

groups that are not tens, into groups of ten. If six groups of nine are given us we regroup the nines into tens, find that the result is necessarily five groups of ten and four over, and that, consequently, six nines are fifty-four,—a fact recorded in the multiplication table. From a clear perception of the purpose the true method of teaching the multiplication table will emerge. The teacher must teach the pupil how to do the regrouping rapidly for himself; he should not call upon his pupils merely to remember the results of the regrouping, should not simply expect his pupils to learn by heart the multiplication table.

The twice table is learned incidentally in learning to add. Addition, step by step, is the grouping into tens of two given numbers, then of the result and another number, and so on. Among the mental additions to which the pupils of good teachers have been accustomed, such questions will have been solved as what are seven and seven, sometimes stated as two sevens and later as twice seven. The twice table, therefore, presents no difficulty. The tens table has really been learned in learning numeration. The numbers given are already grouped into tens. No regrouping is required. All that is necessary is to recall the slightly modified names of the collected groups; thus forty represents four tens.

The next table to take is five times, because fives are easily arranged into tens. First discuss the even fives; thus four fives equal two tens which are twenty, and so on, up to eight fives are four tens, are forty. Next dis-

cuss the odd fives, three fives are ten and five, are fifteen, up to nine fives or five nines, forty-five.

As a group of nine is easily made up into a group of ten by the addition of one to it, nine times is the next easy table to understand. Take three nines thus: Make up two of the nines into tens by adding to each one taken from the third group of nine, leaving of that third nine seven, so that three nines or nine threes are two tens and seven, that is twenty-seven. So proceed upward to nine nines are eighty-one, carefully stating every product in both the direct and the inverse order, thus eight nines must be sometimes asked for as nine eights. Nine times may also be made to lean upon ten times thus: seven tens are seventy, but seven nines are seven less than seven tens, therefore, seven nines or nine sevens are seven less than seventy, that is they are sixty-three. Both ways of looking at nine times should be practised, for skill in numbers largely results from a certain nimbleness of mind in taking quickly many views of the combinations possible among the numbers presented; and although I cannot now occupy the space necessary to exhibit the various ways in which products may be presented, it is to be understood that I strongly recommend a varied presentation.

It is not quite certain in what order the remaining columns of the table should be taken, but I incline to take eight times next. Each eight is made up into ten by adding two. Three eights then will make two tens and leave four over, that is they are twenty-four. Similarly four eights are thirty-