In some cases the pupils studying arithmetic, algebra or practical mathematics, are drilled during a certain portion of each day by the teacher; but no definite lesson being regularly assigned for preparation, no attention whatever is given to the work by a majority of the class, except during the recitation period. In this manner the studious may make progress; but there is no pressure whatever on the careless and indolent.

I will briefly indicate what has proved itself to be the *right mode* of teaching arithmetic and mathematics generally. The pupils should be properly classified; and after they have thoroughly mastered the fundamental rules, a definite portion of work should be assigned for each day, to be prepared by the period for recitation. *During the recitation the pupils should explain, not the teacher.* Of course, difficulties will be met which he should ultimately lessen or make clear, as may be necessary, but only after the pupils have studied and puzzled over them for themselves. The rules for working, which in every text-book should be expressed in the most concise, and explained in the clearest possible manner, ought to be committed to memory; and the explanations and reasons should be so carefully studied that they be promptly given when required. If the teacher gives lessons of reasonable length, and insists on their being thoroughly learned, the pupils will assuredly be more active than they would had they no assigned work to do. Some teachers make it a point to spend twenty minutes or half an hour in explaining the principle of every new rule, before the pupils have carefully examined it for themselves. Such a course is subversive of one of the highest ends of all school training, viz.,—teaching the pupil to study and investigate for himself. The committing and the explaining of the reason of a rule is sufficient for a single lesson, the number of questions given at each subsequent lesson must vary according to their difficulty and the capacity of the pupils. The slate work in the preparation of lessons can generally speaking, be more conveniently attended to in the school-room than at home. At recitation, each pupil, beside answering questions as to the rule and the general scope of the lesson, should be required to work and explain at least one problem on the blackboard, of which latter there should be from two hundred to three hundred square feet in every school-room. At every stage of the explanation the teacher and the members of the class may interpose questions as to the reasons of the operations. One such exercise will do more toward strengthening the mental powers of the pupil than "cipherıng" over a page merely for the purpose of obtaining the answers. It does more than merely give him a knowledge of the questions and rules. It imparts to him confidence in speaking in the presence of others: it trains his organs of speech, enabling him, nay, obliging him, to speak distinctly; it gives him a compass of language, and accustoms him to clothe his thoughts and ideas in his own words while on his feet—an accomplishment of the highest value.

Algebra should be studied the same as arithmetic. It is often thought that pupils should master some advanced work in arithmetic before they commence algebra. This, I think, is a great mistake. They do not begin algebra soon enough. They should be introduced at an early stage of study to generalities instead of having their attention so long directed to particulars in a thousand different phases. The prevalent impression that general truths as opposed to the particular, are more difficult to comprehend than the latter, is erroneous. One general proposition is more readily remembered than a hundred particular applications of it taken separately; but by remembering it the applications arrange themselves in the mind with scarcely any conscious mental effort. Many of the text-books on algebra now in use are unsuitable for beginners. An easy work like Bridge's, in which practical questions in reference to familiar objects, such as coins, apples, marbles, &c., are introduced at the beginning, after each of the fundamental rules, and at every stage of progress, would be much more interesting and instructive to the pupils, and would give him a clearer insight into the reasons of arithmetical rules, than any work treating merely of arithmetic. The most difficult rules in arithmetic, and the most absurd ones too, such as Position and Allegation, vanish on the application of the simplest algebraic principles.

Two or three propositions can be taken in advance every lesson in geometry. No books should be allowed in the class. The teacher should give a different proposition to each student, as in arithmetic and algebra, thus constantly reviewing. After all the figures have been constructed with letters different from those in the book, the members of the class should be called up in turn to explain. When one fails, it is the height of folly for the teacher to demonstrate the proposition himself. It is not at all probable that he can make the matter any clearer than it is in the book. In nine-tenths of the cases of failure in lessons, the reason is not to be found in the pupil's want of ability to understand, but in his want of industrious application. Two or three cases of failure at the blackboard in the presence of the class or the school, will generally go far toward bringing the most lethargic to his senses and rousing him to exertion.

I have found that a large class in any of the branches of which I have spoken, can work on the board and explain within the time generally allotted for recitation.

I would not be understood as wishing to abandon the use of the slate at recitation. Far from it: circumstances may render it impossible to carry out fully the system I speak of; for very small children slates only will suit, and in any case they can frequently be used with every advantage.

The remarks I have made in reference to the mathematical branches, with some modifications will apply with equal force to nearly all the studies pursued in the school. For example, after ordinary reading lessons the questions as to the subject of the lesson in too many instances embrace a large number of words, while the answers are merely "Yes, sir," "No, sir," "He did," "He was." This is often the case, too, with classes in geography, history, chemistry and philosophy. The teacher should spare no effort to encourage the pupils to use their own language at recitation. A little painstaking in this particular will produce astonishing results. The little boy or little girl who at first seems too diffident to venture a single sentence not in the book, soon begins almost unconsciously to allow the tongue to tell of the newly found mental treasure. The study of Collier's British History in this manner, the pupils being required to give in their own language the particulars of reigns, epochs, &c., would be more conducive to mental discipline, command of language, correctness of expression, and substantial knowledge, than the mere reading of Hallam or Macaulay, and a half hour lecture on history every day.

The system of recitation of which I have spoken, is required for training efficient teachers. Many whose attainments are respectable, bungle sadly in making subjects plain for their pupils. The reason is obvious. It cannot be expected that men and women can concisely and clearly explain difficulties for others, if they have not been carefully trained in that particular themselves.

The gross violations of grammatical rules, the feebleness and vagueness so often observable in the conversation and public speaking of many learned men, can to a great extent be attributed to the very defects in teaching at which I have hinted. For that boy must either be a very sluggard or a confirmed blockhead, who fails to form the habit of speaking correctly after being required during all the years of his school life to clothe his ideas in a proper grammatical garb.

Opportunity is afforded every day, at a properly conducted recitation, for practising correct speaking. The teacher should always correct grammatical inaccuracies. Of course he can do it in a delicate manner.

Teachers on almost every subject explain too much; pupils, too little. If half the effort that is now put forth in the school-room to find out for the pupil, were made in clearing the way for the pupil to find out for himself, the cause of education would gain infinitely by it. There is too much *pouring in*, not enough *drawing out*; too much of treating the mind as if it were a vast reservoir, and the object of education was to fill it in the shortest possible time; too much of working for the pupil instead of encouraging him to fight bravely and gain conquests for himself.

I do not mean that the teacher should always be silent and never dilate on any subject. It is his to strengthen and encourage the weak and diffident, and make knowledge attractive to all. At the *proper time* he should illustrate and explain. Occasions will continually present themselves, when he can use his power of description and analysis with clearness, force, and even eloquence.

The school being a miniature world, the pupil's work should be that of a man and a citizen on a miniature scale. Life's work is an uphill race. He who does not press forward persistently himself, will soon be pushed back in the rear, where he will seldom find any one kind enough to take him on his back and carry him along. Then we cannot begin too early to teach the young habits of self-reliance. By making their way all clear in the school, we really unfit them for the graver difficulties and duties which lie in the pathway of all.

NUMBER.

A COURSE OF LESSONS PREPARATORY TO THE USE OF A TEXT-BOOK ON ARITHMETIC.

V.

THIRD STEP.—*(Continued.)*

MULTIPLICATION.

THERE are people who do not consider either Multiplication or Division as a distinct operation, or as one involving a new principle, since, philosophically considered, these two operations of arithmetic can but do one of two things—either *increase* or *diminish*—which was done equally by the two processes already described. Moreover, multiplication, as everybody knows, is undoubtedly the result of the *addition* of equal numbers. When these results have been committed to memory, so that they can be immediately reproduced, we give to this act the name of *multiplication*. All being agreed that the instantaneous production of the facts of multiplication are of the utmost importance, in the arithmetical transactions of practical life, the question remains whether they have simply to be committed to memory, without thought or reflection, or whether they ought to be found or produced by the pupils themselves. The first view led to the mechanical learning by rote of the so-called table of multiplication; the second view arose from the conviction, that it is unworthy of the most logical of