tossing their heads in stately dance.

"The waves beside them danced; but they  
Outdid the sparkling waves in glee;  
A poet could not but be gay  
In such a jocund company;  
I gazed—and gazed—but little thought  
What wealth the show to me had brought.

"For oft, when on my couch I lie,  
In vacant or in pensive mood,  
They flash upon that inward eye  
Which is the bliss of solitude;  
And then my heart with pleasure fills,  
And dances with the daffodils."

Longfellow is especially attentive to the growing flowers, noting them with true poet's eyes and tongue. His "Birds of Killingworth" makes a fine reading for an Arbor Day celebration, also "Flowers," "An April Day," and "It is not Always May," while "Hiawatha" and "Evangeline" are full of rich nature-touches. Nothing can surpass "The May Queen" for the beauty of its references to flowers. There are many gems of Tennyson's that are quite within the range of young children. There is a child-song, "The City Child," which would be sure to please:

"Dainty little maiden, whither would you wander?  
Whither from this pretty home, the home where  
mother dwells?"

'Far and away,' said the dainty little maiden,  
'All among the gardens, auriculas, anemones,  
Roses, and lilies, and Canterbury bells.'

'Dainty little maiden, whither would you wander?  
Whither from this pretty house, this city house  
of ours?'

'Far and away,' said the dainty little maiden,  
'All among the the meadows, the clover and the  
clematis,

Daisies and kingcups, and honeysuckle flow-  
ers."

"The Grasshopper," "Nothing Will Die," "Mariana," "The Flower," are all poems suited to children's capacity, and any of them would help a child to a broader and more intelligent view of nature; though "Mariana" might have a morbid effect upon a sensitive mind, its fidelity of description entitles it to notice in this connection.

So our spring lessons may grow, perhaps beyond our time-limit, for time is truly short so near the midsummer examinations. But we are building, the children are growing as the flowers themselves are growing, and

"We must not tear the close-shut leaves apart;  
Time will reveal the calyxes of gold."

We need the patience of the seed-sower and the gardener, who wait for the slow growth of the plant until it reaches, by degrees, its full perfection.

### CORRESPONDENCE.

G.L.—Burns' Highland Mary was Mary Campbell, who was probably in service at the house of Gavin Hamilton, in Mauchline, when the poet wrote the songs, "Will ye go to the Indies, My Mary?" and "My Highland Lassie, O," in 1786. In October of that year Mary died. Three years later the touching lines were composed, "To Mary in Heaven." There is difficulty in associating Highland Mary with the Mary of "Afton Water." The poem was written, it is believed, in 1791, five years after Mary's death, and seems to arise from "a reverie of retrospective admiration of her sleeping image enshrined 'within his bosom's core.' Did he, in that still valley, amuse his fond fancy by reflecting what might have been his fate had not death seized her as his prey? And did he there, in imagination only,

'Wander as moon rises high,  
My flocks and my Mary's sweet cot in my eye?'"  
"It is there," "there" is an adverb of place, modifying the action of existence expressed by the verb "is."

J.W.A.—"Historic" differs from "historical" in suggesting, possessing the distinction given by the events of history; while "historical" suggests connection with history, without reference to any prestige. Quebec is an historic city, because rich with the charm of momentous actions. Chatham's speech on the American Revolution is historic, because of its great import. A book may be historic, epoch-making, but historical books are usually merely books concerning history; deeds are historical when capable of authentication by history, etc. Similarly, "poetic" denotes the possession of the quality that makes poetry—a poetic child, the poetic muse; while "poetical" usually means pertaining, connected with,—poetical selections such as show the characteristics of the work of the poetic mind. "Classic" denotes the presence of general characteristics that bring a work of art, etc., up to the highest standard of artistic judgment; "classical" rather pertaining to the classics; a classic passage, but a classical atlas. These distinctions are not always strictly kept with these words, and in many words the double forms do not differ in meaning, but have only a preferred form. In other words only one form is possible.

SUBSCRIBER.—The volumes known as "Open, Sesame" (I. and II.), contain excellent selections in prose and verse suitable for children's reading and recitation. They are published in Boston by Houghton, Mifflin & Co., we think.

M.R.—The analysis of the first two stanzas of "As ships, becalmed," will be made clearer by putting them in prose order. As ships, becalm'd at eve, that lay with canvas drooping, side by side, two towers of sail at dawn of day, are scarce descried long leagues apart; when the night fell, the breeze up-sprung, and they plied all the darkling hours, nor dreamt (they) but (that) each was cleaving the self-same seas by each, side by side; e'en so [those are who, etc.]. The first clause calls up the comparison to ships in a dependent adverbial clause of manner—"As ships . . . descried." The subject of the clause is "ships"; it is modified by (1) "becalm'd at eve," (2) by the adj. clause "that lay . . . side," (3) "two towers of sail at dawn of day"; predicate, "are descried"; modified by (1) scarce, (2) long leagues apart. Then follows an explanatory parenthesis in independent clauses: the three co-ordinate principal clauses, (1) "the breeze up-sprung," (2) "they plied all the darkling hours," (3) "dreamt but each was cleaving . . . side," are modified by the dependent adverbial clause, "when fell the night"; making up, therefore, a compound-complex sentence, of which "dreamt (they)" is the principal, and "each was cleaving . . . side" the subordinate part. Then follows the suggested principal statement "e'en so," which the poet does not finish.

ARES.—

"How many things by season season'd are  
To their right use and true perfection!"

The sentence is principal exclamatory sentence. "Things" is the subject, modified by "how many"; verb, "are season'd," modified by "by season" (cause), and by "to their right use and true perfection" (purpose). It is supposed that the Public School Grammar, properly taught, will cover all ground necessary for the Public School Leaving Examination. So with the Public School History.

T.H.B.—The term "grammatical function," as applied to words, denotes the force, value, and use of the words in a particular sentence. E.g., in the sentence, "He went *with great haste*," the grammatical function of "with great haste" is that of an adverb (cf. "very hastily"). By "grammatical relation" is meant the relation of the word(s) to that part of its sentence to which it is most closely connected. In the case of the sentence quoted, grammatical relation of "he" is subjective nominative to "went," of "with great haste" is adverbial to "went." "Grammatical duty" is synonymous with "function." By "idiomatic" is meant a construction that is characteristic of some special language or languages, not always capable of logical justification. For example, while we say, "He *is* right," the French say, *Il a (has) raison*, which constitutes, from our point of view, a French idiom. Similarly we say, "I *had rather* be a dog and bay the moon," etc., in which the construction *had rather be* constitutes a phrase peculiar in construction to English, and is, therefore, termed "idiomatic."

Science.

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

CHEMISTRY.

SOLUTIONS TO PROBLEMS ON SENIOR LEAVING PAPER OF 1894.

1. (b)  $2\text{NH}_3 + 3\text{O} = \text{N}_2 + 3\text{H}_2\text{O}$   
 34 grammes of  $\text{NH}_3$  produce 2 grammes N and 54 grammes  $\text{H}_2\text{O}$   
 1 gramme of  $\text{NH}_3$  produces  $\frac{1}{17}$  gramme N and  $\frac{3}{17}$  grammes  $\text{H}_2\text{O}$   
 $\frac{5}{17}$  grammes  $\text{H}_2\text{O}$  at  $0^\circ$  and  $760^{\text{mm}}$  occupy  $\frac{5}{17}$  c.c. (approx.)  
 28 grammes N at  $0^\circ$  and  $760^{\text{mm}}$  occupy 22400 c.c.  
 $\frac{1}{17}$  gramme N at  $0^\circ$  and  $760^{\text{mm}}$  occupy  $\frac{22400}{17} \times \frac{1}{17}$  c.c.  
 Add these results.  
 Other parts of question similarly.

2.  $42.86 : 57.14 :: 1 : 1.34$   
 (a)  $27.27 : 72.73 :: 1 : 2.66$   
 If in first case C and O unite atom with atom, the relative atomic weights are 1 to  $1\frac{1}{3}$ .  
 The same relation exists if in the second case 1 atom of C united with 2 atoms of O.

This is the simplest assumption, and the relative atomic weights, therefore, become 1 :  $1\frac{1}{3}$ .  
 (b) Since the amount of O, uniting with C in the second case, is twice the amount which unites in first case, the law of multiple proportions holds good.

(c) The atomic theory states that chemical union takes place between atoms. If atom united with atom, then the proportions ascertained by analysis would be the proportions existing between the weights of the atoms. If an atom of one element united also with two atoms of another element, then the weight of the last element would be twice the weight of this element found in the first compound. This the above figures show to be true, *i.e.*, facts fit in with the hypothesis.

3. 344 c.c. of H at  $0^\circ$  and  $760^{\text{mm}}$  weigh  $\frac{2 \times 344}{22400}$  grammes  
 (a)  $= \frac{148}{1400}$  grammes  
 1 gramme of metal yielded  $\frac{148}{1400}$  grammes H  

1400	"	"	"	43	"	H
1480	"	"	"	1	"	H
<i>i.e.</i> , 32.5	"	"	"	1	"	H

Now, if 1 atom of the metal displace 1 atom of H, then 32.5 becomes atomic weight of metal if 1 = atomic weight of H. If 1 atom of metal displace 2 atoms of H, then 65 becomes atomic weight of the metal.

To decide:  
 Specific heat  $\times$  atomic weight = 6.25 (Dulong and Petit)  
 $.0956 \times \text{atomic weight} = 6.25$   
 $\therefore \text{atomic weight} = \frac{6.25}{.0956} = 62 +$

This leads us to choose 65 above.  
 (b) There is an evident error in this question. The specific heat of mercury is .032.  
 Specific heat  $\times$  atomic weight = 6.25  
 $\therefore \text{atomic weight} = \frac{6.25}{.032} = 200$  approx.

If in mercurous chloride the elements unite atom to atom, then 71 parts by weight of chloride would unite with the atomic weight, *i.e.*, 200 of Hg., and 71 becomes the atomic weight of chloride.

If in mercuric chloride two atoms of chloride unite with 1 atom of Hg., then 17.75 represents the atomic weight of chloride, Hg. being 200 (derived from a consideration of the specific heat). The whole question is wrong in fact, but may be utilized as a test of reasoning.

Molecular weight of hydriodic acid =  $28.88 \times 4.43 = 127.9$ ; of this 99.2 per cent. is iodine, *i.e.*, 126.9 and hydrogen .8 per cent. = 1.00.

If in hydriodic acid H and I combine atom to atom, and if atomic weight of H be 1, the atomic weight of iodine becomes 126.9.

Molecular weight of phosphorus triiodide  $28.88 \times 14.27 = 412.11$ , of which 92.5 per cent. or 381.2 is iodine. This amount is noticed to be almost exactly 3 times the amount of iodine in the first compound, *i.e.*, 3 times 126.9. It is not unreasonable,

then, to suppose that chemical union in the first case takes place as indicated, and that in the second case 3 atoms of I go into combination.

The atomic weight of iodine would then become 126.9.

N.B.—Molecular weight = the constant  $28.88 \times$  vapor density referred to air.

ANSWERS TO CORRESPONDENTS.

SENIOR LEAVING STUDENT, Harriston.—(1) Would you kindly give solutions to the chemistry questions for Senior Leaving, 1894?

(2) Give fully the distinction between a monocotyledonous and a dicotyledonous stem as to tissue and structure.

ANS.—(1) See another column. (2) The tissues found in both di- and monocotyledonous stems are practically the same. The main difference between these stems is the arrangement of the various tissues. Taking a sunflower stem as a type of a dicotyledon, the following is the arrangement of the tissues from the periphery to the pith:

1. The epidermis with multicellular hairs projecting outwards, a single layer of more or less cuticularized parenchyma cells.

2. A band—several layers wide—of collenchyma tissue.

3. A band of parenchyma with resin passages. 1, 2, 3 form the cortex.

4. Vascular bundles in a ring around the stem. These consist of the following tissues from the outside, in: sclerenchyma or hardbast, softbast, cambium composed of parenchyma, xylene consisting of vessels and wood fibres. In the softbast is found sieve tissue.

5. Pith composed of parenchyma. Taking the stem of the Indian corn as a type of a monocotyledon, there is (1) an irregular epidermis, (2) below (*i.e.*, inside of) 1 are irregular groups of sclerenchyma. (3) A mass of parenchyma forming the groundwork of the whole cross-section, and embedded in this irregularly are the vascular bundles consisting of sieve, pitted and spiral cells, and parenchyma.

THE ENORMOUS SUN, ARCTURUS.

If the earth were situated midway between the sun and Arcturus, it would receive 5,198 times as much light from that star as it would from the sun! It is quite probable, moreover, that the heat of Arcturus exceeds the solar heat in the same ratio, for the spectroscopy shows that, although Arcturus is surrounded with a cloak of metallic vapors proportionately far more extensive than the sun's, yet, smothered as the great star seems in some respects to be, it rivals Sirius itself in the intensity of its radiant energy.

If we suppose the radiation of Arcturus to be the same per unit of surface as the sun's, it follows that Arcturus exceeds the sun about 375,000 times in volume, and that its diameter is no less than 62, 350,000 miles! Imagine the earth and the other planets constituting the solar system removed to Arcturus and set revolving around it in orbits of the same forms and sizes as those in which they circle about the sun. Poor Mercury! For that little planet it would indeed be a jump from the frying pan into the fire, because, as it rushed to perihelion, Mercury would plunge more than 2,500,000 miles beneath the surface of the giant star. Venus and the earth would perhaps melt like snowflakes at the mouth of a furnace. Even far-away Neptune, the remotest member of the system, would be bathed in torrid heat.—From *Virgo and her Neighbors*, by Garrett P. Serviss, in *The Popular Science Monthly*.

Dr. Thomas Arnold was confessedly the greatest teacher England has ever produced. And he was the greatest, not because he made boys understand quadratics best, or rendered them most capable in translating a difficult Latin text or scanning a subtle Greek verse, but because he impressed upon their souls new and noble ideas of manhood, of truthfulness, of purity, of honor, of helpfulness, of lofty and abiding attainments. His students went forth with the fixed and resolute purpose to be something and to do something among their fellows.—*Christian at Work*.

J.B.—

"Five times outlawed had he been  
 By England's King and Scotland's Queen."

The sentence is simple declarative, subject, "he"; verb, "had been outlawed"; adverb modifiers (1) "five times," and (2) "by . . . Queen" (agent).

"The weeping willow streamed its branches,  
 Arching like a fountain shower."

The sentence is simple declarative, subject, "willow," modified by "the weeping"; verb, "streamed"; direct object, "its branches"; "arching . . . shower," grammatically modifies "branches," but has, likewise, an adverbial relation (of manner) to the statement "streamed its branches." "Arching" is an imperfect participle of "arch," in attributive relation to "branches"; "like" (originally adjective) may be treated as a preposition governing "shower."

T.L.B.—The parsing of the "but" and "like" was treated in special articles in THE JOURNAL, to which you must refer as basis of the treatment. The words have, in many cases, passed beyond the realm of parsing, which is a foolish attempt to shove into eight classes the infinite shades of meaning that words hold in our very subtle language. Unsatisfactory as it is to say so, I will briefly indicate the value of the words in the following sentences: (1) "He would have prospered but for an accident," preposition; (2) "Thou art but as the wave," adverb; (3) "Became but so many words," adverb; (4) "It is but too evident," adverb; (5) "What hand but would cull," a conjunction doing duty, through the omission of the subject, for a relative pronoun; (6) "No way of escape except across deserts," preposition; (7) "Which deep-browed Homer ruled as his demesne," conjunction joining on a contracted clause; (8) "The theory is wrong as far as regards its origin"; "as" is a conjunction joining in the clause "regards its origin," in which the impersonal verb "regards" is the predicate, subject (one, it, etc.) is understood; (9) "I felt like some lone watcher of the skies," adjective.

In the sentence, "Where is he?" "where" is an adverb. When we say "I know not where he is," we see that the "where" has likewise a conjunctive force, so that there is justification for speaking of conjunctive-adverbs or adverbial conjunctions, as you please.

In the sentence, "When to the flowers the Father gave a name, a little one came back," etc., "when" has a distinctly adverbial force of time. "There is a road between Ottawa and Toronto," "and" of course, is a conjunction; what do you suppose it is? Its function is not different from "He gave some to James and John," though the shade of meaning differs in the two sentences.

SUBSCRIBER.—(1) "I want to go to school," "go" is infinitive, depending by means of "to" on the verb "want," which it "modifies" adverbially. (This is the historical view. There is, however, no serious objection to calling "to go" the infinitive, direct object of "want.") (2) "I shall go to town," "go" is infinitive, forming, with "shall," the future tense verb-phrase. (3) "Having taken steps to prevent a failure," etc., "to prevent" is the infinitive, or, more properly, the gerundial infinitive (infinitive of purpose), depending adverbially on the participial phrase "having taken" (steps). (4) "Against him the cattle stood black every one, to stare through the mist," etc., "black" is predicate-adjective after "stood," qualifying "cattle"; "to stare" is gerundial infinitive depending on "stood." (5) "He represents his master to have been an immoral man," "to have been" is the perfect infinitive of the verb "be." As the sentence stands, it holds adverbial relation (manner) to "represents." Note, however, there is a relation of subject and verb in "man" and "to have been" (cf. "that he was," etc.). (6) "Your glorious standard launch . . . to match another foe," "to match" is gerundial infinitive depending on "launch." (7) "He walked a mile," "mile" is adverbial objective noun, modifying (distance) "walked." (8) "That rain made the harvest grow" (cf. 5); "harvest" is direct object of "made," "grow" an infinitive depending on "made," which it modifies adverbially, the word "harvest" bears as well a subjective relation to "grow" (cf. "that it grew"). (9) "Let it be." "Be" is the infinitive of the verb, depending on "let," the two forming an imperative verb phrase.

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## Editorials.

### AGRICULTURE AND BOTANY.

FROM the juxtaposition of the closing part of Inspector Dearness' article, which has run through two preceding numbers, with that of Mr. Stevenson, some of our readers may get the impression that we are giving an undue proportion of space to topics connected with agriculture. We may, therefore, explain that it is by accident that two articles, touching to some extent on the same subject, appear side by side. Nevertheless, we feel sure that both will be read with interest and profit by wide-awake teachers. There can be no doubt, we think, that the subject of agriculture, with related sciences, must very soon have a much larger place in our school programmes than has yet been given to it. The information given in Mr. Dearness' paper, with regard to what is being done in the way of agricultural instruction in the schools of other countries, is suggestive in this direction. Moreover, it is obviously highly desirable that all teachers, especially all teachers in rural schools, should be well informed on such points, and should also have a good practical knowledge of the science and art of farming, if they would preserve the respect of their pupils, and wield a healthful and helpful influence in the right direction, by arousing a deeper interest in the minds of

the children in what is, perhaps, the noblest and most indispensable of all industrial pursuits.

Mr. Stevenson's article is, in many respects, original and suggestive. It abounds in hints that can hardly fail to be of great value to the teacher who will study them thoughtfully, and put them into practice. The paper is a condensation of that read before the Science Section of the Educational Association a few weeks since. By the way, our apologies are due to Mr. Stevenson for having neglected to publish in a previous number the following note, which explains itself:

To the Editor of THE EDUCATIONAL JOURNAL:

DEAR SIR,—In your excellent report of the recent meetings of the Ontario Educational Association, I observe an error of statement regarding the paper I read on "A Wider Botany." What I said was not that botany, as a means of culture, was superior to language and literature, but that it ranked *next* to these subjects in that regard.

A. STEVENSON.

The High School, Arthur.

### THE EDUCATIONAL VALUE OF VOCAL MUSIC.

WE frankly confess that we do not know enough about the subject to feel qualified to express an opinion upon the views put forward in the following paragraph, which we clipped some time ago from *The Educational Exchange*. The ideas seem to us somewhat original, and as if there might be "something in them." At any rate they are worth thinking about, especially just now when the proposal to give vocal music a place in the programme of our Public Schools is said to be under consideration:

The importance of vocal music in school training has not been, in the past, adequately appreciated. The want of appreciation is largely due to the unsatisfactory results secured by past efforts, and this fact, in turn, may be attributed to the manner in which instruction in this subject has been conducted. Upon the introduction of vocal music into the school curriculum, one important fact has been generally overlooked, namely, that this subject should be taught for the same general purpose and in the same manner as any other subject in the course. Usually it is set aside as a special topic for special pupils, taught by a special teacher. When it is decided to place music on the programme of the school, trustees and boards of education immediately begin to look around for a musician to give the instruction. That is a fundamental mistake. They should look first for a good teacher, and then let that teacher have an opportunity of learning vocal music, then it will be possible to deal with this subject as with the other subjects in the course. Within the past few years, the experience of the large

Public Schools of the country has demonstrated the superiority of the regular class teacher to the average professional music teacher in securing the best results in vocal music instruction. The subject should be taught, not simply for the purpose of making musicians, it should be taught for the same reason that arithmetic, geometry, and Latin are taught. Mental culture should be the principal aim, and all other aims should be subordinate and incidental. Vocal music is peculiarly adapted for securing a combination of the thought element and executive skill. No other study makes imperative the time element in its relation to thought as does vocal music. In mathematics and Latin habits of thinking may vary as to the time required, but, in vocal music, tone perception and its expression must be instantaneous and practically simultaneous. The problems of life require for their solution the elements of rapid thinking and prompt expression, and by its very nature vocal music tends to secure these desirable results. All other aims secured by school instruction in music, such as the pleasure and satisfaction derived by the pupil himself, or given to others, and the disciplinary influence of this kind of training upon the school, must be treated as incidental, though desirable, results, while the chief object in view must be the preparation of the pupil by the mental discipline derived for the practical activities of life.

### INFORMATION WANTED.

IT is not improbable that four or five of our subscribers are thinking uncomplimentary thoughts about THE JOURNAL, through no fault of ours. It sometimes happens that, in a moment of carelessness or absent-mindedness, one will sit down and write a business note to a newspaper or firm, enclosing money for some purpose, and then proceed to seal and mail the same without signature or indication of any kind which will enable the person receiving it to discover the sender. We have now on hand the following sums, which have been received at different periods within the last few months. Some of them have already been once or twice advertised in our columns, but without effect:

In August, 1894, we received a note dated from Thistleton, enclosing fifty cents for certain books specified. No signature.

In October, 1894, a lady called at the office and ordered two books, for which she paid, taking one of them with her, and ordering the other to be sent to her. As she left no address, we have, of course, been unable to send the book or communicate with her.

In March, 1895, we received a note dated at Peterboro, enclosing a sum of

money in payment of subscription, and requesting that the paper be discontinued, as the writer had given up teaching for a time. The note had no signature, consequently we are unable either to credit the money or discontinue the paper.

In April, 1895, we received an envelope with an illegible postmark, which contained twenty-five cents in postage stamps, but nothing else. Of course we have the stamps, but cannot know to whom or for what we are indebted for them.

We have just received a note from Prince Albert, Sask., ordering a copy of a certain book, and enclosing fifty cents in payment, but giving us no information as to the person who wants it, being without signature.

We shall be glad to hear from the owners of the above funds. The moral is, always sign your letters, especially when money is enclosed, unless you wish to make it a present to the editor. Even in that case he would be glad to know the name of his benefactor.

#### THE MANITOBA SCHOOL QUESTION.

A CORRESPONDENT of the Question Drawer, whose other questions come to hand too late for this number, requests us to continue the history of the Manitoba school question up to date. Whether the question is any nearer a satisfactory settlement now than it was at the date of our last sketch, March 1st, it is difficult to say. Though it has been kept constantly before the country in one way and another since that date, the really important stages through which it has passed are few, yet by no means unimportant.

Our previous sketch brought the history up to the point at which the decision of the Judicial Committee of the Imperial Privy Council, affirming that the Roman Catholic minority had suffered a grievance through the passing of the Manitoba School Act abolishing Separate Schools, and had, consequently, a right to appeal to the Governor-General in Council for redress, had been transmitted to Ottawa. The Dominion Government, *i.e.*, the Governor-General in Council, had fixed a day for hearing the case. Having heard, on the appointed day, the arguments of counsel representing both parties, *viz.*, the Roman Catholic minority and the Manitoba Government, the Dominion Privy Council—which is but another name for the Government—passed an order, reciting the decision of the Judicial Committee of the British Privy

Council, and calling upon the Manitoba Government, in the terms of that decision, to restore to the Catholic minority the rights in regard to Separate Schools of which they had been deprived.

A very interesting phase of the discussion was caused by the electoral contest in Haldimand, consequent upon the acceptance by Dr. Montague of the office of Secretary of State in the Government. This rendered it necessary for him to go back to his constituents for re-election, as a token of their approval of his acceptance of office. His election was contested. During the very animated political campaign which followed, the Honorable Mr. Sifton, the Attorney-General in the Manitoba Government, visited the constituency and spoke in defence of the present school system in his Province. In so doing he dwelt mainly upon what he represented to be the glaring inefficiency of the Separate Schools as they had existed up to the time (1890) when they were abolished by Act of the Legislature, and the present system enacted in their stead. His forcible statements of alleged fact touching the causes of the change which has brought about the present state of affairs attracted considerable attention. Nevertheless, Dr. Montague was re-elected by a large majority.

Pending the reply of the Manitoba Government, and the action of its Legislature upon the Order in Council of the Dominion Government, no further official steps have yet been taken by the latter, and the question has not been brought before Parliament. A somewhat unusual incident has, however, taken place in the meantime. His Excellency Lord Aberdeen, the Governor-General, intimated his wish to have a personal interview with the leader of the Manitoba Government, with a view, it is presumed, to seeing whether some mutually acceptable way out of the difficulty could not be found. It will be borne in mind by our readers that, under the system of responsible government which our people obtained with so much difficulty a half-century or so ago, and which we prize so highly, the Governor-General, representing the Imperial authorities, can of himself take no action whatever in any matter affecting the Government of Canada. He can act only on the advice of his constitutional advisers, *i.e.*, the Government of the day. Consequently, anything which passed during the interviews between His Excellency and Messrs. Greenway and Sifton, the Premier and Attorney-General of Manitoba, who came to Ottawa in response to his invitation, and had several conversations with him

upon the school question, could be only informal on his part, binding neither the Government nor the country. What took place during those interviews has not been made public, nor is it known whether any course of action or policy was agreed on. It may transpire that the suggestion of the appointment of a commission to inquire into the whole matter, which suggestion is made in the answer of the Manitoba Government to the Order in Council—of which we are about to speak—is a result of these informal talks with His Excellency, but that cannot at present be known.

The Manitoba Legislature, which had adjourned for a few weeks in order to give the members time for full consideration of the Remedial Order which had been passed by the Dominion Privy Council, pursuant to the decision of the Judicial Committee of the British Privy Council, the highest judicial authority in the realm, adjourned again until the 14th of June, in order to give its members ampler time for consideration of the very serious matter upon which they are obliged to take action. Pursuant to this adjournment, the Legislature met yesterday. Premier Greenway was, in consequence of indisposition, unable to be present, but the answer proposed by his Government, to be sent to the Dominion Government as a reply to the Order in Council, was made known. That answer, which will be formally considered in the Legislature on Monday, the 17th inst., has been published in the leading newspapers, and probably seen by most of our readers. It is, in substance, a respectful refusal to obey the order, which order it understands to mean that the system of Separate Schools which was in existence prior to 1890 must be restored. It contains also a statement of the reasons which, in the judgment of the Manitoba Government, render it inexpedient or impossible for it to comply with the order. The document further implies that the Order in Council must have been passed in ignorance of the true state of affairs which existed in Manitoba up to 1890, and which led to the passing of the Act of that date, and suggests the appointment of a commission to inquire into the whole history of the matter.

Thus the serious question stands at the present moment.

A supervisor, who is not delighted to find that a teacher has discovered something new, something he never thought of himself, fails utterly in one indispensable qualification, the power to stimulate creative thought and independent investigation.—*Parker.*



## Special Papers.

### A WIDER BOTANY FOR HIGH SCHOOLS.

BY A. STEVENSON, ARTHUR.

By far the greater number of the pupils of High Schools do not continue their studies beyond the primary examination. It is wise, therefore, to arrange that the character of the instruction up to this stage should have direct practical bearings, so far as these can be attained without sacrificing general educational values.

Now, botany is treated in our High Schools, for the most part, only as a pure science, and as a discipline of the intellectual faculties. We neglect the means which the material affords for the cultivation of taste and feeling, and we ignore the applications of the study to the facts and processes of agriculture and horticulture.

But, in the first place, as our pupils are not beings of pure intellect, there are wants in their natures which cannot be satisfied by the intellectual results of science, and knowledge alone does not suffice for happiness. Moreover, by the development and cultivation of the finer feelings, we may prevent the minds of our young people from being taken up with many vulgar ambitions and pitiful vanities.

Next to fine literature, botany is the subject on our school programme along with which can best be given some measure of æsthetic cultivation. Pupils should be taught not only to understand the matter they are dealing with, but to appreciate it, that is, to feel it and enjoy it, and so to be permanently influenced in character by it. Let us cease to regard a plant as merely an aggregation or organization of cells of various forms and functions. Let us anoint our eyes, that we may see that a plant is a perfection of nature, a thing of beauty, and a joy forever. Truly, Solomon in all his glory was not arrayed like one of these!

Nature provides a rare pleasure for all classes of people whose minds have been turned to the observation of plant life as a source of interest and happiness. We cannot do a greater service to those who are soon going out of school into any sphere of life than to develop their tastes in this direction. Let our young people learn to look more and more for their pleasures to the woods, the fields, and the garden.

In that delightful and very refreshing book, "My Summer in a Garden," the author regards a common vegetable garden not only as a source of great pleasure, but also as a real means of grace, inasmuch as time spent there tends to the eradication of certain moral defects and the development of various excellencies. No doubt, Mr. Warner is right. Gardening recreates the weary brain, and revives the weary soul of the careworn man of affairs, either in business or in professional life. Nor does it really matter very much, in many cases, whether the owner of the garden gets a money value out of it equivalent to the labor and expense he puts on it. He is well repaid in satisfactions of a subtler nature than money can buy.

The lives of our future farmers, too, would be much easier and pleasanter if in their school days they could get such instruction in botany, and have such a direction given to their taste and observation, that new interests would be brought into their lives, and new pleasures gained from the objects that surround them. For many young men leave the farms and crowd into the cities, and others remain dissatisfied at home, because of what seems to them the entire unloveliness of their surroundings on the farm, and of any reasonable ground for interest therein.

The elements of beauty in plants are color, form, structure, and adaptation of parts. Formerly botanists were inclined to ignore, if not to despise, color, because it was of little or no service to them in classification. Yet leaves, and flowers, and fruits do not exist for the sake of classification alone, and in many cases color is the chief element in their beauty, and in the pleasure they give to mankind. Now, too, when we know how useful to themselves and to us in contributing to fructification and distribution are the bright colors of flowers and fruits, our pleasure therein is immeasurably heightened.

As to the appreciation of beauty in form, there is a considerable measure of æsthetic cultivation to be derived from the practice of making drawings from

nature of the parts of plants. To be effectual in this regard, however, the work should be better done than is usually the case at the present time.

Little can be done in the study of structure for æsthetic ends without the use of the microscope. Philosophers recognize wonder and admiration as the foundation of all human development whatsoever, and any means, therefore, of arousing these feelings must be regarded as of great value for educational purposes. The beauties and wonders in plant structure which are revealed by a simple lens appeal to even the dullest and lowest minds. And what a revelation of a new world—a new heaven no less than a new earth—is opened up to a pupil when he first looks through a compound instrument at a mere jagged splinter of firewood, or a fragment of onion or potato, or a leaf of the wayside weed he has so often trodden on and despised!

A perception of the adaptation or fitness of parts increases very much our appreciation of the appearance of plants. This is not much dwelt on in our classes, and yet in the case of many plants we have little but the dry bones of the study left if we neglect to take up the exquisite interrelations of color and form, on the one hand, with function on the other. Moreover, nothing else is capable of arousing so deep an interest in botany as a study of the modifications that have taken place, and are taking place, both in form and color and in function, and of the influence of heredity and environment in perpetuating a variation once entered upon. The introduction of the theory of evolution into High School botany classes has the same enlivening and energizing effects as it had in the scientific world outside.

Some may consider that the features of plant study so far advocated are outside of the practical applications of the study of botany as advocated at the beginning of this paper. But it is not so. The results here to be sought are most practical. For beauty is a use, and the highest of uses, and the satisfactions obtained therefrom are among the most practical values in life, if not always on the market.

In the second place, it is obvious that great advantages would result from making our teaching of botany more practical in the ordinary sense of the word, that is, from making our class-work bear more directly upon the orchard, the garden, and the farm, and the processes and results of the culture carried on there. And if we make our study, not one of observation merely, but one of wide and varied experiment also, so much the better.

Opportunities for giving the teaching of botany a practical turn come frequently, if one is on the lookout for them. Let me illustrate from personal experience. In my district, the ashman is a common sight. We learn that the ashes he gathers are shipped to dealers in the United States, and we see them extensively advertised in American agricultural journals as "Canada Unleached Hardwood Ashes." In seedsmen's catalogues they are quoted at \$20 a ton, and are recommended as the best of fertilizers for certain crops, as fruits, potatoes, and corn. We now learn that these ashes contain plant food, which the original trees obtained from the earth. We also learn that the most valuable elements of plant food present in ashes are potash to the extent of about six per cent., and phosphorus about two per cent., of the whole quantity of ashes. Now, it does not take a very sharp boy to see that if it pays the Americans to give a dollar a hundred for our ashes to fertilize their crops, it certainly is folly for us to sell them at ten cents a hundred, so long as we have anything that needs fertilizing.

Again, we have been selling an immense quantity of hay for the English market during the past year. Prices have been fair, and the uninstructed farmer looks upon the business as profitable. But we got a bulletin recently from the Ontario Department of Agriculture which shows that for every ton of hay the farmer hauls off his farm he is taking away 25 lbs. of nitrogen, 18 lbs. of potash, and 10 lbs. of phosphoric acid, and that these materials are worth, in current market values, for fertilizing purposes, just \$5.50, so that the imaginary profits entirely vanish, and the farmer is seen to be impoverishing himself by robbing the soil of its most valuable supplies of plant food.

We learn, too, from the same circular, that at present prices of wheat and barley grain-farming is almost as unprofitable as hay-farming, since the nitrogenous and mineral constituents that are taken off the farm when these are sold are worth about forty per cent. of what the farmer re-

ceives for his crop. It strikes a country pupil forcibly, as a cheerful contrast to all this, to be shown that the farmer who is wise enough to concentrate his energies in producing fat cattle or milk for the cheese factory loses in soil fertility only about ten per cent. of his receipts. But he is struck even more forcibly with the fact that the farmer who sells neither hay nor grain, nor fat cattle nor milk, but cream and cream only, as some are now doing where creameries are located—that this prudent farmer loses in soil fertility only a trivial one-tenth of one per cent. of his receipts for sales. For as butter contains neither potash nor phosphorus, and only a very small fraction of nitrogenous matter, the butter-farmer's soil is never exhausted. The cow now appears in the interesting light of a most wonderful apparatus for converting carbonic acid and water into gilt-edge butter. The plants on which she feeds absorb the carbonic acid from the inexhaustible reservoir of the air, and the cow manufactures it into butter globules ready for the churn.

From various sources we learn that plants require large quantities of nitrogenous matter, and that soils are usually deficient in this valuable ingredient, which also is exceedingly expensive to procure in its chief commercial forms of guano and nitrate of soda. But science has lately shown us that leguminous plants have the property of absorbing free nitrogen from the air and fixing it in their tissues. So now we may grow clover to gather nitrogen for us, and, plowing this clover down, we have a fine supply for whatever crop we wish to grow thereafter.

In dealing with the varied conditions of plant life, many useful illustrations may be drawn from the methods of scientific agriculture. Among the matters to be taken up are the advantages of drainage and of subsoiling, and the recent discoveries that flat culture is better than ridged for root crops and for corn, and also that the evil effects of drought may largely be averted in cultivated crops and in orchards by frequent shallow culture, by which means the top layer of soil, being kept loose and open, acts like a mulch in conserving moisture.

When we are treating of the effect of light on plants, we might go on to show that, in certain cases, it is an economic advantage to have light excluded, either by developing and fostering an artificial habit of the plant itself, as in the cabbage, or by other methods, as in the celery. Most interesting of all is the fact that to get the highest percentage of sugar in the beet, the tops of the roots must be kept covered with soil.

The processes of pollination and fertilization are matters of intense practical interest. The cucumber and the strawberry plant, we all know, furnish fine material for illustration. But it is not so generally known that cross-fertilization from other varieties is necessary for a good crop of some apples and pears, as the Bartlett, for example, although the fertilized varieties themselves have perfect flowers.

The enormous waste of plant energy in the great production of pollen by wind-fertilized plants is well shown by the results of four years' experiments with Indian corn at Cornell University. By plucking out the staminate flowers from every alternate row, not only was there enough pollen produced on the other rows to fertilize all the plants, but the yield of the whole was increased nearly twenty per cent.

Darwin discovered long ago that atrophy of seeds was frequently accompanied by a gain in size and quality of the fruit as a whole. It is interesting to know that it is now an object of ambition among scientific fruit-growers to develop varieties with small seeds or none. Recent triumphs in this direction are the Navel seedless orange and the Lincoln coreless winter pear. The proportion of pulp to seeds has been greatly increased also in raspberries and tomatoes.

Our young botanists ought to be so instructed in the principles of variation and heredity that they would be on the lookout for useful variations, and know how to propagate and improve any useful variety they might observe. No more interesting or useful object could be set up before the minds of our young botanists than some achievement of this nature.

He would be a public benefactor to an extraordinary degree who should obtain a variety of Fife wheat which would mature a little earlier in Manitoba, so as to escape the September frosts. It would be a benefit, too, to develop a tomato, or a

melon, or a Lima bean, that would mature anywhere in lower Ontario, or a variety of strawberries that would mature a fortnight earlier or later than those varieties we already have, and so extend the season of our enjoyment of this most luscious fruit.

The improvement of some of our wild plants offers a wide field for usefulness. Some aspiring young Canadian botanists might be encouraged to take hold of the May apple, for instance, and see what could be done with it. Most of us know what a rich flavor the fruit of this plant has, and also how scarce the fruit is. If a study were made of the conditions under which the plant thrives best by judicious culture and selection, we should probably be able in time to increase the productiveness of the plant and the size of the fruit.

Though we cannot do this work itself in schools, we can, at least, give the minds of our young people a set in this direction, so that they may do some such work afterwards.

## AGRICULTURE IN THE PUBLIC SCHOOLS.\*

BY INSECTOR DEARNESS, LONDON.

(Concluded.)

Gentlemen, do you agree with me that education by the scientific method in the sciences that subserve agriculture and domestic economy, and in those parts that serve these arts best and most, is what we need in our schools? Then inaugurate a propaganda to educate the public to require *method* as well as matter. The system of written examination in vogue might test how much of a text-book in agriculture the children had memorized, but it cannot test how they are being taught to observe scientifically. That was a capital paper by E. A. Powell, in last June 15th—August 15th of the *Farmers' Advocate*. I hope you all read it. You may remember his argument that readjustment of the Public School courses of study will enable us to make farming much more profitable; that the "study of horticulture and biology will aid materially in this direction, but there is quite as much advantage in chemistry and in farm economics. Farming will pay when it is done understandingly, intelligently, lovingly, with a knowledge of the forces we deal with and the things we handle. At present the bugs understand us better than we do them. They have little to learn, but they have learned that little well." He proceeds to show that "one-half the production of American lands is lost through ill-directed education. Our apple crop is more than half lost, and this is pretty surely true of all other fruits, except, perhaps, small fruit, which cannot be grown at all, except with special attention. The plum trees, over large areas of the Northern States, have been cut down, or ought to be, to get rid of the black knot. The cherry trees were also assailed fifty years ago, and gradually eliminated by the same disease. The curculio spoils yearly tens of thousands of bushels of both these fruits. Remedy—more knowledge of entomology and of tree life itself. Give that, and the snap and backbone will be found. The farmer is rarely a lazy man. His trouble is, he does not know his enemies, or how to fight them. He does not know his friends from his foes in the insect world and is as likely to destroy the former as the latter." He enquires how this desirable result can be obtained. How can we secure for our rural schools teachers competent to teach geology, chemistry, biology, and physics? He answers this question thus: "When the demand comes, we shall surely have the supply. But let us not make the mistake in supposing these to be more abstruse or difficult studies than geography, arithmetic and grammar. Rightly taught, these latter are far the most difficult and advanced; they belong only with older pupils. The former sciences are simpler and more fundamental. They deal with everyday questions and things near at hand. Science, as entomology for instance, deals with butterflies and bugs—just what children naturally take to. Science, as botany, deals with flowers, fruits, roots, trees—just what all children like. Science, as geology, deals with the dirt and stones and brook-beds—just what children love. Science, as chemistry, pulls things to pieces and reconstructs; as physics, it plays with sunbeams. This is not at all abstruse. We want just as little as possible to do with books while educating a child."

\*A paper read before the Central Farmers' Institute, Toronto, February, 1895.

Develop a strong sentiment in favor of nature study in the schools, and that sentiment will demand competent teachers. The present ruling question, "Who will teach our school the cheapest?" will give way to, "Who will give us the best value for what we can pay?"

Mr. Powell, quoted before, says:

"So utterly impossible has it been for myself to secure my children what I call a rational education, that I have done what I regret many more do not do, or cannot do—built a laboratory and employed private tutors. Here they enjoy, with a zest, drawing, geology, biology, chemistry, mathematics, and music, with, as far as possible, field work. These studies are followed by a general knowledge of life on the globe as well as the history and science of human language and thought. At this point geography becomes a rational part of education. The result has been more than satisfactory. They love the land, and the things of the land. I am confident they will never consider land culture inferior to traffic. Their minds are here because their acquaintances are here. Their souls are with the birds, the plants, the animals, the bugs."

The sentiment I speak of will give us not only trained teachers but the necessary means and appliances for doing the work properly. There must be apparatus and materials; fortunately, they are inexpensive. I have spoken of the outfit at \$4, to be furnished each of the Manitoba schools, and they are also to receive a set of colored charts of plants and animals. A compound microscope, as well as a simple one, should be added. Then, the school-garden, with gardening implements, is almost indispensable; a little plot convenient to the playground, but better not a part of it, where germination, growth, fertilization, and even hand-pollination, grafting, and budding may be observed and practised. Could not the agricultural societies give prizes to encourage school-gardening? I see no difficulty in the way if the competition were limited to townships or inspectorates.

I have said so much against text-books that I ought to make it clearly understood that I am not opposed to seeking assistance from books. On the contrary, every school should have a few science reference books. I oppose those lesson books being placed in the children's hands, liable, almost certain, to be learned by rote. I favor books that are investigation guides. Of the latter, as being the best I know, I have laid on the table Howe's Systematic Science Teaching, Jackman's Nature-Study, Harlam Ballard's World of Matter, Spalding's Botany, and Colton's Zoology. These and, doubtless, others I do not know of should be within every teacher's reach. It is, however, easy to see that a graded series of, say, two or three small books—scientific investigation guides—prepared expressly in the interest of agriculture, would be different from any of the above, although similar in plan to the two first mentioned.

The material for instruction is overwhelmingly abundant; most children start to school with a taste and aptitude for such learning; skilful method on the part of the teacher is the desideratum. "As I write these suggestions (to the teacher) I fully realize the struggle it will cost you to keep silent about all the interesting things there are to be told, but that word 'told' lets out the whole mischief." (Howe's Systematic Science Teaching, p. 167.)

The following is an outline of a course of study that might be taken up in the Public Schools.

**First Class:** Observations upon, and conversations about, common objects, such as utensils, articles of food and clothing, etc.; classification, as of houses, fences, books, etc.; sorting metallic articles, seeds, leaves, etc.; observations on the weather, skies, seasons, etc.; talks about plants, animals, etc., that can be brought to the school, or that the pupils have experience with.

**Second Class:** Observations of which a daily record is made of direction of wind, cloudiness, rain, snow, dew, hoar-frost, etc., and practice in forming judgments upon the observations, as *e. g.*, answering the question "What directions of wind usually bring rain?" sorting objects, as fibres, minerals, etc.; classifying objects, as tools, plants, animals, on the basis of their uses; observations on the seasons, changes of the moon, position of the sun; elementary systematic instruction with objects at hand upon seed, leaf, flower, fruit, etc.; geography of the school-ground and neighborhood.

**Third Class:** Observations on weather, temperature, changes of the seasons, recorded daily and judgments deduced therefrom; migrations of birds;

habits of animals; classification of woods, soils, fruits; comparison of minerals as to qualities, such as hardness, lustre, etc.; plants continued, description, development, and function of organs, relation of soil, moisture, shade, introducing tillage and drainage; elementary systematic study of the organs of animals; simple experiments in physics and chemistry; local geography of neighborhood, township, county; government of school-section, township, county.

**Fourth Class:** Meteorological record continued, with notes, as opportunity offers, on such classes of facts as the effect of frost on soils, buds, etc.; migration of birds, opening of familiar wild-flowers, first appearance of familiar insects, such as potato-bug, tent-caterpillar, grasshopper, etc.; plants continued, comparison of organs based on examples as various forms of roots, stems, leaves, flowers, fruits, seeds, life history of plants, such as of potato, wheat, strawberry, apple; talks and practice, if possible, on thinning, pruning, grafting; comparison of animals' organs, function, and hygiene; experimental physics and chemistry continued, aiming at teaching the physical properties of matter and simpler chemical facts of air, water, lime, salt, sulphur, etc.; soils and manures.

**Fifth Class:** Meteorology, farm calendar, recording time of operations, times, and effects of unusual cold, heat, drought, winds; observations upon the opening of flowers, setting of fruits and visits of insects: plants, use of key in identifying plants, life histories, observations on injuries from insect and fungal parasites; growth, form, decay of trees; weeds, their means of spreading; entomology, studies (from specimens) of metamorphoses of insects, life histories of insects; physics and chemistry continued experimentally with a view to applications to agriculture; visits, by arrangement, to good farms or to dairies in the neighborhood to study live stock, farm buildings, laying out fields or farm or dairy processes.

If France's experience has a lesson for us, results of great importance should be expected of the High Schools. If these institutions were to devote as much money and energy to teaching scientific agriculture as they do to the preparation of entrants to the professional and commercial pursuits, they would doubly and trebly repay to the agricultural interests the large grants they now receive from the counties, and they would contribute towards a signal increase of the profit and pleasure of life on the farm.

Inspector Smith, of Wentworth, proposed a scheme to set apart one school in each township, to be equipped, at the expense of the township, with an extra teacher, who would give a graduation course specially adapted to farmers' sons. If these classes were established, they should be taught by graduates of the Agricultural College holding a teacher's certificate.

Elementary science, properly begun in the Public Schools, continued and strongly specialized towards agriculture in the High Schools, would increase the attendance of better prepared candidates for our Agricultural College. The present one is admitted on all hands to be doing excellent work. The number of these would have to be increased to meet the demand. This duty would devolve on the government, also, the duty of providing a practical course in the Model and Normal Schools and of sending experts on matter and method to the Teachers' Institutes.

In the paper by Mr. Bryant, first quoted, he argued very cogently that a course in scientific agriculture affords disciplinary training for the mind; it offers scope for aesthetical and ethical training and it is, above all, utilitarian. If to such a course were added reading, literature, and arithmetic, with suitable provision for expression by language, oral and written, drawing, and working in clay and wood; and, in the fourth and fifth classes in the Public Schools, history and world-geography, with good morals acquired by constant practice and incidental precept, with careful attention to the health and growth of the children throughout, then I think we should have an ideal system of education.

I am addressing the most representative body of farmers in the country. Does it not behove the Central Farmers' Institute—the Farmers' Parliament—to do more than listen to the reading of the papers on this most important subject? Can you not issue educational bulletins broadcast throughout the land? Would not a committee, appointed to consider and draft a scheme and confer with the Ministers of Education and Agriculture, stimulate

efforts towards practical results? I tell you what you know, that the people do not take kindly to innovations that they regard as forced on them from the central authority. Lead the people to demand the improvement, then they will welcome it. It was the clamor of the Farmers' Institutes that moved the government of our sturdy neighbor in the Northwest to provide a course of agricultural instruction in the Public Schools. The people now, I am informed, are receiving it with enthusiasm. Let us copy the example of Manitoba in this matter and, although she has the start of us, let us enter into a race with her for the best results.

I conclude with a sentence from Farmer Powell's article, that the all-important point is to have in our schools a curriculum of study that will make our children acquainted with the land, and what is on the land; an education that unfolds the nature of soils, and the wonders of life in and on the soils; and while bewitching them with the everlasting unfoldings of such studies makes it possible for them to master their foes and to receive the benefits of insect, bird, and plant friends. This done, no other occupation can compare with farming for its charms and advantages.

## Mathematics.

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

### CORRESPONDENCE.

W.E.B., Bryanston, does not state the problem. Please give both problem and reference.

A.S., Windsor, sent four problems; the first is incomplete.

R. J. BROWN, Beamsville, sent neat solutions of Nos. 30, 33, 34, 38, 39, 41. Many thanks for the service.

J. M. MCC. sends six "algebra questions." They are so written that the printers could not make them out. Please write out carefully and legibly, and give the name of the book from which they are taken. This latter piece of information often saves a good deal of trouble to those who are kind enough to send solutions.

F. L. BUCKTON, Colchester, sends solutions of Nos. 53, 55, 57, 59, 61, 62, 63, 64. The solution of 53 proceeds to the tenth revolution of the coil, at which point the solver remarks, "Life is too short to work out such a question unless the future of the nation depends on it." Well, it is not such a long problem to those who understand the calculus. The lower methods of analysis break down with such questions. It is worth while for a junior student to find that out by experience. The experience will enable him to appreciate all the more the wonder-working power of abstract thought—of which the calculus is one of the finest examples in the world. Perhaps some of our more advanced readers will take the pains to show how to calculate this involute of a spiral. The question has no connection whatever with the daily work of the Public and the High Schools. Incidentally, it shows how easy it is for a sweet young lady to ask a question that can only be answered by the application of principles of which she cannot at present understand a word. Of the High School teachers of Ontario, only about fifty would be qualified to appreciate the solution of this question. A similar remark holds good with respect to No. 58. Probably there are not 150 people in Ontario who can solve the question. It has been discussed in THE JOURNAL, and the approximations of Halley and others have been given. In the meantime, it lies far afield for the most of our readers, and involves a long journey into the regions beyond, before the principles of the solution can be understood. A child can often ask a simple and perfectly natural question that the wisest man on earth cannot fully answer, and which is totally beyond the child's power to comprehend even if the answer be ever so perspicuous. One cannot help observing the parallel between such questions and the sceptical objections often repeated against Christianity. The thoroughly sound and irrefutable answer is totally beyond the appreciation of the objector, and is practically useless to convince him. In mathematics, as in all

other things, a certain amount of faith in the evidence of competent witnesses is a condition of progress. For example, junior pupils of our schools must take on credit the fact that  $\pi = \frac{22}{7}$ , or more nearly  $\frac{355}{113}$ , or, more nearly still,  $3.14159+$ . Faith is the foundation of both science and civilization; let us accept that fact in its widest sense, and apply it thoroughly to our own lives. To those who have patience, industry, and intellect, faith, by and by, resolves itself into perfect knowledge. Such a consideration reconciles a good thinker to his earthly lot; and such questions as these rather help to stimulate the ambition of earnest minds to keep up the forward march in mathematical knowledge—which will be just as true as ever after all the elements of the material universe have been dissolved. Classics and modern languages are destined to be lost in the roll of æons of ages; but the basis of mathematical science rests on principles as indestructible as the attributes of God Himself, and as long as thinking intelligence exists the abstract principles of mathematics will endure. Ethics and mathematics are the sciences of eternity. Pardon!

THOS. DOWLER, Marshville, Ont., sent solutions of Nos. 54, 55, 57, and 64. He also asks for "easy solutions, with full details as they should be taught to a Public School Leaving class," of six problems in the Public School Arithmetic, pp. 171, 183. We give the problems below. In the meantime, we assure our perplexed correspondent that no sane examiner will set such questions on the P.S.L. papers, nor even on the Primary Arithmetic papers, and that he is firing above the target very considerably. The author of these problems is one of the finest mathematicians on the continent, or on any continent; but the limitation of the work to 198 pages has compelled so much condensation, has excluded so many illustrative examples, has cut out so much explanatory matter, that, by the unanimous verdict of the Public School teachers of the Province, the book requires an enormous expenditure of time and teaching power beyond what ought to be necessary. The shorter the book, the more the teacher has to supplement it; the more he has to construct introductory exercises to lead his pupils up the abrupt precipices, the more the natural difficulties are multiplied. The intention of the volume is right; the aim is to make thorough arithmeticians; but the limitation of space imposed upon the author has made the accomplishment of this aim morally impossible. The teacher who can successfully carry a class over the ground staked out is, *a priori*, capable of writing a supplementary book with three times as many examples, properly graded, and accompanied with the necessary explanations. Teachers who hold first-class certificates have no trouble in teaching the Public School Arithmetic. But they do not use it very much. On the other hand, they are a mere fraction of the whole body who find the book a decided hindrance, and a positive discouragement. The space limitation has ruined its usefulness as an introductory text-book. Long ago THE JOURNAL took an advanced and sound position. *Two books are needed.* One larger than the present P.S.A. for the work up to the end of the Entrance examination, and a Part II. of equal size for the P.S.L. and primary work. Every reasonable educationist must perceive the self-evident character of the proposition. Every teacher who knows what has been done in England and Germany and the United States must feel the force of axiomatic truth in the proposal to divide the Public School Arithmetic into a Junior Part I. and a Senior Part II. If the Minister would offer \$1,000 for the best book and \$500 for the next, and then combine the two, dividing the royalty between the two authors in the same proportion, we should have, before two years, the best Public School Arithmetic on the continent. The thing is entirely possible and practicable; and the principle of competition should long ago have been introduced. Well, as regards this particular book, the teachers are a unit. Why do they not make their opinion felt? Why do they quietly acquiesce? Here is a perfectly practical proposal: Let every teacher in Ontario mail to the Minister on Monday, the 15th of July, a post-card containing a protest against the P.S.A., stating that it hampers the teacher in his work by being altogether too short, and by containing too few examples worked out; requesting also that the book be doubled in extent and divided into two parts, and assuring the Minister

that the best way to get a really good book is to open a competition in which the Public School teachers themselves would have a chance to supply a proper text-book. The receipt of 5,000 protests within a week would serve to open the eyes of the Department to the extent and to the acuteness of affliction under which the Public School teachers are suffering. To those who have not seen the hundreds of letters received by THE JOURNAL telling of the difficulties created by this book, of course the proposal will seem extravagant. But to those who have, it seems the most rational thing that could be uttered on behalf of those who are suffering from the effects of such an incubus upon their daily work. This statement of the case is meant to be clear, emphatic, and entirely free from unnecessary harshness. If the suggestion does not commend itself as rational, peaceable, and effective, we hope there is no harm done to any vital interest concerned.

J. PATTERSON, Sweaburg, Ont., sent solutions of Nos. 54, 55, 56, 59, 60, 61, 65, 66, 67, 68, 70, 74, 79. We feel proud to give credit for the work done by our new correspondent. It is another of the little signs that indicate how much nearer the teachers of Canada are drawing together, how much more they are learning to appreciate the meaning of the words *Brotherhood* and *Fraternity*. Blessed are the helpers, for they also shall receive help! The Editor accidentally discovered lately a case in which an experienced teacher and enthusiastic reader of this column sent out thirty-one solutions privately and without charge to several other readers of THE JOURNAL, some of them more than 1,000 miles distant from the writer. Most likely there have been scores of other examples of brotherly kindness that will never be made public. All this is encouraging. It proves the existence and the rapid growth of a professional sentiment that is destined surely and speedily to elevate the whole body of teachers in their own estimation, and, consequently, in the general estimation of the outside public. It points to a time measurably nearer than ever before, when the professional spirit will dominate, when Public School teaching will be properly appreciated as one of the grandest works that can enlist the best energies of the best men and women in the nation, when millions of dollars will be more freely voted for elementary education than they now are for canals and railways, and when the occupation will no longer be degraded and dragged down by being made a convenient stepping-stone to so-called higher professions. Are these conclusions sound? Are the teachers going to elevate the work to its natural and proper level by devotion and by the proper application of means to the end? If any one thinks the omens are misleading, by all means let him say so through the columns of THE JOURNAL, and point out the firm grounds of his conclusions. Every teacher ought to do something for the general good, and one great good would be to expose fallacious hopes where they exist, and thus save us from disappointment. Agitation, discussion, debate, the presentation of the truth in all its aspects—this is the road upward rather than dumb indifference, silent stagnation, or timid submission to present conditions, whatever they happen to be. In the meantime, every teacher in the world who imitates the examples we have from time to time mentioned in this correspondence is really helping himself to a juster and nobler appreciation of the sublimity of his own daily work, and is in reality climbing to a higher ideal of the essential nobility of teaching as a life-work well worthy of the greatest talents and the loftiest ambition. Does any one despair of final triumph? If so, let him articulate his despair and the grounds of it through THE JOURNAL. Let us know the worst that can come, so that those who are hopelessly committed to Public School teaching for life may know what and how much to expect. We have arrived at a turning-point, as our predecessors did in 1858, and in 1871. If we do not speak out through the press and by the resolutions of the convention, we are simply drifting like bubbles on the immense stream of time, which will carry us all into eternity before the position of the Public School teacher has been appreciably altered for the better. To sit still in passive indifference, or to croak and grumble after the final decision has been made by the responsible authorities, is eminently unreasonable. The qualification for entrance to the teaching profession is now in the balance. Every teacher ought to study the proposed changes, and

Speak out his sincere convictions, so that they can be heard, and in such a way that the Education Department may be fully informed of the views of the army in the field who have to win the great battle of popular education.

SOLUTIONS.

No. 54. Solution I. By T.W. Let x be the number of lbs. of black tea, and (16-x) number lbs. green tea then 40x cents = value of black tea and { 775 - 40x } cents = value of the green tea

Solution II. By the EDITOR. x + y = 16; p1x + p2y = 775 p2x + p1y = 745 (p1 + p2)(x + y) = 1520

No. 55. By J.P. Let A and B be the two given points and CD the given straight line. It is required to find a point in CD such that the angles with A and B will be equal.

No. 70. Solution by the EDITOR. Given x^2 + y^2 = 10xy (A) x^2 + xy + y^2 = 11xy

Also given x^5 + y^5 = 178 sqrt(3) i.e., (x+y)[x^4 + x^2y^2 + y^4 = xy(x^2 + y^2)] = 178 sqrt(3)

No. 71. Solution by the EDITOR. The equations should have been printed x(x^2 + y^2) = y^3; y(x^2 + y^2) = x^3, whence

Substituting for y^2, a number of solutions result from the quadratics.

No. 73. Given xy(x-y) = a^3; yz(y-z) = b^3; zx(z-x) = c^3. Solution by the EDITOR. Add the three equations and factor, whence

Divide the equations by xy, yz, zx, respectively, and add

Substitute (10) in (1) and x^2 \* (R+b^3)/(R-c^3) \* (x-x \* (R+b^3)/(R-c^3)) = a^3

No. 74. Solution by the EDITOR. x^3 + y^3 + z^3 - 3xyz = 0 = (x+y+z)(x^2 + y^2 + z^2 - xy - yz - zx)

PROBLEMS FOR SOLUTION.

No. 81. Sent by J.V.M., Newboro, Ont. Factor (x-y)^4 + (y-z)^4 + (z-x)^4

No. 82. Solve x^3 + y^3 = 35; x^2 + y^2 = 13. Solution by the EDITOR. Square (1), cube (2), subtract and 2x^3y^3 - 39x^2y^2 + 972 = 0.

No. 83. A. has \$25,000 bank stock, which pays 8% dividend. When money is worth 7% he sells out and buys stock @ 205, that pays a dividend of 12%.

No. 84. sin. A + sin. 3A + sin. 5A cos. A + cos. 3A + cos. 5A = 1, find A.

Solution by W. PRENDERGAST, Inspector of Separate Schools, Ontario. 2 sin. 3A . cos. 2A + sin. 3A 2 cos. 3A . cos. 2A + cos. 3A = 1

sin. 3A = cos. 3A . 3A = 45 A = 15 (ii) 2 cos. 2A + 1 = 0

No. 85. A., B., and C. met. A. had 5 loaves, B. had 3 loaves, and C. had 40 cents. They divided the loaves fairly, and C. divided the money fairly between A. and B.

No. 86. A boy spent 2/3 of his money for a pair of skates, and had 57 cents more left than he spent. How much money had he at first?

No. 87. A merchant sells 60 pounds of tea and coffee for \$43.50, the tea at 90 cents and the coffee at 40 cents per pound. How many pounds of each did he sell?

No. 88. The radius of a circle is 26 inches, the perpendicular drawn from the centre on a chord 10 inches. Find the length of the chord.

No. 89. Given the hypotenuse of a right-angled triangle and the length of the two sides; construct the triangle.

No. 90. If money be worth 5%, what should be the price of 6% bonds which are to be paid off at par 3 years after the date of purchase, the interest on the bonds being payable half-yearly?

No. 91. A man invests a certain sum in 3% stock at 90, and an equal sum in 4% at 95. Each stock rises 5% in price; the investor then sells out and invests the proceeds of each stock in the other.

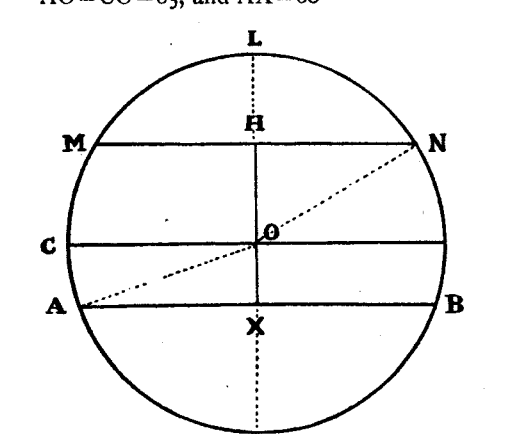
No. 92. 1/5 + 1/5^2 + 1/5^3 + 1/5^4 + 1/5^5 + 1/5^6 + 1/5^7 + 1/5^8 + 1/5^9

No. 93. 1/6 + 1/6^2 + 1/6^3, etc., etc., + 1/6^9

No. 94. 1/9 - 1/9^2 + 1/9^3 - 1/9^4 + 1/9^5 - 1/9^6 + 1/9^7

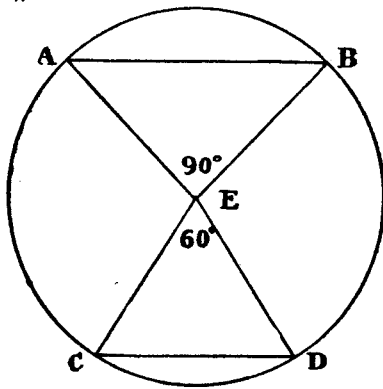
No. 95. Show that present value of a bond for \$1000 payable 10 years hence, and bearing interest at 4%, payable annually, money being worth 5%, is

40 { 1/1.05 + 1/1.05^2 + 1/1.05^3 + etc. + 1/1.05^10 } + 1000/1.05^10



Then OX = sqrt(65^2 - 60^2) = 25 OH = 64 - 25 = 39 Since ON = 65, being radius of the circle HN = sqrt(65^2 - 39^2) = 52 MN = 52 x 2 = 104 ft. Or OL = 65 and OH = 39. Then LH = 65 - 39 = 26 and MN = 2 sqrt(d-h)h = 2x sqrt((130-26)26) = 104 feet.

No. 47. Area of circle



$12 \times 12 \times 3\frac{1}{4} = 452.57142$  sq. ft.  
 Area of sector ABE is  
 $\frac{1}{4}$  of  $452.57142 = 113.14285$  sq. ft.  
 Area of sector ECD is  
 $\frac{1}{6}$  of  $452.57142 = 75.42157$  sq. ft.  
 Area of right-angle  $\triangle ABE$  is  $12 \times 12 = 72$  sq. ft.  
 Area of equilateral  $\triangle ECD$  is  $.433 \times 12^2 = 62.352$   
 $113.14285 - 72 = 41.14285$ ; and  $75.42157 - 62.352$   
 $= 13.06957$   
 and  $452.57142 - (41.14285 + 13.06957) = 398.35 +$   
 sq. ft.

## TEACHERS' SALARIES.

An old teacher once said to a young associate, "You are just beginning a life-long profession. Make up your mind now, never, without excellent reasons, to teach in a school for less than your immediate predecessor, and try to raise the salary during your stay if possible." Soon after, the young teacher, who didn't care very much whether she began her work that term or the next, was interviewed by the trustee of a country school, who was in something of a hurry to get a teacher, as the spring work was coming on and he wanted to get the children "out of the way." The following dialogue ensued:

"Now, I want a good school. There are forty-two children 'off and on,' more 'on' than 'off' when they've got a good teacher. Last teacher was a man. Expect to get a girl for less, of course. The highest class is algebra, and we don't want no children sent home at half-past three. We'll give you \$7. What do you say?"

"You paid the last teacher \$9, didn't you?"

"Well, yes, as I said before, he was a man, and we don't calculate to pay a woman as much, you know."

"You expect the same work done, don't you?"

"Why, yes, school's got to go all the time."

"And you expect it just as well done?"

"Why, of course, it wouldn't do to slack up any. Want algebra, and the law says there has got to be some physiology now."

"Well, I'll come for \$9."

"But we can't pay \$9 just for a girl! Annie Brown taught here last summer for just \$7," etc., etc.

They argued for awhile, and when the teacher was about to withdraw the trustee called her back and hired her for \$9, remarking that the money wasn't his now.

The next winter the former teacher returned, but found that the present teacher was going to remain. He also found that crayons had been substituted for rough pieces of chalk, and neat erasers for dirty, ragged cloths. He was also surprised to learn that there was a janitor. The next year that teacher got her salary increased to \$10; a year from then she received \$12, and the next term she didn't get a cent of salary. It was not with her "a life-long profession." The reason was that she got married. Just think of the years of professional usefulness that teacher lost by getting married! She married a Methodist minister. Her desertion was a calamity to the district. But it wasn't a calamity for that Methodist minister. The last heard of him he had built seven churches in seven successive charges, and was still at the business! It pays to be alive to the exigencies of the situation. If every teacher would try just one term to initiate a worthy precedent in some line of reform right in his own schoolroom, so that all who come after might see the "footprints in the sand" and more readily follow in the path of right-doing, what a vast, onward sweep the cause of education would receive!—*Educational News.*

## Primary Department.

## A SUGGESTION FOR CLOSING DAY.

BY RHODA LEE.

I like the old-fashioned plan, in vogue in our early schooldays, of ending the session's work in such subjects as writing, drawing, and language study, with a special test or exercise to show the progress made in the grade. When closing day arrived, the work which displayed the greatest amount of care was placed on exhibition, for the inspection of parents and friends who might visit the school. These so-called specimens, bearing name, date, and grade, were prized very highly by the children, as well as by the parents. It seems a mistake to make the closing exercise, as so often is the case, merely an entertainment. The element of work is enjoyed, and detracts nothing from the pleasure of the day, which, of course, should be a happy one for all.

In graded schools, especially, these specimens are of particular interest. Here the sessions are more clearly recognized by the children, owing to the great number of promotions which are always made at the end of each term. I have known children who kept, most carefully, specimens of their work such as I am speaking of, for a number of years, in order that they might clearly see what progress they had made. It certainly is an incentive to work to see that an advance has been made. In my own classes, as a specimen in writing, I used one of our favorite "gems" of poetry, such as the following:

## THE BEAUTIFUL.

Beautiful faces are those that wear—  
It matters little if dark or fair—  
Whole-souled honesty printed there.

Beautiful hands are those that do  
Work that is earnest, brave, and true,  
Moment by moment the long day through.

Beautiful lives are those that bless,—  
Silent rivers of happiness,  
Whose hidden fountains but few may guess.

Or—

Howe'er it be, it seems to me,  
'Tis only noble to be good;  
Kind hearts are more than coronets,  
And simple faith than Norman blood.

In drawing, I required a map, a design, or an attempted outline of some common object.

In language, the reproduction of a story—an original story—suggested by a picture, or a letter.

That the paper might be uniform, the children subscribed a few cents each to purchase material. The writing specimens were decorated with a small bow of ribbon at the upper left-hand corner, one color having been chosen by the boys, another by the girls. The ribbon was useful as well as ornamental, as by it the specimens could be suspended from a string stretched along the blackboard. It improved greatly the appearance of the room, as well as to the interest of the children.

One word I would add in regard to making selections for exhibition. By no means choose only the most skilfully executed work. Honest effort and earnest painstaking should be always rewarded. It is also well to direct the attention of the children in such matters as these to what are really the best exercises, what we and they should admire most. Moreover, I would never single out one child; rather would I say: We will pick out the six best, not the one best exercise.

It is a satisfaction (when, perchance, it is not a dissatisfaction) to the teacher to see how the children stand. Examinations are frequently disappointing, but in the end prove helpful, as by them, more clearly than in any other way, is the teacher shown wherein her teaching has been lacking. This should not discourage; we should rather be glad to see our faults, that, seeing, we may learn, and, learning, determine to do better, more effective, work in the session to come.

## STORIES FOR REPRODUCTION.

## THE HORSE AND THE OYSTERS.

A gentleman came into an inn on a very cold day, and could get no room near the fire, so he called to the hostler to get some oysters and give them to his horse. "Will your horse eat oysters?" asked the man. "Try him," said the gentlemen. At once all ran out to see this wonderful thing—a horse eating oysters—and the gentleman had his choice of seats. Soon the hostler returned with the oysters, saying that the horse would not eat them. "Then," said the visitor, "I must even eat them myself."

## THE SHOEBLACK'S DOG.

A British officer in Paris, happening to pass one of the bridges across the river which flows through that city, had his boots dirtied by a poodle dog rubbing against them; so he went to a man stationed on the bridge and had them cleaned. The same circumstance having happened thrice in the same place, his curiosity was awakened, and he watched the dog. He saw him roll himself in the mud of the river, and then watch for a person with well-polished boots, against which he contrived to rub himself.

Finding that the shoeblick was the dog's owner, he taxed him with the artifice, and after a little conversation the man owned that he had taught the dog the trick in order to procure customers for himself. The Englishman, much pleased with the dog's sharpness, bought him at a high price, and took him to England. For a while he kept him tied up in London, and then he unloosed him. The dog stayed with him a day or two, and then made his escape. A fortnight afterwards he was found again in Paris playing his old tricks on the bridge as before.

After a teacher has been trained to look for and discover a principle underlying every device she employs, there is absolutely no danger in suggesting devices to her.—*Dr. Balliet.*

Hints and Helps.

SINGLE TO DOUBLE ENTRY.

For the benefit of those who have read the paper on "The Fundamental Principles of Double Entry Bookkeeping," by J. W. Johnson, F.C.A., Principal of the Ontario Business College at Belleville, published in the last issue of THE EDUCATIONAL JOURNAL, Mr. Johnson has kindly furnished, as a supplement, an illustration of one of the subjects dealt with, namely, the conversion of the single entry ledger, alluded to in the paper, to double entry. The ledger has been made as simple as possible, so that the principle involved may be easily understood. The inventory of merchandise given in the statement in last issue should have been printed \$9,000, instead of \$10,000.

THE LEDGER AS IT WAS IN SINGLE ENTRY.

Dr.	John Jones, Capital Account.	Cr.
To Withdrawals	\$ 700 00	By Investment .. \$4000 00
Robert Brown, Capital Account.		
To Withdrawals	\$ 600 00	By Investment .. \$4000 00
W. C. McCrea.		
	\$ 200 00	
Joseph Bryce.		
	\$ 160 00	\$ 20 00
H. Lazier.		
		\$ 170 00
G. McCullough.		
	\$ 375 00	
H. J. Attridge.		
	\$ 10 00	\$ 69 00
R. Jackson.		
	\$ 35 00	
W. H. White.		
	\$ 100 00	\$ 260 00
Thomas Vincent.		
		\$ 23 00
L. F. Purdy.		
	\$ 50 00	\$ 20 00
K. Fitzgerald.		
	\$ 201 00	\$ 50 00
J. B. Lamb.		
	\$ 301 00	\$ 200 00
Albert Strong.		
	\$ 190 00	
W. Fleming.		
	\$ 53 00	\$ 361 00
F. J. Forbes.		
	\$ 260 00	

THE SAME LEDGER CONVERTED TO DOUBLE ENTRY.

Dr.	John Jones (Capital Account).	Cr.	
To Withdrawals	\$ 700 00	By Investment	\$4000 00
" Balance.....	4920 00	" Gain.....	1620 00
	\$5620 00		\$5620 00
		By Balance	
		(Present worth)	\$4920 00

Dr.	Robert Brown (Capital Account).	Cr.	
To Withdrawals	\$ 600 00	By Investment	\$4000 00
" Balance.....	5020 00	" Gain.....	1620 00
	\$5620 00		\$5620 00
		By Balance	
		(Present worth)	\$5020 00
W. C. McCrea.			
	\$ 200 00		
Joseph Bryce.			
	\$ 160 00	By Balance..	\$ 20 00
	160 00		\$ 140 00
To Balance...	\$ 140 00		\$ 160 00
H. Lazier.			
			\$ 170 00
G. McCullough.			
	\$ 375 00		
H. J. Attridge.			
To Balance.	\$ 10 00		\$ 69 00
	59 00		
	\$ 69 00	By Balance..	\$ 69 00
			\$ 59 00
R. Jackson.			
	\$ 53 00		
W. H. White.			
To Balance..	\$ 100 00		\$ 260 00
	160 00		
	\$ 260 00	By Balance..	\$ 260 00
			\$ 160 00
Thomas Vincent.			
			23 00
L. E. Purdy.			
	\$ 50 00	By Balance..	\$ 20 00
			30 00
	\$ 50 00		\$ 50 00
To Balance...	\$ 30 00		
K. Fitzgerald.			
	\$ 201 00	By Balance..	\$ 50 00
	201 00		151 00
To Balance...	\$ 151 00		\$ 201 00
J. B. Lamb.			
	\$ 301 00	By Balance..	\$ 200 00
	301 00		101 00
To Balance...	\$ 101 00		\$ 301 00
Albert Strong.			
	\$ 190 00		
W. Fleming.			
To Balance...	\$ 53 00		\$ 361 00
	308 00		
	\$ 361 00	By Balance..	361 00
			\$ 308 00
F. J. Forbes.			
	\$ 260 00		
Merchandise.			
To am't as per			
Inventory ...	\$850 00		
Bills Receivable.			
To amount of			
notes on			
hand.....	\$700 00		
Office and Store Furniture.			
To am't as per			
Inventory ...	\$30 00		
Cash.			
To amount on			
hand.....	\$260 00		
Bills Payable.			
		By amount of	
		notes out-	
		standing....	\$1600 00

THE PERFECT HEADMISTRESS.

A BACONIAN CHARACTER.

She hath the gift of sympathy, which the Grecians call a fellow-feeling. She remembereth the name and condition of every person about her, and she showeth an interest in them all. She comprehendeth all natures; she hath no contempt for any. Therefore all are attracted to her, and place their trust in her.

She is, like the divine Providence, slow to anger. She considereth that she also is mortal, and therefore liable to error; but her subordinates doubt it.

She hath very pretty manners. Being in a figure royal, she is royally gracious. For she forgetteth herself in the desire to set at ease them that come to her.

To live near her is an inspiration. For there is none that would show any but his best work in her presence, since she herself giveth always of her best.

She is not equally well skilled in all subjects, having had no more than the common span of time in which to perfect the gifts of her intellect. Yet she knoweth the difficulties of all her underlings; her counsel is wise; she is quick to discern between the ways that are good and them that be indifferent or naughty.

To all she is easy of approach, and most easy to the perplexed in spirit. She hath an unending patience, and so great a compassion for dullness, though it be far removed from the nimbleness of her own mind, that even the dullest do not fear to speak of their troubles to her. She is as a Mother Confessor to every anxious soul. From that chamber which she calleth her confessional the sad go away comforted, the ignorant wiser, the slothful inspired, the rebellious disciplined.

She remembereth that the feminine body is made chiefly, though not altogether, of flesh and blood, which are but frail materials; she hath considered, with a sigh, that flesh at its best is but weak; and she asketh of human nature no more than it is able to perform.

She is a born administratrix. She marshalleth her forces even as a skilful general; she perceiveth the several capacities of her captains. She discovereth to each that talent which lay hid, as it were, in a napkin, and showeth him its proper use. But, while she exalteth the humble and enableth him to do that good work which he would have left undone, she also putteth down from his seat too towering self-esteem; and this also she achieveth with that gentleness which causeth the ones, though abashed, to give to her even more gratitude than the others.

She is of them that know well to rule, for that they have in their own youth practised to obey. They then that follow her do this of love more than of duty: they know no weariness in her service, nor are any of her commands hard to them.

She loveth little children. She knoweth men, manners, and cities; she hath a wide and various experience, and this she putteth to an excellent use. She esteemeth that which is trivial at its right value; and concerneth herself not overmuch about the unimportant; yet will she astonish the unthinking when she showeth that from a matter, seeming to them but small, there depend great issues.

Yet is she cheerful of spirit. Therefore they that be about her will also be cheerful. And that which is done is done with spirit, and the burden of learning groweth light to bear. The sound of laughter is about her chambers; in them is acquired that good gift of courage; they that learn of her go forth ready to encounter the sorrows of this life.

She looketh forward into the future, and perceiveth that the young maidens about her will in a brief space be women. Therefore she holdeth not altogether by fluxions and the *oratio obliqua*, nor even by the paintings of Botticelli and the works of Ulrici and Gervinus. She will have her maidens to be honest, of good report, as truthful as their own glasses, of a perfect courtesy and modesty, a constant thoughtfulness for all the weak and distressed, and a saving common sense. These virtues she alloweth in season and out of season, and yet more by example than precept; for she hath gone by the advice of a wise poet, and "in her own heart let them first keep school."

With all this she hath a singular humility. Though there be in her a clearer insight and a

riper knowledge than in any that come to her, nevertheless she speaketh as one who knoweth that she is yet at the beginning of knowledge, and herself seeketh counsel of all, for she perceiveth there is none but can tell us that of which we are still ignorant, and which it would profit us to know.

In the years to come her children will rise up and call her blessed, and their husbands and children with them.—*Ignotus, in London Journal of Education.*

## For Friday Afternoon.

### PUSSY WILLOW.

The brook is brimmed with melting snow,  
The maple sap is running,  
And, on the highest elm, a crow  
His coal-black wings is sunning.  
A close green bud the Mayflower lies,  
Upon its mossy pillow;  
And sweet and low the South wind blows,  
And through the brown field calling goes,  
"Come, Pussy! Pussy Willow!  
Within your close brown wrapper stir,  
Come out and show your silver fur!  
Come, Pussy! Pussy Willow!"

Soon red will bud the maple trees,  
The blue birds will be singing,  
And yellow tassels in the breeze  
Be from the poplars swinging,  
And rosy will the Mayflower be,  
Upon its mossy pillow.  
But you must come the first of all,—  
"Come, Pussy!" is the South wind's call,  
"Come, Pussy! Pussy Willow!"  
A fairy gift to children dear,  
The downy firstling of the year,  
"Come, Pussy! Pussy Willow!"

### A RAIN SONG.

Tinkle, tinkle,  
Lightly fall  
On the peach-buds, pink and small;  
Tip the tiny grass and twinkle  
On the willows, green and tall.

Tinkle, tinkle—  
Faster now,  
Little raindrops, smite and sprinkle  
Cherry bloom and apple bough!  
Pelt the elms and show them how  
You can dash!  
And splash! splash! splash!  
While the thunder rolls and mutters, and the light-  
nings flash and flash!  
Then eddy into curls  
Of a million misty swirls,  
And thread the air with silver, and embroider it  
with pearls!

And patter, patter, patter  
On the mossy flags, and clatter  
On the streaming window-pane.  
Rain, rain,  
On the leaves  
And the eaves,  
And the turning weathervane!

Rush in torrents from the tip  
Of the gable-peak, and drip  
In the garden-bed, and fill  
All the cuckoo cups, and pour  
More and more  
In the tulip-bowls and still  
Overspill  
In a crystal tide, until  
Every yellow daffodil  
Is flooded to its golden rim, and brimming o'er  
and o'er.

Then as gently as the low  
Muffled whir of robin wings,  
Or a sweep of silver strings,  
Even so  
Take your airy April flight  
Through the merry April light,  
And melt into a mist of rainy music as you go.  
—*St. Nicholas.*

## School-Room Methods

### DIDN'T UNDERSTAND IT.

"If you sell a house for \$5,000 and lose 12½ per cent., for what price should you sell another, at an advance of 12½ per cent. so as to cover the loss on the former house?"

The foregoing problem is in the Complete Arithmetic of the Indiana Series. A pupil tried to get it "but couldn't understand it." She appealed to the teacher for help. What should the teacher do? Should he tell the pupil to study it out for herself, or should he give some assistance? All will admit that the teacher should not do the problem for the pupil, because he would not be doing the best thing to develop the pupil's powers. If it is done for her she will be very little, if any, more able to solve the next difficulty that may present itself.

This teacher did something like the following:  
T.: What is the \$5,000? P.: It is what the house was sold for. T.: How does it compare with the cost of the house? P.: It is less than the cost. It is 12½ per cent. or ¼ less than the cost. T.: Yes; how do you know it is? P.: Because it is stated in the problem that he sold it at a loss of 12½ per cent. T.: Very well. Now what part of the cost is the \$5,000? P.: It is ¾ of the cost. T.: What, then, is ¼ of the cost? P.: ¼ of \$5,000 or \$714½. T.: How much must he gain on the other house? P.: I don't know. T.: Read the problem. (Pupil reads.) T.: What does it mean by "covering" the loss of the former house? P.: I don't know. T.: It means that he sells the other house so as to gain as much as he lost on the former house. P.: Oh.

We think the teacher did right in telling what this language means. There was no way that the pupil could find out for herself. It is a peculiar use of the word "cover" that she was not acquainted with. This is what made her say "Oh" when the teacher told her what it meant. How much we put into exclamations! The pupil must have thought, "Oh, if that is what it means, I can tell how much he must gain by his second sale." Without any further question or suggestion from the teacher she said, "He must sell it so as to gain \$714½." T.: Yes; what per cent. does he gain on the second house? P.: I don't know. T.: Read. Pupil reads and again said, "Oh," and then added, "Why, 12½ per cent." T.: Then what part of the cost does he gain? P.: ¼ of it. T.: For how many eighths of the cost does he sell it? P.: He must sell it for nine-eighths of the cost, for he sells it to gain one-eighth. T.: Then \$714½ is what part of the selling price of the second house? P.: One-ninth of it; so he must have sold it for 9 × \$714½, which is \$6,426½.

How much shorter it would have been for the teacher to have said: "Divide \$5,000 by 7, and multiply the result by 9." Or, "He must have sold it for ¾ of \$5,000!" This would be the best thing to do if the answer were the end for which the teacher is working. But since it is the development of the pupil's powers that is the end in view, the last plan is almost worthless and the first one of great value.

### \* POOR DOROTHY TRUE.

Poor little, bored little Dorothy True!  
A sad little maiden with nothing to do.  
There's a room to be dusted, a bed to be made,  
And the eggs to be found which the bantam has laid.

There's a wee little boy in the nursery near,  
Who's sobbing and crying with no one to hear,  
But poor little, bored little Dorothy True  
Still sits and laments that she's nothing to do!

—*Margaret Seymour Hall, in St. Nicholas.*

Scene, a country schoolroom, and a class of bright children, to whom the teacher is giving a language lesson, with the intention of mixing in a little temperance. The subject is "Corn." We have progressed nicely from the time when the kernel is placed in the ground until the corn is gathered, husked, and ready to be used. Various articles of food are mentioned. "And now, can any one tell me something that is made from corn that is not good for us?" Wildly waving hand. "Well, Johnny?" "Mush!" he cries, with emphasis.

## Correspondence.

### SOME PRACTICAL SUGGESTIONS.

To the Editor of THE EDUCATIONAL JOURNAL:

SIR,—I am glad to see, by the discussions in your paper, that the teachers of Canada—or Ontario, at least—are awakening to the necessity of concerted action, if they do not wish to be forced to the "minimum of subsistence line." In addressing you I have no desire to arouse the antagonism of my fellow-teachers. I, therefore, leave with others the questions of standards, age of entering the profession, and duration of training schools. I propose to offer a few suggestions for reform on another tack, and hope to see a friendly discussion thereon in your columns.

First of all, we are too much governed in school matters, as in all else. Every school (rural) has its separate trustee board. These trustees, from lack of choice and other reasons, are usually not the best officers possible, and are often ignorant men, many of them just able to sign their names. Such men, as all are aware, are easily influenced by local prejudices, sectarianism, etc. With such trustees, it can readily be conceived that pecuniary advantages to the section will outweigh intellectual ones. The teacher who will take the least salary is usually the fortunate (?) appointee.

Consider, too, the outlay for secretaries' salaries, annual elections, and frequent advertisements for teachers.

While no invention of man is perfect, I think all the above objectionable features may be partially remedied by the following, or a similar, scheme:

Let a county be divided into districts, having regard to convenience in size, population, number of schools, or some such guide. Then, for election purposes, each district may be subdivided into wards or townships. Let one or two trustees be elected to represent each subdivision for a term of years, as at present. One secretary would then be sufficient for each district, the number of trustees would be materially reduced, together with cost of appointment, salaries of secretaries, and other expenses. The trustees would have the appointment of teachers for all the schools of their district. The wider area would give better choice of men to fill the position of trustee, and would minimize the influence of local prejudice in appointment of teachers.

Again, as the engagement of a teacher under the present régime expired, it would be the duty of the trustees to advertise, without prejudice to the present teacher's chance of re-engagement, if qualifications were satisfactory. This advertisement should state average attendance at school, and, perhaps, salary offered. This would be more satisfactory to teachers, and would do away with a great deal of extra labor in reading and replying to useless applications.

The choice having been made, the appointee should be engaged, not for a year, as at present, but for a term of years—say, three, or four, or five—with the promise of an increase in salary annually. This would minimize the system of underbidding, at present such a bane to good teachers. It would also give stability to the profession by making it worth while for a teacher to retain his place, and encourage good teachers to remain in the profession. Other advantages will occur to your readers.

When we consider that for the eight thousand Public School teachers in Ontario in 1893 the average salary was less than \$225, it is time we sought, by united effort, to improve our condition and prove that the laborer is worthy of his hire. Surely, with greater difficulty of access to the profession and a reconstruction of the system of choosing trustees and teachers, we should soon see a vast improvement in salaries and better qualified teachers.

Above all, teachers who are expected to instil into the minds of the young principles of honor and morality should cultivate the *esprit de corps* so essential to the welfare of a community, and should avoid underbidding and all violation of professional etiquette.

E.E.L.

Richmond Hill, May 31, 1895.

## Question Drawer.

All questions for this department, like all communications for any other department of THE JOURNAL, must be authenticated with the name and address of the writer, and must be written on one side of the paper only. Questions should also be classified according to the subject, i.e., questions for the English, the Mathematical, the Scientific, and the general information departments should be written on separate slips, so that each set may be forwarded to the Editor of the particular department. If you wish prompt answers to questions, please observe these rules.

**NORWICH.**—We cannot, at present, obtain authoritative information to enable us to answer your question.

**C.S.**—Copies of the time-tables can, no doubt, be seen on application to any Public School principal. They would occupy too much of our space.

**R.A.H.**—There will be no paper on Agriculture, unless, perhaps, on special request. It is at present optional. A fee of one dollar may be charged by the County Council in the case of county pupils, or by the High School Board in the case of other candidates.

**L.A.F.**—(1) This belongs to the English department, to which it has been referred, but answer cannot be given in this number. (2 and 3) We have repeatedly been asked questions about "Main slant," "Connective slant," principles, etc., in writing, which we cannot answer. We are not aware that any such principles exist, or, which is the same thing, have been agreed on. Many teachers prefer the vertical system, and, we believe, use it. As the Education Department prescribes no particular system or text-book in writing, it would seem that no such questions should be set by examiners.

## Literary Notes.

"Some Thoughts on Canada" is the title of an interesting article by the Marquis of Lorne in the June number of the *North American Review*.

"England, Venezuela, and the Monroe Doctrine," is trenchantly discussed in the June number of the *North American Review* by Senator Henry Cabot Lodge, of Massachusetts, who maintains that the Monroe doctrine should be established at once, in order to put an end to Great Britain's territorial aggressions in South America.

Herbert Spencer has a second article of his series on Professional Institutions in *The Popular Science Monthly* for June, in which he will trace the evolution of the professions of the physician and surgeon. These professions, which have been now united and again separate, have a common origin in the function of the primitive medicine man, who is generally identical with the primitive priest.

Under the title, "William Shakespeare: His Mark," William Cecil Elam, in the June *Lippincott*, shows how largely the speech of illiterate Virginians is that of the corresponding class in England near three centuries ago, as preserved by the great dramatist. In "The Tyranny of the Pictorial," Sidney Fairfield exposes one of the most prominent fads of the day. He complains that pictures, especially of women, occupy too largely the place of reading matter; and all who are familiar with our illustrated papers and magazines—as who is not?—must admit that he hits the mark.

It will interest our readers to learn that Dr. A. S. Johnson, editor of *Current History*, the well-known quarterly review published at Buffalo, N.Y., is a Canadian by birth, a graduate of the University of

Toronto. After serving as Fellow in University College under the late Prof. Young, and as Instructor in Cornell University, Ithaca, N.Y., under Prof. (now President) Schurman, he became identified with the starting of the unique and valuable magazine, which, under his editorial management, has come to be recognized in all parts of the world by scholars and public men as a valuable work of reference on all questions of present or recent interest.

The Editor of the *Review of Reviews*, in his running comment on "The Progress of the World" in the June number, reviews the Cuban situation and England's Nicaraguan relations at some length; he also summarizes the probable results of peace in the far East. Other international matters which receive attention in the editorial pages of the *Review* are the relief of Chitral, German and Austrian politics, France and the Nile, the new Speaker of the British House of Commons, elections in Greece and Denmark, the Pope's Encyclical to England, and the school question in Manitoba. On the side of home politics, considerable space is devoted to the silver controversy, the annulment of the income tax, and the prospects of civil service reform.

"Children's Sunday," is the subject of H. P. Barnes' beautiful frontispiece to the June *Babyland*—a farmhouse landscape with two pretty little girls and their grandmother starting away to church. "The Kind Little Cat," is the opening story with four pictures. A charming poem by Everard Jack Appleton, "Do You S'pose?" has a picture of the "Small Boy," who seems stunned by the catalogue of his little sins against his parents. The Marching Play is "The Wild Hare," and to wear the long "bunnycars" will delight the little ones of the nursery and kindergarten. In Mrs. Pratt's serial, "The House of the Grandmothers," the little blue-eyed heroine is evidently contemplating an adventure all by herself. The "Nimble Pennies" turn into a plump Poll Parrot. 50 cents a year, 5 cents a number. Specimen (back number) free. Alpha Publishing Company, Boston.

In the June number of *Little Men and Women*, Mrs. Cora Stuart Wheeler has an account of the way the Boston children study plant-life in their school-gardens, and gives two of their written plant descriptions: a little primary boy's observations of the pussy-willow, and those of a

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seventh-grade pupil on a Balm of Gilead twig during the month of March, accompanied by his drawings; there is also a picture of a class at work in the "garden" of the George Putnam School. A good story by Everard Jack Appleton is entitled "The Boy from the Circus." In Sophie Swett's serial, "Polly and the Other Girl," the two young heroines get possession of a circus pony. In the "American Dog Abroad," serial, Tony meets with a gipsy's dog. In Mr. Thomson's "Great Cats" series, the leopard story is entitled "How Mbengo Earned his Knife." The Doll Dressmaking lesson is on doll gowns with guimpes. Miss Emilie Poulsen contributes "The Ballad of a Bumptious Boy," with four pictures by Frank C. Drake. "Peterkin" rehearses his part as a Firefly for the coming "Poetry Party." \$1.00 a year, 10 cents a number. Specimen (back number) free. Alpha Publishing Company, Boston.

## Book Notices.

**HOMEMADE APPARATUS.** By John F. Woodhull. Kellogg & Co., New York and Chicago, 45c.

Teachers very often say that they would like to teach physics and chemistry experimentally, but they have no apparatus. Mr. Woodhull has made an excellent beginning in trying to solve this real difficulty. The book is full of valuable suggestions, is well illustrated, and should find a place in the equipment of every science teacher.

**GUIDES FOR SCIENCE TEACHING, NO. XVI. First Lessons in Chemistry.** By G. P. Phoenix. Price 20c. D. C. Heath & Co., Boston.

Every public school teacher who wishes to make his pupils do a little real thinking about the common objects around them should have a copy of this little guide. The apparatus will cost less than \$2, with which over forty experiments may be carried out.

**FIRST LESSONS IN ELECTRICITY AND MAGNETISM.** By Maycock. Whitaker & Co., London. Price 2s. 6d.

This book is intended as an introduction to such works as the elementary text-book by Silvanus Thompson. Mr. Maycock treats of the subject in a clear and comprehensive manner, so that the dullest student must understand. The experiments selected are clearly stated and logically arranged.

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## NOTICE.

TEACHERS will please note that the edition of "Notes on Entrance Literature," edited by F. H. Sykes, M.A., and published by the Canada Publishing Company, is now exhausted, and, as no further edition is to be published, we can no longer fill any orders for this book.

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## OFFICIAL CALENDAR

OF THE

# Educational Department.

June:

1. Public and Separate School Boards to appoint representatives on the High School Entrance Examination Board of Examiners. [H.S.Act, sec. 38 (2).] (On or before 1st June.)
11. University Commencement. (Subject to appointment.)
28. High Schools close, third term. [H.S.Act, sec. 42.] (End on 30th June.)  
Public and Separate Schools close. [P.S.Act, sec. 173 (1) (2).] (End 30th June.) S.S.Act, 79 (1) (2).] (End 1st July.)
29. Semi-Annual Reports of High Schools to Department, due. [H.S.Act, sec. 14 (12).] (Close of half year.)  
Rural Public School Trustees to report average attendance of pupils to Inspector. [P.S.Act, sec. 206.] (On or before 30th June.)  
Protestant Separate Schools to transmit to County Inspectors names and attendance during the last preceding six months. [S.S.Act, sec. 12.] (On or before 30th June.)  
Semi-Annual Reports of Separate Schools to Department, due. [S.S.Act, sec. 28 (18); sec. 62.] (On or before 30th June.)  
Trustees' Report to Truant Officer, due. [Truancy Act, sec. 12.] (Last week in June.)  
Assessors to settle basis of taxation in Union School Sections. [P.S.Act, sec. 95 (1).] (Before 1st July.)

## ANNUAL EXAMINATIONS, 1895.

### NOTICES.

June 1.—Notice by candidates for Kindergarten examinations to Department, due.

### EXAMINATIONS.

- June 4.—Practical Examinations at Normal School begin.
- June 12.—Written Examinations at Normal Schools begin.
- June 26.—Examinations in Oral Reading, Drawing, and the Commercial Course in High, Public, and Separate Schools begin.
- June 27.—High School Entrance and Public School Leaving Examinations begin.  
Kindergarten Examinations begin.
- July 2.—High School Junior Leaving, University Pass, Matriculation, and Scholarship Examinations begin.  
Commercial Specialists' Examination at Toronto begin.
- July 4.—High School Primary Examinations begin.
- July 11.—High School Senior Leaving and University Honor Matriculations Examinations begin.