CORRESPONDENCE

To the Editor of the *Mathematical Gazette*

DEAR SIR,

In the Gazette No. 345 Miss Burslem writes of the difficulties children have in understanding Subtraction. This is not surprising. The fact is that those who have to teach subtraction do not know the meaning of the term. How then can they cause other than confusion in the minds of their pupils. The reason for this is partly because they are not mathematicians and partly because of the vicious circle of their having been taught incorrectly. Unfortunately, mathematicians who do not have to teach the subject have not bothered to give it the attention which is so urgently needed.

What then is the meaning of Subtraction? Simply this. We are given the sum of two quantities and one of them and we have to find the other. In other words, Subtraction is just an aspect of Addition. The phrase "Take away" is an artificiality which blinds us to the true meaning of things. It is obviously a deliberate invention of the devil to produce muddled thinking in the teacher and confusion in the minds of his pupils. The phrase "Take away" should be abolished and even the word Subtraction should not be used in the hearing of a pupil under the age of 15 by which time it is powerless to do any harm.

Millions of shop assistants and others who have to do subtractions turn the process into one of addition. To them the process seems perfectly natural and obvious. Many of them were dunces at school and got their subtractions wrong; now they always get them right.

This is how a subtraction should be arranged. Suppose that the sum of two numbers is 74 and one of them is 39; we have to find the other number. Put 74 where it ought to go, namely as the sum. Put the 39 as the first of the numbers to be added and leave a blank for the second number; this is our answer. The arrangement so far is,

39

—

74

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Now add. (There should be some prior practice in adding downwards which is just as easy as adding upwards.) The process is 9 and *5* (put it down) are 14. Put down 4 (it is already down) and carry 1. 1 and 3 are 4 and *3* (put it down) are 7. The answer is *35*. If the answer is entered in red as is sometimes done in balancing an account this would add excitement and interest which are advantages I need not enlarge upon. However, this is not essential.

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Incidentally, the answer is placed where it always appears whe costing an account.

Of course, I am describing the method very briefly and I am nc dealing with the gradual build-up which is needed in young childre One advantage of the method is that no new set of basic facts hav to be mastered. At present, the pupil has to learn a set of bas facts for Subtraction as well as one for Addition. This unnecessar burden adds to his difficulties; no wonder he is so bothered.

Credit is due to Miss Burslem for her attempt to grapple with th problem. The searcher after truth has often to do more than or experiment and make a fresh start. I suggest that Miss Bursle starts again along the lines which I have indicated and—what important—reports on her progress.

One last word. In the Association's Report on the Teaching Arithmetic (page 18) the method recommended is that of Compl mentary Addition. And here are some of the names of the Committe which made this recommendation. F. C. Boon, C. T. Daltr W. Hope Jones, A. Robson, A. W. Siddons, C. O. Tuckey, R. W Wright, R. V. H. Roseveare, W. C. Fletcher—names to conju with (they include four past Presidents of the Association). Is not time we took their teaching to heart?

125 *Jersey Rd., Osterley.* Yours etc., S. INMA

THE SCIENCE OF MECHANICS

To the Editor of the *Mathematical Gazette*

DEAR SIR,

In the October 1959 number of the Gazette there was an artic with the above title. A sub-committee of the Teaching committe is now at work revising the report on the Teaching of Mechani in Schools. We are at present working for this report along th lines suggested in the article.

In stage A we shall include topics of mechanics which can b introduced into the ordinary elementary course of mathematics i all schools, and which can serve to illustrate elementary metho and broaden the scope of examples.

In stage B we shall give the main course of mechanics and w hope that most schools may manage to start this, at any rate wit better pupils, before examinations at "O" level are taken.

Stage C will suggest a course suitable for mathematical specialist which can demonstrate the logical development of the subject fro the assumptions laid down by Newton, and thus prepare studen for the study of other fundamental assumptions, and the develo ment which follows.

Yours etc., K. S. SNEI

(*Chairman of the Mechanics Sub-committe*