As writing is a species of drawing, and the teaching of drawing is said to be 'educating the eye to observe and the hand to execute with correctness and gracefulness,' and writing being a branch of instruction in form, the instruction in both may proceed *pari passu* for some distance.

ARITHMETIC.

The conception of *numerical value* and *operation* should be first awakened. Number the pupil early observes, and small operations in it are familiar. Rules may be given at first. The teacher shows him numbers on the ball-frame differing one from the other, and by this means children get ideas relative to value. We take numbers the learner is acquainted with, increase or decrease them, and thus infer *operation*. Concrete number alone to be used at first: the pupil is not yet able to abstract number from things. He knows what four marbles are but cannot reason about the number four. He must be carried to the abstract through the concrete.

NUMERATION.—With numeration, addition and substraction are connected. We add one each time to reckon upwards, and subtract one to reckon downwards. This is called counting, and after it is learned up to a hundred we may begin to add two numbers together, keeping the added number constant, as, 2 and 2, 3 and 2, 4 and 2; or the receiving number constant, as, 2 and 2, 2 and 3, 2 and 4, &c.; then the adding of more than two numbers; then the adding of tens and tens, and tens and units. Subtraction may be taken in two ways: by varying the minuend and keeping the subtrahend constant, as, 2 from 3, 2 from 4, 2 from 5; or from 10 take 1, 10 take 2, &c.

MULTICATION is best illustrated by addition, first taking small numbers, the multiplier being constant; then with the multiplicand constant. The multiplication table is thus gradually comitted to memory. In division, keep divisor constant and proceed by numbers which give no remainder: afterwards with those giving remainders. The four fundamental operations may be thus illustrated in a very elementary way, and afterwards questions given involving them. For these purposes the ball-frame is quite sufficient, taking care that the eyes of the class follow the manipulations.

The standard measure or tables were generally the most uninteresting 'tasks' of early school years, chiefly for this reason, that abstract matter was too soon presented to the scholar, not illustrated by concrete examples. Instead of being so, they can be made most inviting. Three things have to be learned; the value of the units of measurement; their relation to each other; and their application to practical purposes. He learns the first by showing him the real weights and measures and making him handle them. The second he learns by comparing the units one with the other. The third by actual measurements of the objects about him in the school-room. The teacher can have all the weights and measures of the country among his apparatus. The committal of tables to memory will now be a work of little difficulty.

Arithmetic is one of those branches which has a distinct value in the business of life, apart from that which it has in an educative sense. Though the immediate object of its being taught is the former, it may also be made a process of mental cultivation. The teaching of this branch can be carried on with two objects in view; for practical skill, and to strengthen the mental powers. Theory and practice must be combined. The principle on which arithmetic should be taught, appears to be, to infer theory from practice. The teacher gives the pupils examples within their experience and leads them to see what operations are required, and then evolves the general procedure. The four primary rules arise out of the relation of numbers as expressed by our notation. Addition and subtraction directly, multiplication and division indirectly. Combinations of these rules solve all problems. First principles in all cases determine each step. Applied questions may be introduced from the beginning, carefully graduated.

Notation and Numeration may be taught together. The first difficulty to a child is the number 10. In speaking of the first nine numbers it is better to call them two-units, three-units, &c. The numbers being afterwards applied elliptically to various groups may create confusion. The use of the cypher may now be explained as distinguishing between the 1 from unity and the 1 from ten. The number 100 is treated as 10 was. The next difficulty is 101, which the child thinks is 10 and 1. The cypher here used for keeping figures in their relative position is explained The pupil may be exercised in finding out pages in a book, and to write down numbers when shown them on the ball-frame. When children have learned to read and write so far as a hundred, the further extension of notation and numeration is easy. The following short rule for notation I have found most successful. *Three* figures follow thousands, *six* figures follow millions. This shows at once that three places go to thousands. It is seldom necessary to go beyond millions for practical purposes. I have found after teaching notation as far as a hundred, this short rule produce good teaching results. The importance of numeration and notation may be assumed, when we consider, "that all numerical operations whatever have their basis in the system of numeration which is assumed, and cannot be understood even in the slightest degree, without a clear perception of the principles of that system."

ADDITION is first thougth from the conerete; thus, John has 37 marbles, James 36, and Peter 44; how many have they all? This cannot be added by one step as small numbers can. It must be added by successive steps, and then the partial results combined. The rule may be stated with reference to the steps of the operation, and then committed to memory.

SUBTRACTION.—The same explanation and gradation apply. The addition of an axiom is necessary to explain the 'carrying' process. 'The difference of two numbers is not altered if both are equally increased.' Illustrated thus; John is 6d. richer than James, he has still as much richer if both get a penny additional. The illustration from money is a good one; we must change a shilling, when we take away 4d., suppose, and have no coppers; a pound is changed when we want silver to give away. The principles on which these two rules depend are: 'when we add a series of numbers the sum should be the same in whatever order we add them,' and 'what we take away from a thing and what is left of it make up the whole thing.' Mental practice should be continued simultaneously with the written, for the sake of facility. Some recommend compound addition and subtraction with the simple rules, because of the interest which money sums have for children.

MULTIPLICATION, which is a short-hand process of addition, is illustrated by that rule. The multiplication table is the basis of both multiplication and division. Perceptive illustration from ball-frame will show what is meant by "times" or "number of times." Multiply first by the units in succession; then by the tens in succession; then by such a number as 46. The product by 4 must be explained by showing that is it 40 you are multiplying by.

DIVISION table, which is the reverse of multiplication table, has been already learned. Short division is the same as long, one being an elliptical form of the other. Long division explains short, and should be taken before it with easy numbers. In long division the system of 'trial and error' may be followed, as in the example, 9128 divided by 29; two into 9 goes four times and 1 over, will 9 go into 11 four times? No. It is then seen to be contained 3 times. Beginners lose time with experimental quotients.

REDUCTION—The pupil can construct tables for himself, from his knowledge acquired by actual examination of the standards of weights and measures used in the school. He is called on to state why he multiplies by 20 in reducing pounds to shillings; the answer to which is 'because there are 20s. in a pound we