To show that this method leads to the correct solution in any case, we may consider £$(\frac{3}{5} \div \frac{3}{10})$.

By our plan this is the same as £$(\frac{3}{5} \times \frac{10}{3})$ = £$\frac{30}{15}$ = £2.

But £$(\frac{3}{5} \div \frac{3}{10})$ represents the cost of 1 ton if $\frac{3}{10}$ ton cost £$\frac{3}{5}$. The answer to this can be found by considering that if 6 cwts. cost 12/-, 1 ton costs £2.

The principle advocated here is to find first of all what the answer should be, and then to see how the fractions are to be manipulated to arrive at that answer.

G. PHILIP.

A First Lesson in Algebra.—A big stumbling-block in the way of the child beginning Algebra is the transition from the conception of definite numbers in Arithmetic to that of indefinite quantities in Algebra, and the performance on these of the fundamental operations with facility and certainty. It is a truism that our algebraic teaching must grow out of our arithmetical: in its initial stages it may with advantage be based on some such method as the following. From a box of counters, or little wooden cubes, or in fact any handy articles, ask several pupils—better still, all the pupils, if the class be of convenient size—to pick out respectively five counters, eight counters, and so on. Their possessions can be exhibited on the black-board thus:—"A has *five* counters," "B has *eight* counters," etc. The counters being replaced, now ask others to take out *some* counters each. So long as the boys hold these in their closed hands no one can tell what quantity of counters any boy has; all that can be said is that each boy has *some* counters. Hence on the black-board is written:—"L has *some* counters," "M has *some* counters," and so on for each boy. Now the pupils have been accustomed in their arithmetical work to use various shorthand symbols in order to avoid writing out in full frequently occurring words or phrases. Thus, instead of the word "one" we use 1; the expression "multiplied by" is represented by ×, and so on. We therefore rub out the words "five" and "eight" that we wrote at first. and write in place of them their symbols "5" and "8."

Similarly, to avoid writing continually the word "some" we shall, say, delete "ome" and simply write "*s* counters," with the understanding, for the time being at least, that *s* stands for the indefinite adjective *some.* The number of counters that each boy has is now determined, and it is found that one has nine, another fourteen, another twenty-two, as the case may be, whence it is seen that "*s* counters" (*i.e.*, of course, "*some* counters") stands for varying quantities of counters.

It is desirable at this stage not to represent every unknown quantity by x, but to accustom the children to speak of p pence, m miles, etc. Simple exercises such as these will now follow:—"How many pence in 5 shillings? 60—got by mutiplying 5 by 12. Therefore, how many pence in s shillings?" "How far does a man go in 3 hours, walking at the rate of 4 miles per hour? 12 miles—got by multiplying 3 by 4. Therefore, how far does he go when he walks at the rate of m miles per hour?" Naturally such exercises would be followed immediately by simple problems leading to linear equations in one variable.

By such a method it may probably be found that the children obtain a better idea of a letter representing an indefinite quantity, than if they had been taught to regard "Let x equal ——" as the Open Sesame! to every algebraical problem.

ARCHD. MILNE.

Evaluation of Trigonometrical Ratios of Angles which are not Acute.—The following is meant as a set of working rules for applying the definitions of the trigonometrical ratios of *any* angle, where numerical evaluation is required. Let the initial arm of the angle be horizontal.

Suppose we have to find cos250°.

(*a*) What acute angle does the radius vector of 250° make with the horizontal? 70°: set it down as in equation (1).

(*b*) What ratio are we given? The cosine: set it down as in equation (1).

(*c*) In what quadrant does the radius vector of 250° lie? The third: write a small 3 over 250° in equation (1).