

TEACHING

A QUARTERLY TECHNICAL JOURNAL FOR TEACHERS

VOL. IV.

MARCH 1932

No. 3.



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TEACHING

A QUARTERLY TECHNICAL JOURNAL FOR TEACHERS

Editor : - - H. R. HAMLEY

VOL. IV

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EDITORIAL

WE are glad to be able to announce that Mr. H. Champion, Principal of the Training College at Saidapet, Madras, has accepted the honorary editorship of *TEACHING* in succession to Mr. H. R. Hamley.

Mr. Hamley has now left India. After taking exceptionally high honours in special research work in America, he has joined Sir Percy Nunn's staff at the London Day Training College. His interest in the *JOURNAL*, he assures us, will remain as keen as ever, and we confidently await the fulfilment of his promise to give us some more of those closely-argued but lucidly presented and practical articles which we have come to expect from his pen. Mr. Hamley's has been an almost uniquely international educational experience; and he still moves on.

Nevertheless, though an actual 'goodbye' we trust it may not prove, it is our duty now formally to bid our old editor farewell, and we send our grateful good wishes to the careful nurse of our first tender years.

Mr. Champion, who will take over the editorial work from the beginning of Volume V, needs little introduction to the teaching world of India. To our south Indian readers his name will at once suggest both enthusiasm and ability in things worth while educationally. He has, perhaps more particularly of recent years, interested himself in the activities and future development of rural schools; and we think that to the teachers of such schools this *JOURNAL*, aiming as it does to 'provide a constant stimulus to the keen and enterprising teacher to keep his methods up-to-date', must always have made and will now continue to make, under Mr. Champion's auspices, a peculiar appeal. The new editor of *TEACHING* is already considering various new ways to interest and benefit both our rural and urban readers, and it becomes our confident hope that the *JOURNAL*, whose success so far has been surely, if slowly, established with the enthusiastic few, may now go forward into spheres of yet wider utility.

THE TEACHING OF SIMPLE FRACTIONS

A FRACTION of anything is a part of that thing.

A fraction of a number is a part of that number, such as a half or a quarter.

If we divide anything into several equal parts, each of these parts is a fraction of the thing.

If we divide a number into several equal parts, each of these parts is a fraction of the whole number.

We can take each of these parts and use it separately, or we can take some of them together, or we can take the whole number.

Suppose we take an orange and divide it into segments and find that it has 12 segments.

We can then take 6 of these segments and we will have half of the orange.

Of the 12 segments we will have 6, or in other words we will have 6 of the 12 fractions of the orange.

In arithmetic the usual way to show that we have taken 1 fraction of the 12 fractions of the orange is like this, $\frac{1}{12}$.

This means that the whole orange was divided into 12 segments, and that we have taken 1 of them.

We write the total number of parts into which the orange was divided below the line, and the number of parts that we have taken above the line.

If we took 3 segments we would write it as $\frac{3}{12}$.

Note.—The teacher should here ask the boys to show how to write 4 segments or 5 segments, etc.

He should then say: 'If there were 16 segments in the orange, how would you show that you had taken 1, 2, or 3 segments?' etc., etc.

Suppose we take 1 anna and divide it into 12 equal parts, what will each part be called? Each will be called 1 pie. We can write 1 pie, $\frac{\text{pie}}{1}$ or $\frac{1}{12}$ anna.

Make sure that the boys can explain this.

Explain that $\frac{1}{12}$ anna means in full $\frac{1 \text{ pie}}{12 \text{ pies}}$ just as $\frac{1}{12}$ orange means $\frac{1 \text{ segment}}{12 \text{ segments}}$.

12 pies make 1 anna, and the 12 segments made 1 orange.

We could have written it as 1 pie or 1 segment, but it is sometimes more convenient to write $\frac{1}{12}$ anna or $\frac{1}{12}$ orange.

In the same way we write $\frac{1}{4}$ rupee or $\frac{1}{2}$ seer instead of writing one quarter of a rupee or one half of a seer.

Now take a square and divide it into 3 equal parts thus :

Each part will be written in arithmetic as $\frac{1}{3}$, as each will be one third of the whole square.

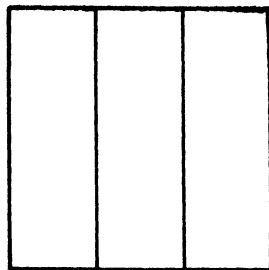


Fig. I

Now suppose we take 2 parts, we will have two-thirds of the whole square. It is clear that if we wrote $\frac{1}{3}$ when we took 1 part, we must write $\frac{2}{3}$ when we take 2 parts.

Now if we take all 3 parts we must write in the same way $\frac{3}{3}$. But if we take all 3 parts we are taking the whole square.

So we find that $\frac{3}{3}$ square is the same thing as 1 square and that $\frac{3}{3}$ orange is the same thing as 1 orange; or, as we write in arithmetic,

$$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{3}{3} = 1.$$

Thus, to add together fractions with the same denominator, or in other words, to add any number of equal parts of the same thing, *we only add the numerators, or in other words we count up how many such parts these are.*

Note.—Make sure here that the boys understand that *the denominator is only the name of the thing with which we are dealing.*

The fractions $\frac{1}{2}$, $\frac{3}{4}$ are only written in that form for convenience. They might, otherwise, be written one-half, three-quarters.

If the boys understand so much thoroughly, they will have no trouble in understanding addition or subtraction.

Take the square divided into 3 equal parts (Fig. I).

Ask the boys how many parts there are. 'Three.' 'If I take one away how many will be left?' 'Two.'

We have already found that in arithmetic we show the whole square when divided into 3 equal parts as $\frac{3}{3}$. Then if we take away 1 part, and only 2 are left, they will be written as $\frac{2}{3}$.

Now give some more simple examples, such as

$$\frac{5}{9} + \frac{4}{9}; \quad \frac{7}{11} + \frac{4}{11}; \quad \frac{5}{6} + \frac{1}{6}; \quad \frac{9}{9} - \frac{6}{9}; \quad \frac{12}{12} - \frac{5}{12}; \quad \frac{7}{7} - \frac{3}{7}.$$

Do not attempt any further progress till the boys are quite clear in regard to addition and subtraction of fractions with the same denominator.

Test them with three or four fractions, such as

$$\frac{2}{7} + \frac{3}{7} + \frac{2}{7}; \quad \frac{4}{9} + \frac{1}{9} + \frac{3}{9}; \quad \frac{5}{12} + \frac{4}{12} - \frac{7}{12}; \quad \frac{6}{10} - \frac{2}{10} + \frac{6}{10}; \quad \frac{6}{12} - \frac{6}{12} + \frac{8}{12}.$$

Such sums should be done mentally, and on no account should they be written with a common denominator in this form $\frac{6-6+8}{12}$.

The boys should be taught to see that as the three fractions have the same denominator the process of addition and subtraction is only concerned with the numerators.

We must next deal with denominators of different values.

Take the square again.

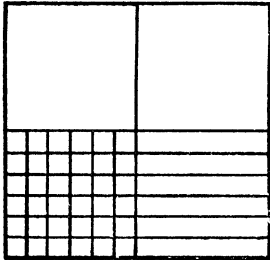


FIG. II

Divide in half by a vertical line and again in half by a horizontal line.

The horizontally shaded portion is one-half, or $\frac{1}{2}$, of the square.

The vertically shaded portion is one-quarter, or $\frac{1}{4}$, of the square.

Ask the boys what part is left if this quarter is taken away from the half.

Then ask them what fraction this remaining part is of the whole square.

They should be able to say that it is a quarter, or $\frac{1}{4}$.

Now point out that they have shown that $\frac{1}{2} - \frac{1}{4} = \frac{1}{4}$.

Again show them that one half is equal to two quarters, or $\frac{1}{2} = \frac{2}{4}$.

So $\frac{1}{2} - \frac{1}{4}$ is the same thing as $\frac{2}{4} - \frac{1}{4}$ which, as they have already learnt to prove, is $\frac{1}{4}$.

From this they can see that when we have to add or subtract fractions with different denominators we must first change them to fractions all having the same denominator but always of the original value.

We have seen that 2 quarters = 1 half or $\frac{2}{4}$ or $\frac{1}{2}$.

From Figure III, it will be seen that $\frac{1}{2}$ also = $\frac{3}{6}$.

We therefore have $\frac{1}{2} = \frac{2}{4} = \frac{3}{6}$.

Ask the boys what fact occurs in all these fractions. They will probably be able to see that in each the denominator is twice the numerator.

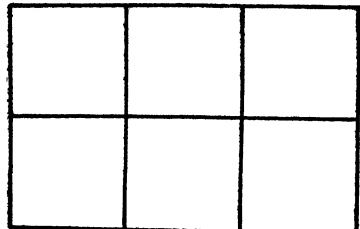


FIG. III

Now explain that in the same

way all fractions in which the denominator is twice the numerator are equal to $\frac{1}{2}$.

Give similar examples, such as

$$\frac{1}{3} = \frac{2}{6} = \frac{3}{9} = \frac{5}{15}.$$

In Figure IV the square is divided into 6 equal parts.

Each part is therefore $\frac{1}{6}$ of the square.

The horizontal line divides the square into 2 equal parts, each of which is $\frac{1}{2}$ of the square.

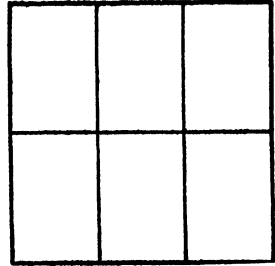


FIG. IV

Ask the boys how many 6th parts there are in $\frac{1}{2}$ the square. They will probably be able to see that there are 3.

Point out that the half square may therefore be written as $\frac{1}{2}$ or $\frac{3}{6}$.

Now ask how many 6th parts will be left if we take one 6th part away from the half square.

They will be able to say that two remain. Ask them to write this in arithmetical form, i.e.

$$\frac{1}{2} - \frac{1}{6} = \frac{2}{6}.$$

Some of the boys may now be able to see for themselves the way to work this arithmetically.

If all cannot do this, point out that they already know that $\frac{1}{2} = \frac{3}{6}$, and that the equation can be written as $\frac{3}{6} - \frac{1}{6} = \frac{2}{6}$, which the boys will all recognize as correct.

Now explain that in all cases of addition or subtraction of fractions with different denominators we must change the fractions to other forms of equal value, all of which have the same denominator.

Let the boys try to simplify

$$\frac{1}{2} + \frac{1}{4}; \quad \frac{1}{3} + \frac{1}{6}; \quad \frac{1}{3} - \frac{1}{6}; \quad \frac{1}{6} - \frac{1}{12}; \quad \frac{1}{4} + \frac{1}{8} - \frac{1}{16}.$$

In each case the boys should draw a figure containing the required number of equal parts, and find out practically what number of such equal parts are contained in the total of the separate fractions.

Make sure that the boys understand that $\frac{1}{3} + \frac{1}{6}$ is not $\frac{2}{3}$ or $\frac{2}{6}$, any more than 1 orange + 1 plantain would be equal to 2 oranges or 2 plantains.

Only things of the same kind can be added or subtracted.

We must therefore make all the fractions of the same kind before we deal with them.

Therefore $\frac{1}{3}$ must be written as $\frac{2}{6}$ before we can add to it $\frac{1}{6}$.

Now suppose we want to add

$$\frac{1}{2} + \frac{1}{4} + \frac{1}{8}.$$

The boys can work out on a figure, or may now be able to see without help, that the fractions must be written as follows :

$$\frac{4}{8} + \frac{2}{8} + \frac{1}{8} = \frac{7}{8}.$$

There is no difficulty about such fractions, but if we have such fractions as the following we cannot use such simple methods :

$$\frac{1}{3} + \frac{1}{4} + \frac{1}{6}.$$

The boys may be asked to draw the following figure (V).

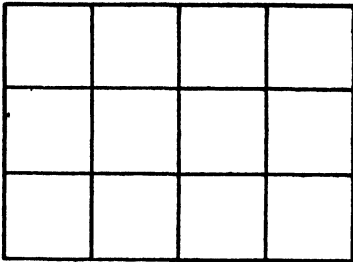


FIG. V

They may count the total number of equal parts, and also the number of such parts in $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{6}$ of the whole figure.

Each of the fractions may then be written in its new form, i.e. as :

$$\frac{4}{12}, \frac{3}{12}, \frac{2}{12}.$$

The boys can now add them and give the answer $\frac{9}{12}$.

Now ask whether any boy can explain why we divided the figure into 12 parts.

Point out that 12 is the smallest number which can be divided by 3, 4, and 6.

Any other number which can be divided by 3, 4, and 6 would have been equally correct, but would have required the use of larger numbers.

Give an example.

In Figure VI, we have 24 equal parts.

$$\frac{1}{3} + \frac{1}{4} + \frac{1}{6} \text{ would be equal to } \frac{8}{24} + \frac{6}{24} + \frac{4}{24} = \frac{18}{24} = \frac{3}{4}.$$

A number which can be divided by several other numbers is called a common multiple of those numbers.

Explain this very carefully and make sure that the boys understand it thoroughly.

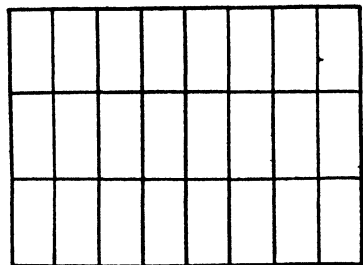


FIG. VI

We generally use the smallest common multiple in order to simplify our work.

It is useful to have a simple method of finding the smallest common multiple quickly.

The method is as follows:

Suppose we want to find the least common multiple of 2, 3, 4, 6, 8, 12, 16, 24.

Now if the required number is a multiple of 4, it must also be a multiple of 2.

Give some examples of this.

12, 16, 32, 40 are all multiples of 4, and they are also multiples of 2.

If you can divide anything into 4 equal parts, it is clear that 2 of these parts will make one half of the thing.

Two is therefore a divisor of any number which can be divided by 4.

Similarly any number that is a multiple of 6 is also a multiple of 3.

We therefore see that if any of our numbers is a factor of any of the other numbers it will divide any common multiple which the larger number will divide.

We may therefore ignore all those numbers which are factors of others of our numbers.

We therefore strike out, 2, 3, 4, 6, 8, 12 as these are factors of 4, 6, 8, 12, 16, 24 respectively.

We are then left with 16 and 24.

What is the smallest common multiple of these two numbers?

First of all, have they any common factor? Is there any number that can divide both of them?

2, 4, 8 are all common factors of both. If we divide 16 and 24 by 8 what are the results? We get 2 and 3.

$$16 = 2 \times 8$$

$$24 = 3 \times 8$$

Now what is the smallest multiple of 16 which is also a multiple of 24?

From the equations we see that 8 is a common factor of both 16 and 24, so that any number that can be divided by 16 and 24 must contain 8 as one of its factors. We therefore take 8 as one factor of the required multiple. What are the others?

If the number is to be divisible by 16 we shall have to take 2 as another factor as $8 \times 2 = 16$.

If it is to be divisible by 24 we shall have to take 3 as another factor as $8 \times 3 = 24$.

8 and 3 and 2 must therefore all be factors of the required number.

$8 \times 3 \times 2 = 48$ and this is the smallest number that is divisible by both 16 and 24.

So we see that to find the L.C.M. of any number we have to take

any factor that is common to all the numbers and multiply it by any factors that are not common.

Now try this rule with the following numbers :

6, 15, 21, 27.

The factors of these are

2×3 ; 3×5 ; 3×7 ; $3 \times 3 \times 3$.

The common factor is 3, and the factors that are not common are

2, 5, 7, 3×3 .

The L.C.M. will therefore be

$3 \times 2 \times 5 \times 7 \times 9 = 1890$.

Now ask the boys to find out the L.C.M. of 2, 4, 6, 9, 15, 18, 27, 30.

See that they first strike out any numbers that are factors of other numbers.

They are left with

4, 18, 27, 30.

Ask them to say if there is any common factor of two or more of these numbers.

They will probably say 2.

Then tell them to divide by 2 :

$$\begin{array}{r|l} 2 & 4, 18, 27, 30 \\ & 2, 9, 27, 15 \end{array}$$

Now if 27 is a factor 9 must also be a factor so it may be struck out.

We then have 2, 27, 15.

3 is a factor of 27 and 15, so we divide by 3.

$$\begin{array}{r|l} 3 & 2, 27, 15 \\ & 2, 9, 5 \end{array}$$

There are no more common factors, and we have taken out the common factors 2 and 3 and have been left with the other factors 2, 9, 5.

The L.C.M. will therefore be

$2 \times 3 \times 2 \times 5 \times 9 = 540$.

Other examples should then be given, such as :

5, 7, 10, 14, 21, 30, 28.

3, 4, 9, 16, 36.

12, 15, 60, 45, 36.

Be careful to see that the boys learn to strike out unnecessary numbers as soon as possible, and to divide first by the largest common factor.

Both these methods reduce considerably the labour of working.

It is common to see boys working L.C.M. sums in the following way :

$$\begin{array}{l}
 2 \mid 2, 3, 5, 6, 8, 16, 18, 20, 35, 42, 56 \\
 2 \mid 1, 3, 5, 3, 4, 8, 9, 10, 35, 21, 28 \\
 2 \mid 1, 3, 5, 3, 2, 4, 9, 5, 35, 21, 14 \\
 3 \mid 1, 3, 5, 3, 1, 2, 9, 5, 35, 21, 7 \\
 7 \mid 1, 1, 5, 1, 1, 2, 3, 5, 35, 7, 7 \\
 5 \mid 1, 1, 5, 1, 1, 2, 3, 5, 5, 1, 1 \\
 \quad 1, 1, 1, 1, 1, 2, 3, 1, 1, 1, 1 \\
 \quad 2 \times 2 \times 2 \times 3 \times 7 \times 5 \times 2 \times 3 = 5040.
 \end{array}$$

Intelligently worked, the sum is as follows :

$$\begin{array}{l}
 7 \mid 2, 3, 5, 6, 8, 16, 18, 20, 35, 42, 56 \\
 \quad \quad \quad 2 \mid 16, 18, 20, 5, 6, 8 \\
 \quad \quad \quad 2 \mid 8, 9, 10 \\
 \quad \quad \quad 4, 9, 5 \\
 \quad 7 \times 2 \times 2 \times 4 \times 9 \times 5 = 5040.
 \end{array}$$

In the one case the boy is obviously using no intelligence but merely working mechanically, and probably not understanding the reason for any portion of his work.

In the other case the boy is obviously learning to think, and to understand the reasons for his actions.

So far we have taken for granted that a boy can see that $\frac{10}{30}$ is the same thing as $\frac{1}{3}$ just as $\frac{1}{2}$ was equal to $\frac{6}{12}$.

When we begin to work with large numbers it becomes necessary to use an easy method of reducing several fractions to equivalent fractions with a common denominator.

We saw that $\frac{1}{2}$ was equal to $\frac{6}{12}$, and that $\frac{2}{3}$ was equal to $\frac{4}{6}$. A fresh reference to Figures V and III will make this clear to the boys.

We see that in the case of $\frac{1}{2} = \frac{6}{12}$, if we divide the new denominator by the old one we get the new numerator.

In the case of $\frac{2}{3} = \frac{4}{6}$ there is slight difference. The numerator is not 1 in this case but 2.

If we had $\frac{1}{3}$ and wanted to find an equal fraction with 6 as its denominator we could divide 6 by 3 and our new numerator would be 2 and the new fraction would be $\frac{2}{6}$.

As, however, our numerator is 2 and the fraction is $\frac{2}{3}$ it is clear that our new numerator must be twice what it would be if the fraction were $\frac{1}{3}$.

From this we can form the rule that to find the numerator of a fraction with a given denominator, and equal to a given fraction we must divide the new denominator by the original denominator and multiply the answer by the original numerator. E.g.

Find a fraction with denominator 24, equal to $\frac{3}{4}$.

Divide 24 by 4, and multiply by 3. The answer is 18.

Our new fraction is therefore $\frac{18}{24}$.

The boys can prove by a figure that $\frac{3}{4} = \frac{18}{24}$.

We can now find fractions with a common denominator and equal to any fractions that we want to add or subtract. E.g.

$$\frac{7}{10} + \frac{6}{8} + \frac{12}{25} + \frac{14}{16}$$

We must first find the lowest common denominator, that is, the smallest number divisible by all the denominators.

$$\begin{array}{r} 5 \mid 10, 8, 25, 16 \\ \quad \quad \quad 2, \quad 5, 16 \\ 5 \times 5 \times 16 = 400. \end{array}$$

Now divide 400 by 10 and multiply the answer by 7. We get 280.

$$\begin{array}{l} \frac{7}{10} \text{ therefore } = \frac{280}{400} \\ \text{Similarly } \frac{6}{8} = \frac{300}{400} \\ \frac{12}{25} = \frac{192}{400} \\ \frac{14}{16} = \frac{350}{400} \end{array}$$

Adding the numerators we get a total of $280 + 300 + 192 + 350 = 1122$, and our fractions are together $= \frac{1122}{400}$.

The class should be given practice in working similar sums till all the boys can do them rapidly.

For example take the sum

$$\frac{1}{3} + \frac{1}{5} + \frac{1}{6} + \frac{1}{10} + \frac{1}{15}$$

Before we can add the numerators we must change all the fractions into equivalent fractions with a common denominator. We have therefore to find the L.C.M. of the denominators

$$3 \overline{) \begin{array}{l} \frac{1}{3}, \frac{1}{3}, 6, 10, 15 \\ \frac{2}{3}, 10, \frac{1}{3} \end{array}}$$

$$3 \times 10 = 30.$$

The fractions are

$$\frac{10}{30} + \frac{6}{30} + \frac{5}{30} + \frac{3}{30} + \frac{2}{30} = \frac{26}{30}.$$

Subtraction is of course done in exactly the same way. E.g.

$$\frac{3}{4} - \frac{1}{8} + \frac{4}{6} - \frac{1}{12}$$

$$4 \overline{) \begin{array}{l} 4, 8, 6, 12 \\ 2, \quad 3 \end{array}}$$

The L.C.M. of the denominators is 24. The fractions are therefore equal to

$$\frac{18}{24} - \frac{3}{24} + \frac{16}{24} - \frac{2}{24}$$

$$18 - 3 + 16 - 2 = 29$$

The answer is therefore $\frac{29}{24}$.

To simplify work it is usual to write the sum as follows :

$$\frac{18 - 3 + 16 - 2}{24} = \frac{29}{24}.$$

But this is not necessary, and should not be done till the boys are able to work freely with separate denominators.

No attempt need be made at this stage to deal with mixed fractions.

The boys should spend some days in working examples in addition and subtraction. Examples can be taken from any arithmetic book or invented by the teacher.

Before any further steps are taught the boys should be able to work a sum such as the following in 3 minutes or at the rate of 10 sums in half an hour.

Simplify :

$$\frac{1}{2} + \frac{7}{8} - \frac{5}{6} + \frac{4}{5} - \frac{2}{15}.$$

Until the boys have at least this facility it is sheer waste of time to proceed further.

G. A. SMALL

(To be concluded in the June number)

THE TEACHING OF ARABIC. II

Grammar and Language

(a) GENERAL

THE following hints will be found useful :

1. The proper use of the definite and indefinite articles in Arabic is rather difficult, and Indians as well as Persians are liable to make mistakes very often in using them, unless they have learnt the subject properly. But in spite of its importance the subject is generally neglected by teachers at the early stages of teaching which are just the time to take it up. The teacher must make a sharp distinction between the adjectival and possessive composita. This distinction should be explained in as simple a manner as possible, and then the teacher must give a fairly large number of exercises to be done by the students in class as well as at home.

2. The so-called nominal sentence is peculiar to Arabic, and of course other Semitic languages, and can fortunately be taken up before the child has learnt the paradigms of the verb. This item also requires exercises in the same way, and these are very useful because children are able after only a few exercises to construct this particular kind of sentences which do not require the help of a verb.

3. Along with Nos. 1 and 2 the teacher should give to his class an idea of the various formations of the Arabic plural, beginning with the sound plurals and gradually going on to the more usual forms of the broken plural.

The broken plurals are rather difficult to master and it takes a long time to learn their numerous forms. The teacher is, therefore, warned against trying to give all the forms to his pupils within a short time, for this might naturally perplex young minds.

4. The dual should follow the plural.

5. Rules of gender in Arabic are simple and they can be explained to the beginner without much difficulty. So they must be taken up, of course with exercises, at an early stage. The exceptions to the general rules of gender should be given a few at a time.

6. The Arabic numerals, ordinal as well as cardinal, are generally not taught in the beginning. This is a mistake. They should be taught at an early stage and children should be properly drilled in their use. Their grammatical aspect may be dealt with at a later stage.

After this has been done, the pupils will be able to understand simple sentences involving the use of such words as they by this time know, and the constructions which are included in the above scheme.

At this stage the teacher should undertake with his class a revision of work done. He may also give some more exercises, if necessary. This having been done, the following heads should be taken in serial order,

1. Isolated personal pronouns should first be taken and used in sentences so that pupils get thoroughly acquainted with them. Immediately after this the pronominal suffixes should be taught as suffixed to the various forms of the noun. Plenty of exercises are required and these the teacher should collect and write out before he begins his class work. The pronominal suffixes to verbs should be postponed till the pupils begin the verbal paradigms which in themselves contain these suffixes. It remains for the teacher here to compare these suffixes with those used with the nouns, so that the pupils learn to distinguish between the nominal and the verbal suffixes.

2. It would be advisable to take the adjectives immediately after the pronouns have been finished. The adjectives should not only be given in their singular masculine, singular feminine and plural forms but also with the definite and the indefinite articles, viz. *al* and *un*. At this stage the teacher can again amplify the number of his exercises by adding a little longer nominal sentences, using all the materials learnt hitherto.

Some of the most necessary prepositions, the conjunctions and the demonstrative pronouns have naturally to be learnt by the pupils at suitable stages, as necessity arises. The syntactical effect of the prepositions must not be dwelt upon by the teacher at length. He should tell the pupils only as much as is absolutely necessary.

3. In teaching the verb the first thing to be taken is the simple triliteral strong verb in its past tense (*ماضي*) or perfect form, as it is called by European scholars. The imperfect form (*مضارع*) and the imperative, etc., should be taken later. The verb selected for the first lesson should not contain any such letters as would be difficult for the pupils to pronounce. The whole paradigm must not be given to the pupils all at one time, but the various forms should gradually be taught with the help of short sentences constructed with that particular verb till the whole paradigm is finished. By doing so students will get acquainted with the various forms without much toil and will soon be in a position to learn the whole paradigm in the manner given in textbooks of grammar. At this stage it would be quite useful to give a few short sentences in the vernacular to be translated into Arabic which will contain the various forms of the same verb. Secondly, a few other verbs of the same type should be given, and the pupils will be asked to construct the whole paradigm of each verb given and to use it in Arabic sentences. With each lesson the teacher should try to give his pupils a number of new words to learn, thus

building up a vocabulary. After this, certain auxiliary verbs or verbs of incomplete predication should be taken up. The pupils should also be made to learn certain particles, such as the interrogative and the negative particles, which will help them in framing interrogative and negative sentences. As soon as the pupils have learnt this much, the imperfect form of the verb or the aorist should be taken and dealt with in the same manner as the perfect. The imperative should follow the imperfect, so also the active participle, and then the verbal substantive or the infinitive. And in the same manner as the active voice of the verb has been taught, so the passive voice of the verb and the passive participle should now be taught.

So far the purely trilateral strong verb has been taken. The more difficult part of the verbs remains yet to be done. This is (1) the weak verbs involving the *ta'īl*, and (2) the various augmentative verbal forms known in Arabic grammar as the *abwāb* of the verb. As far as the former are concerned, only a very few verbs and those involving the simplest and least of *ta'īl* should be dealt with, and in the form of a paradigm, not in the old way of giving a chain of reasoning, which the young student can hardly follow. The latter category of forms will be dealt with below,

(4) There are, however, within the purely trilateral verb five different forms according to the different vocalization of the second radical. It must be made clear to the pupils that this vocalization is peculiar to certain words, not that every word can be used with various vocalizations. This is a circumstance which has no parallel in Indian vernaculars or, as a matter of fact, in any non-Semitic language. The teacher should be in a position to judge the capacity of his pupils to understand this phenomenon of the Arabic language and find means to teach it accordingly.

(b) THE AUGMENTATIVE FORMS OF THE VERBS

In all languages the number of roots is so small that without an extension of the primary roots it would be impossible for even a moderately civilized people to express their ordinary ideas. Different languages show different schemes of the extension of the primary roots. In all Aryan languages we see that a number of prefixes give various shades of meaning and, in fairly numerous cases, entirely different meanings to one and the same root. Taking for instance an example from English, viz. *press*, its extensions are *ex-press*, *im-press*, *sub-press* (*suppress*), *ob-press* (*oppress*), *com-press*, *de-press*, etc. This and many other examples taken from English are of Latin origin. Examples could also be cited from Greek, German, etc., as well as from Sanskrit and ancient Persian. In post-Islamic Persian, having lost a

number of archaic prefixes, there appear to be comparatively much fewer verbs with prefixes. Of this I speak in some detail in the article which is to follow this on the teaching of Persian. As for the Semitic group of languages, of which Arabic is an important member, there are in it practically no prefixes. The original, mostly trilateral, form of a root is augmented in various ways to express the different shades of meaning, the difference in the meanings of the original form in certain cases being entirely different from the meaning of an augmented form. The device followed to form these augmentatives is analogous to that of the broken plurals; the root is broken up and one or more of the letters known as augmentative letters are inserted between the radicals. In certain cases a letter of the root is doubled, in others one of the augmentative letters is also prefixed without disturbing the order of the letters of the root. The derived forms of the trilateral verb are usually reckoned to be fifteen in number, but eleven or twelve only are important. These various derived forms are called *abwāb* (plural of *bāb*) by Arabic grammarians. To each *bāb* are ascribed by grammarians a number of properties. Teachers generally give these properties to their pupils to be learnt by heart, whereby the pupils very seldom understand what is really meant by a property and what importance a *bāb* has. Teachers are generally satisfied if the pupils have learnt the properties by heart and are able to repeat them, when asked to, like a parrot. What is required is to explain to the class, with the help of examples from English and Persian, the difference between the scheme of augmentation in the two distinct types of languages, and then explain to them clearly the part played by these derived forms of the Arabic verb. Another wrong idea to be found among students learning Arabic and, I am afraid, in certain cases, among teachers of Arabic themselves, is that each and every ground form of a verb can be transferred into any of the fifteen derived forms. This is not so. It is not grammar but usage which decides whether a particular ground form can or cannot be conjugated according to a particular derived form.

The teacher should also in this case make a list of small, simple sentences chosen from a good Arabic text in which occur the various forms. The pupils should be asked to read and translate correctly these sentences. While this is being done, the teacher should try to make them appreciate the difference in the meanings of the various forms. He may then give the rule, explaining the property of the form exhibited by the example concerned. The more advanced pupils should also be told how to find a derived form in their dictionary.

The derived forms of the quadrilateral verb are only three, and these may be treated in the same manner as those of the trilateral verb.

The weak or the irregular verb is really a difficult part of Arabic etymology and ancient grammarians have treated the subject in a manner which is not very lucid. The best plan is for the teacher to make a digest of the rules and give them to those pupils who are learning the paradigms of the various types of irregular verb. If these paradigms are properly learnt, most of the rules of *ta'wil* will be rendered superfluous.

(c) NOUNS DERIVED FROM VERBS

In Arabic there are two kinds of nouns, one the noun substantive, the other the nouns derived from a verb. The former naturally are to be taught at the earlier stages, but the latter should be postponed till the pupils have done the verb, along with which they should also take the verbal nouns.

(d) APPROPRIATE PREPOSITIONS

Appropriate prepositions play a very important part in Arabic. Just as the derived forms of the verb sometimes affect very serious changes in the meanings, so also may a preposition used along with a verb. Such use of prepositions is regulated more by usage than by rules. The usage is, as in all other matters, to be ascertained from a lexicon.

(e) SYNTAX

Arabic syntax should be taken after the pupils have had a good grounding in etymology. In syntax, as in other heads of teaching already noticed, the example should precede the rule of grammar.

Course of Study

The teacher has to regulate his activities according to the courses prescribed, but every teacher is free to use his own method, considering the condition of his class. It would, perhaps, be advisable to use the plan adopted by the various graduated series of textbooks used in the schools of Syria and Egypt. Some of them are very good indeed and might be adopted by Indian schools with advantage.

In the earlier stages of Arabic teaching, only books with fully vocalized text should be used. At a more advanced stage semi-vocalized texts may be used. The advantage of this will be that pupils, although they have not done their syntax, will by constant practice gain the habit of correct reading, which habit will in higher classes be explained to them by the rules of etymology and syntax. At the High school stage such texts are to be used as have only those words vocalized which admit of more than one correct reading. All the rest of the text should be unvocalized. During the final year of study at High school unvocalized prose and poetry texts should form part of the work to be

Exercises in composition should be carefully selected by the teacher and should be undertaken regularly. Translation from the vernacular or English into Arabic and vice versa should form part of these exercises.

The Use of the Dictionary

The use of an Arabic dictionary is not at all a simple affair, because Arabic dictionaries are arranged according to the roots, and not according to the words individually. Unless one is able to find the root from which a particular word is derived, one cannot find the word in a dictionary. In other words, a student must be well up in Arabic etymology before he can use a dictionary.

There are two types of Arabic dictionaries available: one is the original Arabic lexicon which, for several reasons, cannot be used at all by beginners; the other more modern type of dictionary is that in which Arabic roots are arranged in the usual alphabetical order, resembling to a great extent the order adopted by English dictionaries. An Arabic-English dictionary of this type can be used by students who have learnt their etymology well and are instructed properly in consulting a dictionary, and this should be done as soon as a teacher is sure that his pupils are able to avail themselves of dictionaries. Hava's *Arabic-English Dictionary for the Use of Students* may be used for this purpose with advantage.¹ More advanced students, viz. those reading in the ninth and tenth classes, may be instructed by the teacher to use original lexicons, the arrangement of words in which is not so simple. But a student of Arabic, before entering a university, must be able to consult an original lexicon.

That old habit which pupils have of asking the teacher the meanings of words and then noting them between the lines of the textbook should be studiously discouraged. The teacher will be well advised to ask his pupils to make a list of words not known to them in a passage of five or six lines. The teacher should then ask his pupils to find the respective roots from which those words are derived. When a root has thus been determined the pupils should consult their dictionary and put down against each root the root-meaning or meanings, and then put down the appropriate meanings of the derived form or forms of the root which occur in the passage in question. The teacher then corrects any mistakes made. These exercises may appear tedious but an intelligent teacher will, by a moderate use of them, create a lively interest in a very short time. This sort of interest created in young pupils will endure and will lay the foundations of an intelligent and

¹ It should, however, be noted that the author, not being an Englishman, has here and there used erroneous English words or forms.

intensive study of the language. At the same time the pupils will, after having done a number of such exercises, gain a very good grounding in Arabic etymology.

The teacher must all along try to make it clear to his pupils that they should not imagine that all the meanings or explanations given under a particular word in a dictionary will satisfy every context ; and that, firstly, no two words in one and the same language are identical synonyms and, secondly, that a word of one language does not necessarily have an equivalent in another language.

There is a very great pitfall in the way of those students of Arabic whose mother-tongue is Persian or Urdu. As soon as they get a little advanced in Arabic, they find that a very large number of Arabic words are known to them from their own mother-tongue. They do not, however, know that in a fairly large number of cases an Arabic word borrowed into Persian or Urdu had assumed a sense which was not known to the Arabs at all. The result of these misconceptions is that the student, when he comes across such words in an Arabic text, mistranslates, or, when he is writing a piece of composition in Arabic, he uses them in an un-Arabic sense. Similarly, Persian or Urdu idioms are often translated literally into Arabic, making the rendering simply ridiculous. This tendency should be very carefully looked for by the teacher, who should from time to time warn his pupils against such blunders. Instances of this sort of erroneous use of words and expressions could be easily collected by a teacher. An Arabic scholar once wrote in Arabic a very stupid sentence which could only be translated as follows: 'The wise man came and looked at the pulse.' He meant to say: 'The physician came and felt the pulse.' The teacher must, therefore, see that his pupils learn to translate sentences and not merely to translate the words a sentence contains.

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A. SIDDIQI

(An article by the same writer on 'The Teaching of Persian' will appear in the June number)

AN URBAN TEACHER'S TRAINING CLASS AND VILLAGE LIFE

GIVEN: A class of twenty-five young Indian women in training for the teaching profession, aged seventeen to twenty-four, studying in a large town, and most of them coming from homes where a fair level of education and culture prevails. **Required:** To bring them during their training into as vital a contact as possible with village life and conditions.

That was our problem and one not easy of solution, yet urgent, for the last thing our young people desire when they graduate is to be sent to a village school, where really they are needed most. That is exile, hardship. Those who have the necessary stamina and pluck are held back by the vehement protests of their parents—easily held back, because they only volunteer to go out of a sense of duty. We felt that knowledge of the need would bring a greater desire to help in the task of village uplift, such a desire as would overcome parents' objections, love of ease, fear of the unknown.

Lantern lectures on village uplift, or even discussion groups, are not sufficient. What they engender is a vague feeling of compassion, of helplessness, even of repulsion. How could anyone put into practice training school methods amid such surroundings, in such buildings, with such uncared for children? An object lesson seemed to be needed, or rather a practical experiment backed up by authority, in which a judicious mixture of motives, philanthropy, and that love of adventure which lies dormant in the stolidest of young people, would give the necessary impetus.

The time chosen was the end of the January term, between the first and second year of training, and the scene of the experiment was two villages forty miles from the town where the students were in training. Our plan was to take out to these two villages two groups of students, eight in each group, and to hand over to them the village school, to be run by them entirely for the last fortnight of the term.

A few words must be said about the schools in question. They differed largely from each other, which in a way was unfortunate, as the initial preparation had to be made *en bloc*; we could not spare too much time beforehand with an exacting government curriculum to cope with. However, comparing notes afterwards was a very profitable business on account of this very diversity.

One school served the needs of a little self-contained community of Christians, village folk of very meagre education. The building

was bad, the parents very indifferent as a rule about their children's education; the brighter children were usually drafted off into better schools in larger centres. The other school presented more exciting and difficult problems, but was fortunate in possessing a really good and suitable building with plenty of air and light, and a large playground. It served two little villages of outcastes—Adi-Dravidas—who were housed in such dirty, insanitary hovels, and were so desperately poor, that it was no wonder that most of them drank pretty hard. The teacher in this school for years had been an ignorant villager, and under him the numbers dwindled rapidly. Indeed it was difficult to see why the children came at all. It is with the fortunes of this school that this article is chiefly concerned.

Preliminary preparation occupied all the students' spare time for about a fortnight beforehand. The ideal thing, no doubt, would have been something on Project Method lines, but we felt the pupils were too much of an unknown quantity and the students too inexperienced for such a venture. The school only went up to the third standard; for these bigger children we planned a little course of work which aimed at making them acquainted with the geography of their own village and surroundings, and a few of the plants and trees and birds and animals which we could easily examine and watch. Handwork included a plan of the school, with which various arithmetic problems were correlated, and the making of palmyra leaf baskets. For reading we took little booklets which could be finished in the fortnight, containing stories which the children could dramatize, notably that of St. Christopher at the ford.

For the younger children the students prepared reading lessons on American cloth with bright chalks, and reading cards with the same vocabulary for individual work; we meditated reading on the sentence method for the babies, but it proved too difficult for the students, who obtained some quite creditable results from word and picture matching, and similar devices. Arithmetic was on practical lines, with plenty of apparatus. This was all home-made; the students were not allowed to take any of the teaching material got from Europe for demonstration purposes. The last day before setting out was spent not in personal preparations, as usual, but in collecting every possible kind of material—sticks, paper, corks, string, empty matchboxes, bazaar dyes, beads, marbles. It was a good omen.

The party of eight students with one of the staff was accommodated at a hospital about a mile away from the school. It was difficult to say on which side embarrassment was greater on the first morning, the ragged regiment of children, or the young teachers. As far as the children were concerned, surprise was added to embarrassment, but they

soon came to the conclusion that the whole thing was rather a joke, and cheerfully submitted to being sorted out into groups, and taken in hand for the first time in their school career. From the beginning there was never any trouble about discipline—over and over again the students commented on the excellent manners of these outcaste children. The difficulties lay in other directions, notably inertia and persistent inattention, due largely to the fact that many of them had been coming to school for years, and simply 'sitting', as the expressive vernacular idiom has it. Malnutrition had a good deal to do with the inertia, no doubt. But it soon vanished under the influence of vigorous drill, singing games, and nature walks. Friendship was of quick growth that fortnight. In no time the students were stoutly championing the cause of their own particular children, and the latter, not content with escorting the party home from school, soon took to coming half way to meet their teachers in the morning. Every afternoon the four students who had not taught in the morning went down to the village to play with the children, and make acquaintance with the mothers. This was an essential part of our programme, but difficult to carry out. The students' reaction to the village visiting was very interesting. Some saw everything—the dirt, the squalor, the dire poverty, the disease—and some saw very little. Some who saw were haunted by the sight, others were more or less indifferent. Some were content to harangue the mothers about sending their children clean and tidy to school, others saw more of the inwardness of the problem, and wanted to know, as we all do, what ought to be done. As the days went on, the social aspect of the work became more conspicuous. An effort was made to get the mothers inside the school building to listen to simple talks on hygiene, but what with crying babies, and the novelty of the whole situation, not much was accomplished. The girls were discouraged, but their failure brought them to a valuable generalization: we have a better chance with the children.

Some hygienic measures are possible even in a village day school. Soap can be bought in bars and sold in pice worths, hands can be washed and hair combed in the school itself. The airy schoolroom, bright within the fortnight with pictures of their own making, set a standard to the children, who quickly formed the habit of dusting it and adorning it with flowers. Direct appeals to the parents seemed futile, but they haunted the school and one is inclined to think they too learned by the object lesson method. They stood in silent groups, watching the drill, watching too the lively energetic healthy girls in their spotless saris, comparing them perhaps with their prematurely old women folk, who knows? One has to take long views in estimating the worth of such efforts as these. In the evenings the whole party

visited various villages with a lantern and slides advocating temperance. The expositions on the first night were about as lame as we expected, but became more and more vivid and fluent. The fame of the pictures spread, and the local Boy Scouts organized quite a civic entertainment for the last display to the inhabitants of the town. One result of our village fortnight, not to be despised, was the getting into touch with local workers, to our mutual encouragement.

On the last day of the fortnight we had a *tamasha*. There was quite a creditable display of work—nature study notebooks, maps, palmyra leaf baskets and toys, clay-models. Each class acted a story, did a singing game and some drill, all with much enthusiasm. And then came the end. It was ridiculous and yet pathetic to see how unwillingly teachers and taught parted when the bus bore the students back to their training school.

It was not really the end at all. There were happenings later in the year when the students invited eight of the elder children to come and stay three days on the occasion of some Hindu feasts. The parents were evidently less suspicious of our motives than we had feared, as they readily agreed. The students did all the cooking and entertaining of their little guests, who behaved beautifully, and spent three rapturous days in parks, museums, and shops. Subsequently three of the boys have persuaded their parents to let them go on with their education, and study in a Middle school in the town. Not ideal, certainly, to leave the village environment—they should be able to get what they need in a community or vocational school nearer home. . . . But there is no such school, and one who knows the village and its folk well, herself an Adi-Dravida who has gone far, said of one of the younger lads who has spread his wings, 'There is a brightness in his face. He looks as those look who have come out of prison.' Alas, that such a comparison can aptly be made!

Let me sum up, as far as may be. The town students did come into living contact with village life, and the result in their case undoubtedly was an increase of sympathy and understanding, leading later to a willingness to work in the villages in several cases. It is less easy to estimate the result of the impact on the villagers. We were able to put in an excellent teacher shortly after our visit, and the school is not only filled to overflowing, but the caste people want to send their children to it, which certainly points to an increase of confidence. But the village to outward appearance is much the same. Must we wait for the children to grow up before there is a better state of things? Or has the time come for a much more serious and concerted effort to solve the village problem?

TEACHING READING TO BEGINNERS IN PRIMARY SCHOOLS. III

A General Outline of the form of daily work for the two phases for teaching Reading before the introduction of phonics in the third phase.

First Phase

PLAN of work for the daily Introductory Stage. Length of time of its continuance to be determined by boys' progress and the teacher's discretion.

I. FIRST PERIOD. 30 MINUTES. READING (CONVERSATION)

1. Give no books or reading sheets or charts (containing letters) to boys.

2. (a) Start with a very friendly and homely conversation about the cow.

(b) Give boys chances of talking.

(c) Teachers' questions regarding the boys' previous knowledge and experience of the cow, to get at and elicit the words in the first lesson, e.g. *gai* गाइ, *dudha* दूध, *ghasi* घसि, *mitha* मिठा, *chhena* छेना, *gobara* गोबर. Reference is to the primer, *The Sahaja Pratham¹ patha*, written on this method but any 'Reader' could be prepared.

3. Don't attempt too much to bring in all the words in a single conversation lesson. The first half-hour of the first lesson should include only half a dozen words at best. Remember, the child is shy when he first comes to school as it offers him a new and an unknown world; hence the importance of homely conversation. Carefully prepare it and go at it with lively spirit and vigour.

Treat this as a purely conversational lesson. Think that talking and chatting to the boys is the only work for the period. Remember the six words (any six you choose). Here are some hints for bringing in any six words from the first lesson in the primer (or more or less, according to the teacher's judgement) in a conversational lesson.

In the play way, a first question like this can be put :

1. What different kinds of coloured cows has the class seen?—all boys to answer the question. Thus two words are elicited, *kali* काली (black) and *gai* गाइ (cow).

2. Why do we keep cows? What good are they? This will elicit *dudha* (milk), *gobara* (cow-dung) and *ghasi* (cow-dung cakes).

¹ Publisher, S. N. Chatterjee, M.S., Basumati Buildings, Calcutta. Teachers' edition, Price, As. 6 ; Boys' edition, Price, As. 3.

3. The teacher may next say 'Well, boys, the cow gives us something (milk) to drink. What do we get from milk?' to elicit *chhena* छेना. In this way, lively and animated conversation should go on giving the boys full liberty of speech and the freest scope possible for natural, free and familiar talk.

II. SECOND PERIOD. 30 MINUTES. WRITING

This period is to be utilized as follows :

Review the first period's work by asking the boys a question like this :

'What were we talking of this morning ?

'The cow, its milk, its colour, sweets made out of milk.'

Let the boys come out in volleys with their answers. Then the teacher will say, 'Now I am putting a cow on the blackboard. You put it on your slate or on the floor.' Give to this part of the work some time, if necessary devote the whole of the period for this work only, and a few succeeding days also, if required. This is not only meant to prepare the pupils' hands for writing but to help them in recognizing forms in print.

However imperfect the drawing of a cow, don't mind. Then say, 'Instead of drawing the cow, mark what I write'—and draw the word *gai* गाय (cow). Let the boys try to write similarly. Attempt, according to the boys' capacities, a few more words, e.g. *para* पार (spread) and *jala* जल but never force in too much.

III. THIRD PERIOD. READING

Picture work will be very useful now. The teacher should procure ordinary pictures. The school should have a supply of these. Emphasize *observation training* now.

Show pictures and ask about parts. Proceed from the obvious to the minute. Also draw on the blackboard if you can, and ask questions about parts of the pictures you draw.

Put up also on the blackboard the words done in the preceding periods and see which the boys can recognize. Don't be disheartened at failures. Make the pupils act the verbs according to various play methods, such as one boy hiding a word in his hand, another boy trying to guess which word has been hidden, and then reading it out.

The three periods of work will have a very great cumulative effect on the boys, as (1) common words used in the class room are being visualized through various forms of alternated work ; (2) boys are observing the written symbols of the things they are talking about ; and (3) they are also trying to put in writing the symbols themselves (as when they write *gai* or other words) for the things they know.

Caution.—Remember, it is never meant to be understood that a rigid adherence to the plan of work prescribed for the three periods is recommended from the very first day the child comes to school. It may become desirable simply to make pupils at home in the school for the first two or three days; and then simple conversation and friendly chat or play with them should go on during all the three periods of work, instead of doing literally what has been recommended. After the foundation of school life for the boys has thus been laid, the sequences of the day's working periods as indicated may be followed.

Second Phase

(The right time for the beginning of this phase, as also the length of period of its continuance, will depend on the pupils' progress and the discretion of the teachers.)

I. READING

Conversation.—Don't forget this; nothing succeeds better in bringing the boys into an interested work attitude than a friendly talk with them to begin with about the work in hand.

Review thus the preceding day's words, as also others learnt previously through intelligent conversational work, e.g. *gobara* गोबर (dung), *ghasi* घसि (cow-dung cakes). Begin with the picture of a familiar village scene (in case of urban schools something equally suitable should be thought out), then spring the subject matter on the class in the form of a question which they must answer. Have a picture of a village scene (or a blackboard drawing) as of a cow-pen and a girl. Talk about the girl's loitering with a basket near the cow-pen early in the morning. Ask why she is there. This will be a good and interesting problem for the boys to solve and different answers will add zest to the class: thus the required words also will be elicited, i.e., *gobara* गोबर (dung), *ghasi* घसि (dung-cakes), etc. Then tell the class to see how these words look when written on cards. Take each word singly and present flash cards. Let the boys read from the cards.

In this manner, after the old words have been gone through, take up a few new words according to the class attitude for more work. It is important that there should be no forcing or hurrying. Words such as *chhena* छेना and *ghee* घी might be taken for treatment.

For this, the words should as before be learnt from and through conversation. See that you get the words from the boys' mouths; this will keep them encouraged and when they guess the word, say encouragingly, 'Well done; now see how these look when written on paper and on the blackboard.'

Then flash these words again. Repeat the process. Alternate between blackboard writing and flashing.

II. WRITING

Review of old work and the words learnt in the preceding lesson.

Alternation of methods to keep boys interested should be practised, such as writing with cereals. Let the boys shape the forms of preceding words with cereals and then take up new words.

Writing on the floor should also be practised.

Finish up by a game as follows :

Put up in clear distinct print on the blackboard the words so far taught. Say, 'We are going to have a reading game. I call out a word and then when I say, "Hands up" all those who know the word called out put up their hands.' As hands are put up make the boys point out each word called out.

(Remember the writing which is made use of in these earliest stages is a help for reading and not solely meant for training in writing ; but at the same time guard against slovenly work on the boys' part and their getting into the habit of forming uneven slipshod letters.)

This honest attempt on the part of the teacher will bring activity, and thus the present monotony obtaining in schools, as seen in the rubbing of shapeless stone on the floor in the name of writing, will be replaced by alternated work of more than one form, viz. cereal work, boys writing on the floor, recognizing writing from the blackboard, all helping the recognition of the forms of the words learnt and at the same time offering enough, and good, writing work as well. This is the pedagogical use of the eye, the hand, the mouth and the ear of the child to teach simultaneously the mastery of recognition of the written language and help the power of his reading.

III. READING

Begin with the word treated in the first period of the day : any of the expedients such as (a) conversation, (b) printing of words on the blackboard, (c) showing the flash-card words, will do.

Go slowly ; establish well the words done to-day and then bring in two or three new words. Remember this is the last period for language work for the day. Avoid over-burdening.

Now with regard to these two or three new words which you want to establish in this period, adopt the following devices :

Remember that variety of work and alternation of methods constitute the soul of children's efforts. All the possible devices cannot

be exhaustively listed; the typical ones are suggested, leaving to the thought and ingenuity of teachers more inventions of their own on these lines.

(a) Pick out a few verbs which are action words, such as *ana* आन (bring), *pakaa* पकाअ (boil), *khaa* खाअ (eat), *kara* कर (do), *jala* जाल, and so on. Print these on the blackboard. Flash them with the help of the flash cards; get them recognized by the boys as much as possible, as a first step.

(b) Then adopt the following game. Say to the pupils that you want to play a game. The game is that the boys will act the verbs when put with a word to form a sentence. The words will be either put up by fixing flash cards against the wall or printed on the blackboard in writing. When so done, it will be a command; and whichever boy reads it will act according to the command. Thus each child will emulate the other in reading what is put up on the blackboard, thus helping quick recognition of words and reading. E.g. when *ghasi para* घासि पार (lay-out cow-dung cakes) is put up, everybody by a gesture of the hand will begin to go through the process of the preparation of cow-dung cakes. So again *gai ana* गइ आन (bring the cow) being put up, the picture of a cow will be brought by those who can read the sentence.

(c) In order to lend zest to the work, each child's name printed on the flash card may also be recognized. All the name cards may be mixed up and the boys asked to find their own. This will also lead to the recognition of many single letters of the alphabet and of combinations of them.

(d) When the names are obtained, individual names in turns can be put at the beginning of sentences, so that each child will have a turn and repetition will help the whole class. For example, before *gai ana* गइ आन, *Sama* शाम or *Rama* राम might be put in turns, so that it is both an individual and general class drill in reading done in form of a game. This is the combination of the word and sentence methods.

B. MUKHARJI

(To be concluded in the June number)

ON THE TEACHING OF ENGLISH POETRY

II

Outline of Course

WE must realize at the outset 'that we cannot call upon children to appreciate poetry which does not represent moods with which they are already familiar; or which employs images which they cannot spontaneously conjure up'.¹ The course of poetry will need to be graduated in a way that will depend on local conditions in different parts of India. Speaking generally we may divide the course into three stages:

First Stage.—In the first stage, i.e. the last class of the Elementary school, ballads and legends should be introduced. Ballad-poetry, being the poetry of a nation's infancy, is suited to the childhood of the individual. Let the children be taught to grasp the story, and let their interest be aroused. This is a means to an end. The end at this stage may be to teach them to apprehend rhythm, the first element of beauty they can perceive; or it may be to inculcate some ideal.²

Second Stage.—In the second stage, i.e. the first class of the Secondary school, longer (but simple) narrative poetry should take the place of descriptive ballads. The interest of the story grows more complex, the metre is more varied, and the language becomes more flowery and graphic.³

Third Stage.—In the third stage, i.e. the last class of the Secondary school, the poet comes before us as an interpreter of human nature and artistic beauty. A study of longer poems as artistic wholes is begun. Gradual evolution of character through the force of circumstances should be observed. For Indian students especially, the treatment of nature in English poetry will prove of great interest and value.

(a) *Lyric View of Nature.*—Wordsworth's *Stray Pleasures*, Tennyson's choric song in the *Lotos-Eaters*, R. Browning's *A Serenade at the Villa*.

(b) *Hellenic View.*—Love of nature for its beauty, but always in subordination to the human interest—a refined type of animism draping

¹ H. Green, *Day Dream*, p. 217. Hadow, *On the Teaching of Poetry*, is an excellent little book to consult; see also P. C. Wren, *Direct Teaching of English*, p. 219.

² Toru Dutt, *Ballads and Legends of Ancient Hindusthan*, or passages from Arnold, *Light of Asia*, or R. L. Stevenson, *Child's Garden of Verses*.

³ Kipling's poems of this type, or Henry Derozio's, or De La Mare's. Metrical translations of Indian legends may be used with care, e.g. A. A. Macdonnell's in the 'Heritage of India Series'.

the powers of nature in forms of beauty, like what is found in the *Rigveda*, 3.

(c) *Romantic View*.—Romanticism tends, as in Spenser, to become allegorical and to find inner meanings under outward forms.

(d) *Naturalistic View*.—We find nature accurately observed and carefully described, with interest and even reverence, but without passion and without any sense of inner meaning. Thomson, Shelley and Byron are examples.

(e) *Spiritual View*.—Nature becomes a living whole, a manifestation of God to man. Wordsworth is the best example.

Whatever is selected should be something that is not strange. As far as practicable the psychological should be preferred to the logical order, and the course graduated accordingly.

A Capital Difficulty

Verse precedes prose in literature; verse starts with musical accompaniment; musical accompaniment introduces emotion; emotion introduces an order of its own into speech.¹ This is what constitutes the capital difficulty of teaching poetry; and yet this is what constitutes precisely the capital advantage of teaching verse to Indian students. The teacher finds his pupils do not respond to his teaching. They seem to manifest no apperception: verse taxes their patience: they seem completely at a loss to understand the beauty he tries to show them. But on analysis is it not clear that the order which emotion introduces into speech when misrepresented and *prosified* causes the whole trouble? The pupil must be caught up into an atmosphere surcharged not with cold scholarship, but warm sympathy. The teacher must come down to the level of his pupils, be a child among children and a youth among youths to know what lies within their mental focus. His methods must suit the pupils first, then the subject.

Method

To be wearisome, Herbart remarks, is the cardinal sin of instruction. It is worse than a cardinal sin to be wearisome in the teaching of poetry. The seeds of aversion sown in the virgin soil of a child's mind soon grow to choke all poetical taste. Even Stevenson may have blasted 'many hours of an otherwise cheerful childhood', and be all but detested in after life. But Stevenson can and does appeal very much to children. It is entirely a matter of presentation. If he 'blasts many hours of an otherwise cheerful childhood', the blame for this must be laid where it properly belongs; which is not likely to be with the poet.² It is the same with other poets.

¹ Quiller-Couch, *On the Art of Writing*, p. 55.

² H. Green, *Day Dream*, Appendix C, p. 330.

Pupils are caricatured as unimaginative 'blockheads' and many another choice epithet is applied to them. The somewhat hasty conclusion is drawn that Indian pupils are not capable of appreciating and enjoying English poetry. 'Most teachers are discontented with the greater number of their pupils, but it is not so usual for teachers to be discontented with themselves.'¹ With sincere effort on the teacher's part a lesson in English poetry can be made fascinating as no other lesson can be.

FIRST STAGE

Preparation.—The meanings of all new words and their use must first of all be thoroughly learnt by the conversational method.

The teacher should *in the vernacular* give the class some clear notion of what the *complete poem* is about, and at the same time explain its *purpose*. After this he must assure himself that his pupils have thoroughly grasped his explanation.²

For simple ballad-poetry a little relevant questioning to recall familiar scenes will help the pupils.³

Presentation.—At this stage the poem may be rendered in action as it is being taught, provided the piece chosen is suitable for this purpose. The main function of the teacher will be to ensure *good reading*—training of voice and ear, cultivation of a sense of rhythm. But hammering out the metrical accents like a metronome, in defiance alike of sense and rhythm, and making a pause at the end of each line when there is none in the thought, must be eradicated.⁴

Whenever possible, to stimulate inquiry in other directions, the teacher should discuss with the class any questions legitimately arising out of the tale of the ballad. But the essential feature of the teaching is to educate the pupils to form their own opinion on the beauty of a scene. If it is inevitable, the aid of the vernacular may be enlisted even in the presentation.

But on the completion of a poem a final explanation of its meaning should be called for from the class in English; and passages that have appealed to the pupils should be taught for recitation.

SECOND STAGE

Preparation.—There may be a little talk about the life of the poet to arouse interest in the pupils, and about the circumstances that led to the writing of the particular poem. 'In introducing pupils to an English poem which you feel to be worth their learning and which

¹ Quick, *Educational Reformers*, p. 382.

² Stokes, *Reformed Method of Teaching English*, p. 116.

³ Illustrations, pictures, and blackboard sketches may be turned to good account.

⁴ Bates, *Teaching of English Literature in Secondary Schools*, p. 53.

they are likely to enjoy, some trouble can be taken to put them in the right mood for it first, e.g. by explaining its *motif* or dwelling on the circumstances of its writing.’¹

As an example of what is regarded as a legitimate ‘preparation’ by the new teaching as compared with the old, I quote the following reminiscent passage:

‘We were reading *The Lady of the Lake*, and the subject of the day’s lesson was the opening stanza of Canto V.—

Fair as the earliest beam of eastern light,
When first, by the bewildered pilgrim spied,
It smiles upon the dreary brow of night,
And silvers o’er the torrent’s foaming tide,
And lights the fearful path on mountain side,—
Fair as that beam, although the fairest far,
Giving to horror grace, to danger pride,
Shine martial Faith, and Courtesy’s bright star,
Through all the wreckful storms that cloud the brow of War.

‘It was a strenuous lesson. The stanza was torn to shreds. Word after word was put under the microscope and examined as to its grammatical relation, its literal or figurative use, its precise shade of meaning and its special appropriateness in the passage. I enjoyed the exercise, I believe, after a fashion, but I have a distinct recollection of my bewilderment after it was over and my feeling that I should like to know, after all, what the stanza was all about.

‘I remember, too, years later when I came to teach the passage, with what a thrill I discovered for myself what the stanza meant, and set about to find some means of helping my class to see its simple meaning and to feel for themselves as they read it something of the pleasure that I had missed.

‘I asked them to turn their books over for a moment and to imagine a traveller who has lost his way in the black night in a dreary mountain country. He cannot see the path, and is fearful that the next step will plunge him over a precipice into the roaring torrent below. Weary and disheartened as he is, what to him will be the most welcome and the most beautiful sight in the world? The sight of the first beam of morning light? Yes, that is beautiful; but the poet says there is something more beautiful still. Look at your books and tell me what it was.

“Martial Faith and Courtesy’s bright star.” What do you think is meant by “Martial faith”? “A soldier’s promise.” Where does a soldier’s promise come into this story? “Roderick Dhu has promised to guide FitzJames as far as Coilantogle ford.” To what does the poet compare the keeping of a soldier’s promise? “To the beauty of the first beam

¹ Wyatt, *The Teaching of English in India*, p. 148.

of eastern light when seen by the lost pilgrim." And now let us read the stanza again, and in reading it let us try, if we can, to express the poet's feeling.¹

*Presentation.*²—The preparatory step, if unavoidable, should be made easier by the help of the vernacular. The unknown should be based on the known. The method of procedure should be from the concrete to the abstract, so that the abstract is more completely understood.

It should be remembered that poetry transmits experiences of an emotional order, and hence, if poetry is to fulfil its high destiny, there is but one way, that of infusing into the pupil something of the spirit that moved the poet. 'In other words,' says Bagley, 'the media of emotional transmission must be met by an emotional interpretation.' Here it is that the skill of the teacher stands him in good stead. Here it is that we see clearly the function of the teacher is to inspire as well as to instruct. Here it is that Wyatt's counsel becomes very valuable; 'Do not teach the poems which you do not yourself appreciate.'

THIRD STAGE

Preparation.—If the poem is reflective the pupils should be asked what has been said on some leading thoughts in the piece by vernacular poets. If the poem is dramatic, interest should be aroused and made to focus on the hero. The preparation may in certain cases be similar to what has been observed in the second stage. But, above all, the teacher should aim at gripping the attention of the class and diverting it in the channel of literary appreciation. It may be a very rudimentary kind of artistic appreciation—the pleasure in the delineation of the familiar, the joy in seeing the connexion between painting and poetry, or it may be still more exalted—the rapture of forming a just estimate of the choice of words employed, the correspondence of sound and sense, the aptness of imagery, and, in short, of literary skill and poetical merit.

Presentation.—'It then remains for the teacher to discuss the poem with the class from the point of view of its purpose, meaning and beauty of thought and language, omitting minute analysis of the constructions and word meanings in so far as they are not essential to assimilating the poem as a whole.'³

Pupils should be led by suggestions to use their imagination. They should learn to see that descriptive poetry is not, like much of Walt Whitman, a mass of materials brought together but never

¹ O. J. Stevenson's article in the *English Journal* (Chicago) February, 1914. See also Adams, *New Teaching*, p. 68; and Wyatt, *op. cit.*, pp. 128-30.

² cf. Batchelder, *Notes on Teaching English*, Pt. I, pp. 80-82.

³ Stokes, *Reformed Method of Teaching English*, p. 119.

shaped into a building, but a work of art, a collection of pictures. Something of the intellectual pleasure derived from the reading of first-rate poetry should be laid bare to the pupils, who will soon be leaving school, and some of them quitting study, so that in the midst of a matter-of-fact world they may seek and find in poetry that truer consolation, that richer sustenance, and that spark of life which the soul of the poet has breathed into his work of art; so that they may realize 'a thing of beauty is a joy for ever'; so that they may be truly educated, steeped in the ampler culture found in English poetry.¹

Nevertheless, 'the fullest enjoyment of a poem is only possible when the images and their meanings, as well as the emotional tones accompanying them, blend and interpenetrate: and the continuous flow or movement of thought or feeling, which results from this interpenetration, is what I mean by "duration".'² Oscar Wilde calls it 'sincerity', Rabindranath Tagore terms it 'harmony', in ordinary parlance we say 'unity'. This *unity*, then, must be understood, and the understanding of it will bring enjoyment. Much more than the mechanical exercise of finding the factors of $a^2 - b^2$, or the solving of a geometrical theorem, will this literary exercise of enjoying the *unity* of a poem lead to education.

Concluding Remarks

Thackeray says somewhere that the first principle of successful wooing is to make oneself indispensable to one's mistress. The first principle of the successful teaching of poetry is precisely the opposite. The manipulation of the poem itself is one of the teacher's chief methods of enabling the pupil to do without him.

The door between the mind of the pupil and the mind of the poet should be so unlocked by the teacher as to allow free intercourse in the future without the teacher's mediation. Yet to do this the teacher must have the proper key. At the start, and all through, the teacher and his method of presentation, his taste and enthusiasm are the essential factors in the teaching of English poetry. 'He *draws out* in the young the intelligence and the sense of what is just, the love of what is beautiful, the admiration of what is noble; this he can do only by his intelligence and his own enthusiasm for what is just and beautiful and noble.'³ But this does not mean that teachers, like poets, are born. 'Genius' says Carlyle, 'is the capacity for taking infinite pains.' By unflagging industry and intelligent experiment a teacher can become a

¹ cf. Welton, quoted by P. C. Wren, *Direct Teaching of English*, p. 210.

² Dr. Olive Wheeler's 'Analysis of Literary Appreciation', *British Journal of Psychology*, January, 1923.

³ Quick, *Educational Reformers*, p. 380.

'classroom artist'. The teaching of no other subject demands the teacher's being a 'classroom artist' to the same degree as the teaching of English poetry. Difficult and even arduous as this teaching is, shall we ignore and neglect a subject of such vast importance? Life, under the strenuous climatic conditions of India, needs to be infused a little with the lyrical joy of poetry; and shall the teacher of English relinquish an ambition so laudable because it means, perhaps, a little trouble?

CYRIL MODAK

A PROJECT FOR STUDENTS OF DRAWING

THE project method is a teaching device whose educational value has been very widely recognized.¹ This article is an account of a project worked out by the students of drawing in the Hindu school at Karwar.

The project arose out of a long-felt need of the school. There was a general desire among teachers, and more so among students, that the school should possess a name-plate and the different classes a small plate each bearing the standard and division on it. One would ordinarily get this done by a local professional painter, but when the drawing master proposed that his students should be given an opportunity of showing what they could do in this direction, all agreed.

At this time, the drawing master happened to be conducting special classes for students about to appear for the two drawing examinations. He put his new proposal before them. Boys by nature like fruitful activity, and the drawing students were no exception. They saw that for once their lessons on 'Lettering' and their skill with the brush would be put to some use. Hence they readily fell in with the proposal.

Stevenson defines a project as 'a problematic act carried to completion in its natural surroundings'. Our boys attacked the work before them thus:

Firstly, they determined, as closely as was possible for them, the amounts of material required; secondly, they estimated the costs; and thirdly, if one may use a big word, they studied the technique of painting.

When all this was done and well understood by the boys carrying out the project, then only was actual work begun. It ought to be stated here that the boys had among them one who had done some amateurish work of this type. His presence was a great help, but even without

¹ See article by H. R. Hamley, 'The Project Method in the Secondary School', *TEACHING*, Vol. I, No. 3.

such help there is no doubt that, with a little guidance, other boys by themselves could do what our boys have done.

First of all, a list of the more important articles that would be required was made. This included tinsplate, paints, turpentine and brushes. The next thing was to consider how much of each was required.

The calculation of the amount of tinsplate to be bought necessitated a knowledge of areas. Boys who had already learnt this branch of mathematics found in this an opportunity of applying their knowledge to some practical purpose, while others had to develop the principles required by consulting their fellow-workers who had previous knowledge. All plates for the twelve divisions in the school were made of the size $12\frac{1}{2}$ inches by $4\frac{1}{2}$ inches. This common size was decided upon after an examination of all the classrooms. Owing to variations in numbers and other considerations, no class generally gets the same room for two successive years and hence the plates must be such as would fit any door frame. The plates were also of just the proper length for holding the letters STD. VII, or STD. II B, and so on. Two more plates of a larger size, 18 inches by 4 inches, for the drawing class and the laboratory, and eight more of a size intermediate between the other two, for the laboratory cupboards and other purposes, were required. The largest one was, of course, the name-plate for the whole school. This was 2 feet by 3 feet. All told, the area of the tinsplate came to 1926 square inches. But in buying the plate it was found that it was sold in square pieces of a definite size only, and so it was necessary to buy a little more than the calculated area. This extra piece was found left over after the completion of the work.

The quantity of paint required was then estimated. Black paint was required for forming the background on all plates, white for writing the letters, and red and yellow for providing shade to the letters. As the exact quantity of paint necessary could not be calculated, it was decided to have a large tin of black varnish paint—this was required to cover the whole surface of each plate; and a small tin each of enamel paint, white, red and yellow.

Taking these as the main items of expenditure and making inquiries in the market, it was estimated that the total cost of the scheme might amount to a little more than Rs. 4. The actual expenditure is shown at the end of the article. It will be seen that the latter does not differ much from the former.

All articles, main and sundry, as shown by the list given below, were now kept ready and the work began. The tinsplate was cut into the requisite sizes by a local tinsmith and the large name-plate for the school was framed with wood by a carpenter. The painting

process which now followed was easy. Each plate was first given a black wash. When this dried, the required words were drawn on it in pencil in block capitals. This pencil work was then filled in with white paint, the shade of the letters being coloured orange—a mixture of yellow and red—with a dash of red in the corners. A final thin wash of varnish to cover the paint and prevent cracks therein later on completed the work and made the plates ready for fixing on the door frames. The fixing, too, was done by the boys. Small brass nails were used for this purpose, the reason being their immunity from rusting and the consequent ease with which they can be detached. The name-plate for the school was hung by zinc wire in a prominent position on the school front.

The total actual cost of the project is shown by the following list :

					Rs.	A.	P.
Four tinplates, each 2 ft. x 2 ft.	...	...	...	...	1	0	0
Carriage for the above	...	...	...	...	0	2	0
Black varnish paint, big tin	...	...	...	...	0	8	0
Enamel paint, three tins...	...	...	...	...	1	2	0
Tinsmith's cutting charges	...	...	...	...	0	4	6
Carpenter's charges for wooden frame	...	...	...	...	1	0	0
Big painting brushes, two	...	...	...	...	0	5	0
Turpentine to mix with the paints	...	...	...	...	0	1	0
Kerosene and soap for washing hands	...	...	...	...	0	0	9
Varnish...	...	...	...	...	0	2	0
Brass nails and zinc wire	...	...	...	...	0	1	3
					<hr/>		
				Total Rs.	4	10	6

It was a matter for some legitimate pride to the students and the school that the expenditure was considerably less than the quotation of the local painter, which was Rs. 10, while the work done is not a tittle less satisfactory than the professional in quality.

Will it be too much to hope that this short account may serve to encourage other schools to carry out similar projects ?

A. D. KULKARNY

CORRESPONDENCE

Contracted Method of Division

Sir—No apology seems to be needed for writing a letter on the contracted method of division after Mr. L. R. Desai's article¹: for he has left room for it by saying that there are various methods of teaching Contracted Division. Since most of the mathematical rules or principles were discovered by induction, the inductive method seems to be the most eligible for their exposition. It not only gives students full scope to exercise their own reasoning powers in the discovery of the rule, but also enables them to deduce it from known principles, if it happens to be forgotten after a long lapse of time.

Before proceeding with the method, I feel inclined to say a few words about Mr. L. R. Desai's 'Standard Form' as well as his rule for Contracted Division. He strongly advocates the former for determining the number of figures in the integral part (if any) of the quotient or that of the ciphers (if any) after the decimal point in the quotient, when the quotient contains no integral part. It is however not quite comprehensive. For example, the 'standard form' of $8\cdot573 \div 87$ is according to him, $85\cdot73 \div 8\cdot7$, and 85 divided by 8 gives two figures to the integral part of the quotient, which, in fact, should contain only one. Similarly the 'standard form', $08573 \div 8\cdot7$, may give one cipher instead of two after the decimal point if we restrict our attention to the unit's place of the divisor. The obvious defect of this 'standard form' is that by restricting the attention to the unit's place of the divisor it fails to be applicable if any succeeding significant figure in the divisor be greater than the corresponding figure in the dividend, all the figures to their left being equal each to each. Some other standard form, more comprehensive, is therefore needed. To my mind it seems such a one can be had by reducing the divisor to a whole number and making corresponding changes in the dividend. It is this standard form that is generally used in ordinary division and there is no need to depart from it in contracted division.

Secondly, Mr. L. R. Desai's rule for contracted division requires modification in accordance with the 'Note' he has found it necessary to add at the end; for, as it stands, it cannot give one more place than the required number of significant figures in the quotient.

Now let me turn to the inductive method of teaching Contracted Division. As this method proceeds step by step from the known to the

¹ TEACHING, Vol. IV, No. 2.

unknown, I shall only indicate below, first, what the pupils about to learn the contracted method are expected to know, and then the several steps by which they may find the unknown.

I. KNOWN

1. The ordinary long process of division, necessitating the use of the standard form with the divisor reduced to a whole number.

2. The necessity of working out the quotient to one more than the required number of places of decimals.

3. The idea of significant figures as well as the determination of their number in the quotient when the latter is required to be correct to a certain number of decimal places.

4. The approximation rule.

(*Note.*—The idea that the remainder after each step in the division is multiplied by 10, i.e. is reduced to the next lower denomination, when the next remaining figure in the dividend is brought down, seems to be implicit in the minds of students. It deserves to be made explicit at this stage at least. Some practice may also be given in the determination of the number of significant figures in the quotient.)

Below is worked out an example in division by the ordinary method:

$12\cdot5013456 \div 1\cdot25423$, correct to two decimal places.

$$\frac{12\cdot5013456}{1\cdot25423} = \frac{1250134\cdot56}{125423} \text{ (reduced to the standard form).}$$

$$\begin{array}{r} 1254 \ 23) \ 12501 \ 34\cdot560 \ (9\cdot967 \\ \underline{11288} \ 07 \\ \ 1213 \ 27\cdot5 \\ \ \underline{1128} \ 80\cdot7 \\ \ 84 \ 46\cdot86 \\ \ \underline{75} \ 25\cdot38 \\ \ 9 \ 21\cdot480 \\ \ \underline{8} \ 77\cdot961 \\ \ 43\cdot519 \end{array}$$

The required quotient = 9·97, correct to two places of decimals.

II. STEPS

1. The last remainder shows that the quotient will not be much affected if the last few places (*viz.* 34·56 in the above) in the dividend are ignored.

2. The remainder after each step in the division is multiplied by 10, so that the divisor may divide into it. Since¹

$$\frac{R \times 10}{D} = R + \frac{D}{10}$$

¹ R = Remainder, D = Divisor

instead of the remainder being multiplied by 10, the divisor may be divided by the same: i.e. instead of a figure being added to the former, a figure (extreme right) of the latter may be rejected, and the nearest ten obtained by multiplying the rejected figure by the partial quotient carried.

3. Since the divisor goes on losing a figure after each step, the quotient can have as many figures as there are figures in the divisor before the latter loses its last (the extreme left). This makes it clear that in the divisor only as many figures (from left to right) need be retained as the number of significant figures (i.e. one more than the number required by the example) we have to find out in the quotient.

(*Note.*—The superfluous figures in the division above may be shown by drawing a vertical line.)

4. Since it is the number of significant figures and not of decimal places in the quotient that determines the number of figures to be retained in the divisor, it becomes necessary to determine it before proceeding with the contracted division. The standard form with the divisor reduced to a whole number helps to determine the same.

If some typical examples (including one in which the number of significant figures in the divisor is less than that required to be retained in it) are worked out, students will not find any difficulty in formulating the rule given below.

III. UNKNOWN (RULE)

1. Determine, with the help of the standard form, the number of figures in the integral part (if any) or the number of ciphers (if any) after the decimal point when the quotient is without the integral part. Hence determine the number of significant figures required in the quotient.

2. Retain one more significant figure in the divisor and take the first step, carrying the nearest ten obtained from the product of the partial quotient and the rejected figure (i.e. the one next to the retained places) in the divisor. Cross out the figures remaining in the dividend after the first step is taken. (If the number of significant figures in the divisor is less than that required to be retained in it, the defect may be made up by adding ciphers.)

3. At each succeeding step, go on rejecting a figure in the divisor, carrying as above. State the quotient correct to the required number of places with the decimal point in the proper position.

K. S. DESAI

OBJECTIVE TESTS. V

Arithmetic Tests

THE accompanying test is intended to survey in their several variations the fundamental processes which are included in the portion generally covered in the Fourth A.-V. Standard. It is intended to test speed as well as accuracy, so only 30 minutes should be allowed for the whole test. It is, of course, objective, but can scarcely be called 'new-type', except that each example aims to test a slightly different ability from any other and altogether they aim to test the whole syllabus, excluding problems. By giving this test a little before the annual examination the teacher will discover the weak spots which need revision.

In marking answers the first five examples should be allowed two marks each and the rest should be allowed three. One mark should be deducted for failure to reduce answers to lowest terms. The percentage for passing the test should be 60, or perhaps higher, as a high degree of accuracy in fundamental mechanical operations should be insisted upon.

(Note.—For a good discussion of the theory underlying this test see P. B. Ballard, *The New Examiner*.)

IV Standard. Arithmetic Test.

Name

Do all the work on this paper. Work quickly but carefully, as there are only 30 minutes. If any example is too hard, leave it and do the next.

- | | | |
|-----------------------|--------------------------------------------------|------------------------------------|
| (1) $3 + 8 + 17 =$ | (8) $388 + 8 =$ | (15) $16 + \frac{2}{3} =$ |
| (2) $111 - 102 =$ | (9) $17 \times 19 =$ | (16) $\frac{2}{3} + \frac{2}{3} =$ |
| (3) $6 + 9 - 4 + 8 =$ | (10) $\frac{1}{2} + \frac{1}{3} =$ | (17) $1.5 + .65 + .25 =$ |
| (4) $200 - 7 - 181 =$ | (11) $\frac{1}{3} + \frac{1}{2} + \frac{2}{3} =$ | (18) $3 - .025 - .25 =$ |
| (5) $1 + 1 =$ | (12) $\frac{7}{10} - \frac{1}{3} =$ | (19) $12 \times 0.25 =$ |
| (6) $256 \times 8 =$ | (13) $\frac{2}{3} \times \frac{2}{3} =$ | (20) 5% of 40 = |
| (7) $38 \times 12 =$ | (14) $1\frac{1}{3} \times 4\frac{1}{2} =$ | (21) $4 : 6 :: 10 : ?$ |

(22) Add

967
602
75
461
740

(23) Add

Rs.	A.	P.
1	8	6
0	7	8
4	0	11
0	15	9

(24) Add

Yds.	Ft.	In.
1	2	$3\frac{1}{2}$
1	2	$2\frac{1}{3}$
		$11\frac{2}{3}$
1	5	$\frac{1}{3}$

(25) Add

110.
6.04
92.7
85.5
36.44

OBJECTIVE TESTS

(26) Multiply
Hrs. Min. Sec.
3 13 8
× 9

(27) Multiply
As. P.
6 8
× $5\frac{1}{2}$

(28) Multiply
79·4
× 31·6

(29) Multiply
90·64
× ·015

(30) Subtract
Rs. A. P.
2,063 4 8
907 14 5

(31) Subtract
65·63
44·68

(32) Subtract
Yds. Ft. In.
16 0 3
6 1 $4\frac{1}{2}$

(33) Divide
28)9704

(34) Divide
·09)641·7

(35) Divide
5)Rs. 8-10-9

F. S. WILDER

REVIEWS

MESSRS. MACMILLAN & Co. point out that in the review of R. H. Whitehouse's *Assignments in Geography*, which appeared in the last number, our reviewer incorrectly stated that the book upon which the assignments are based was not written specially for Indian students. The assignments are actually based on A. C. Morrison's *Our World—A Human Geography* which was written specially for use in Indian schools. We much regret the mistake.

Some New Books on the History of Education

History of Secondary Education. A Study in the Development of Liberal Education. I. L. KANDEL, M.A., PH.D. Pp. 597. George G. Harrap & Co. Ltd., 10s. 6d. 1931.

The Growth of Freedom in Education. A Critical Interpretation of some Historical Views. W. J. MCCALLISTER, M.A., PH.D., B.Sc. Pp. 602. Constable & Co. Ltd., 30s. 1931.

A History of Educational Thought. PERCIVAL R. COLE, M.A. Pp. 328. Oxford University Press, 10s. 1931.

It is a pity that the History of Education is sadly neglected in many training colleges in India. As an instrument of culture its value can hardly be over-estimated, and it also has a distinct professional value to the teacher. No one need feel ashamed of profiting by a study of the educational writings of Plato or Locke, or of learning from the mistakes of Rousseau, Pestalozzi, or even Montessori. It is, therefore, refreshing to notice that Professor Cole, in his recent *History of Educational Thought* boldly asserts that 'one can scarcely study the history of education, without becoming a better teacher'. His own contribution to the subject, however, is not an ideal book for teachers under training, although it can be read with profit, not to mention enjoyment, by those who are already familiar with this important branch of educational literature. In the first place, the division into five sections, each approximately the same length, seems rather artificial; and, secondly, in each section the space allotted to different thinkers is badly distributed. For instance, in Book I (Greek Period) Socrates and Plato together are given only four pages, and the treatment is rather sketchy. In Book II (Roman Period) Quintilian is allowed three pages, while Ausonius is given seven and Capella nine pages; this allotment seems to be altogether out of proportion to their relative importance. (No one except the expert, or the research student, need bother his head

about either Ausonius or Capella.) Passing on to the Middle Ages (Book III), a few pages are devoted to a discussion of the 'Irish Educational Tradition', which in many standard works gets no more than a passing reference, and there is also a chapter on the 'Vision of Dante', which is interesting, but of no great importance. In this section there is an excellent account of the 'Rise of Universities', one of the best chapters in the book. Book IV (Renaissance) might easily have been reduced to half its present length, while Book V (Modern Times) would not have suffered by expansion. The latter includes an entertaining, but not very relevant, chapter on 'Anatole France on Childhood', and the volume ends with a critical examination of 'British and American Paths to Culture'. The book is notable in that it contains a mass of useful information which is not easily accessible elsewhere within the covers of a single volume. But, in spite of Professor Cole's enthusiasm and scholarship, it is not likely to prove useful to those for whom it was primarily intended. As a reference book, however, it can be strongly recommended, because the statement and criticism of the doctrines of the great educators is accurate and concise, and the volume contains very full bibliographies.

Professor Kandel's *History of Secondary Education* covers, in part, the same ground, but is written on an entirely different plan and is much more narrow in scope. Part I traces the growth of Secondary education from the time of the ancient Greeks up to the eighteenth century, and Part II gives an account of the Secondary school systems of France, Germany, England and the United States during the last hundred years. Part I merely gives a setting or background for Part II, which is wholly admirable. Indeed, it is hard to think of a book which within such a brief compass gives a better account from an educational point of view of the national systems of four of the most advanced countries of the world. Further, the story is carried down to 1930 and the sections which deal with the educational reforms which followed the Great War are among the best in a very informative book. The volume is based on a course of lectures delivered to students at the Teachers' College, Columbia University, and deserves to be studied by educational reformers and teachers under training. The chapter on the United States is the best short account we have seen of the Secondary school system of that progressive country, and the chapter on the education of girls can hardly fail to appeal to Indian readers. Professor Kandel bears his learning lightly, writes clearly and to the point, and is fair and unbiassed in his judgments. The Appendix contains not merely useful bibliographical lists, but a number of thought-provoking questions which will enhance the value of an excellent book for students, lecturers and (possibly) examiners.

The last book on our list—Professor McCallister's *Growth of Freedom in Education*—is an attempt to interpret in the light of present-day knowledge the most important historical views on a subject which bristles with difficulties and has given rise to considerable difference of opinion. One often hears people (including teachers) talk glibly about the 'freedom of the child', a subject about which very few have any clear conception. When one studies the doctrines of modern thinkers and educational experts, one cannot help being struck by the divergent views which prevail. Let the reader analyse and compare the views of, let us say, Mr. Bernard Shaw and Mr. Bertrand (now Lord) Russell, of Freud and Montessori, and he will soon realize the divergence of opinion which exists and, incidentally perhaps, the haziness of his own ideas. Professor McCallister has done a great service by publishing his historical study of the development of the concept of freedom and his penetrating philosophical analysis of the doctrines of the educational thinkers from Plato down to Dr. Dewey and Sir Percy Nunn. His book is by no means easy reading and is not likely to appeal to the general public nor to ordinary practising teachers. It is, however, a very solid contribution to educational theory and must be regarded as one of the most notable books published in 1931. To attempt to trace the course of the argument would be impossible within the limits at our disposal. It is sufficient to point out that about two-thirds of the book are devoted to the period since Rousseau and that the examination of the views held by present-day thinkers on the everlasting problem of freedom is accurate and stimulating. Professor McCallister's final adjustment of the freedom of the child and the authority of the teacher is worked out convincingly and points the way to a new and better educative process. This book calls for a strenuous effort on the part of the reader, but those who are fitted to make the effort will be amply rewarded in knowledge and inspiration. Finally, the price may seem to many to be excessive but, in the opinion of the present writer, this exceptionally well-reasoned and well-planned book is worth every penny of the thirty shillings which the publishers demand.

* * * * *

Suggestions for Primary School Teachers. H. DIPPIE, M.A., D.S.O. Pp. 228. Oxford University Press, Rs. 2-8. 1931.

Many books have been published giving advice to that most unfortunate of all teachers (the Indian Primary school teacher) on the art of performing that most impossible of all tasks (the conduct of an Indian Primary school). In reading most of such books one feels a great longing to put the author of all that good advice into a Primary

school, and watch him attempting to carry it out. Here, at last, is a book written about the Primary school by a man who really knows what he is talking about and whose advice is not a pious hope as to what *should* be done, but a statement of what actually has been done.

It is essentially a practical book. It supplies a statement of practicable ideals towards which the Primary school teacher may reasonably be expected to strive.

What is so particularly pleasing about the book is that, although it is so definitely practicable, there runs through it a golden vein of sensible idealism which cannot fail to be inspiring to all who read it. It begins: 'As an Indian school teacher you have a position unrivalled for opportunities of serving your country': it goes on to show how this statement may be made real, how village education may really be related to village life.

The chapter on discipline is particularly pleasing. It recognizes the fact that the Primary teacher has usually two classes to deal with simultaneously; and it stresses the value of a right type of discipline in quickening intelligence and developing individuality.

In the chapter on School Organization there is an excellent suggestion in regard to the adaptation of school hours and holidays to suit the convenience of village life.

Mr. Dippie has done some important experiments in the teaching of reading in the vernacular. Some of the results are here indicated, although we should like to see (at some time) a more formal report. Those who have realized the futility of the old alphabetical method of teaching reading have often been led to the conclusion that a pure 'Look and Say' method is the necessary alternative. There is little question of the rightness of the 'Look and Say' method in the case of an unphonetic language like English. But it is very questionable whether a pure 'Look and Say' method is justifiable in the case of a phonetic alphabet. The best method of teaching an unphonetic language is now fairly definitely established; but strangely enough, the far easier problem of teaching the reading of a phonetic language is far less fully explored; and Mr. Dippie's pioneer work in this connexion is likely to be of considerable interest and value.

There is only one point on which one feels inclined to differ from the author, and that is on the subject of Drawing—which he treats as a compulsory subject. Is it possible to teach in the Primary school sufficient Drawing to be really worth while? What difference should there be between the Drawing syllabus intended for the child who has no natural aptitude, and that intended for the child who has? Syllabuses in Drawing are usually framed by artists, and they tend to assume artistic ability in the children who study them—an assumption which is

correct in not more than 20 per cent of the cases. We have yet to learn what should be the syllabus for the person who will never draw well—what is the necessary minimum of Drawing without which he would be handicapped in life.

This is a book certainly which ought to be in the hands of every inspecting officer, and of everyone engaged in the training of Primary teachers. What is more important is that it should also be translated into the vernaculars in order to reach the teachers themselves.

* * * * *

The Teaching of Elementary Mathematics. C. GODFREY and A. W. SIDONS. Pp. 322. Cambridge University Press, 6s. 6d. 1931.

Here is a book that would be of great value in the teaching of Mathematics in Primary and Secondary schools in India. The various topics have been dealt with in a masterly manner. Though one may not feel confident to follow all the methods advocated by the authors, the suggestions given are extremely helpful. One hears the ring of a practical teacher's voice in every chapter, and a teacher, however efficient he may be in methods, is helped in this book to a solution of the difficulties he comes across in his daily work. Many of the knotty problems encountered in ordinary class-work are very effectively solved, and without any hesitation one can recommend the book to every teacher of Mathematics.

The ideas developed in Part I, though academical, are very instructive. Part II deals with general teaching points which should prove very helpful to a Mathematics teacher, whether experienced or a beginner in the profession. In Part III, the author discusses the topics in Arithmetic in detail, but not so exhaustively as to tire out one's patience. The same is the case with topics in Algebra, which find a place in Part IV. Teachers using *Elementary Algebra* by the same authors will find the suggestions very instructive. Coming to Part V, one finds the treatment of Geometry very lucid. A teacher, despite the recommendations of the Mathematical Association, as laid down in their report on the teaching of Geometry, is at sea as to how to develop the subject in its initial stages. The authors have tried to solve this difficulty by outlining precisely and exactly the work to be gone through term after term. It is not their intention that the order of topics be followed rigidly, but one certainly feels oneself relieved as regards that handling of the subject after going through this portion once.

Good as the book is we feel its value would be considerably enhanced if it were printed on smoother paper. We recommend this book to all teachers of mathematics whether old or young.

Seatwork. A. B. H. J. RUSTOMJEE, M.A. Pp. xii + 84. Oxford University Press, As. 12. 1931.

Seatwork is intended to be an aid to reading. It is meant for use during the Reading period while the teacher is correcting individual mistakes. While a poor reader is performing, what are the other boys doing? As the author suggests in her preface, they pretend to listen but they don't attend 'if they are healthy uncowed human boys'. Is this not the experience of us all? We have tried some of these exercises in the second standard. We are using the *West Readers* and we have found *Seatwork* rather similar to West's *New Method Composition*, though more varied and stimulating than the latter. It had a decidedly good effect upon the class interest. Our boys had some trouble with words like *draper, florist, volcano, crayon, easel, proportion*, etc., which had to be explained; but this has only enriched their vocabulary.

The exercises that boys like most are those of finding antonyms and synonyms and those of guessing riddles. All these exercises are based on the best type of Intelligence Tests, and the words are those in very practical, everyday use in the life of the boys. The teacher can frame an indefinite number of such exercises from his text on the same model. The book has been very useful to us, both for its material and for its indirect suggestions as to methods of teaching Reading, and so we are sure that it will be very helpful to teachers and students throughout India.

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