

human growth. *It is the one great factor to aid in the study of these central subjects.*

"Education is life." Is it life to have the children read such stories as the following: "There is a man. The man is lame. The man has a cane and a dog," etc., when the whole universe is full of genuine truths in which the child is interested. What we need in our schools is a type-writer or small printing press, by the aid of which we can make, and have the children make, our own reading matter based as it should be on these "central subjects." Let us ask them, too, for a more liberal supply of supplementary readers; *i. e.*

Brooks and Brook Basins—*Frye*.
Seven Little Sisters—*June Andrews*.
Each and All. " "
Ten Boys. " "
The Nine Worlds.
Stories of Old Greece—*Finch*.
Hiawatha.
Robinson Crusoe.
Grimm's Fairy Tales.
Harper's Young People.

Let us give the children something of *real educative value* to read; and let them read, *read*, READ, and we'll *never*—and I emphasize the *never*—have poor spellers. Spelling is such an absolute waste of time. Again I quote from Dr. Dewey: "The children love permanently what is best for them." They love reading; *i. e.* good reading. They love this study of the "central subjects" of which our talk has been. In fact, if we would only present the conditions and allow the children to do their own studying, we would have children who delighted in the very name—"school." We would not have tired, care-worn faces; for the glory and thankfulness that we were among those privileged to be teachers would shine about us and make the whole world better.

In conclusion let me say a few words about expression. How do children express themselves? Through gesture, voice, speech, music, making, modelling, painting, drawing and writing. If in the study of these central subjects all the modes of expression are continually and skilfully used to *intensify thought*, every child would acquire proficiency in modelling, painting and drawing.

Let us then, comrades in the teaching profession, throw off some of our old methods and follow the words of the "Great Teacher" who said: "A little child shall lead them." Let us say with Froebel: "Come let us live with the children." Let them show us what they love to study and let us *help* and not *hinder* them in that study, remembering always that "what the child loves best, will best develop him."

Defects in Teaching Arithmetic.

Wherein are the methods employed in teaching arithmetic in this country defective? Under this head I cannot do much more than enumerate the principal defects.

1. Too much of the teaching, particularly in the lower grades, is in the abstract instead of the concrete. The fundamental principles of arithmetic should be developed and illustrated by groups of objects, by joining lines, by dividing them into parts, etc. A pupil can divide an apple into parts more easily than he can master definitions, and when this is done he has a conception of fractions which he can not gain in any other way. A pint cup, a quart cup, and a gallon bucket will make the table of liquid measure interesting to the children. ~~If~~ a teacher will provide herself with a collection of blank bank checks, drafts, and notes she will wake up her class in banking and exchange.

2. The study of arithmetic is mainly memoriter work. Properly taught it should stimulate thought. There is a volume of truth in the following: A grocer asked his son to tell him what $12\frac{1}{2}$ pounds of turkey would cost at 8 cents a pound. After fumbling about and covering two or three sheets of paper with figures, the boy said "Father, I never had any turkey rule."

3. In nearly all teaching the answer and not the principle is the end sought. The children are given a rule for doing sums and then examined to see if by that rule they can do a specified number of sums. The better way is to (1) explain the principle, (2) let the pupil solve the problem, first orally then on his slate, and (3) then require him to make his own rule.

4. Not nearly enough attention is given to securing rapidity and correctness of work. The pupils are not taught methods of checking or testing their work without repeating it. This is the point the writer had in mind in his remarks before the Illinois Society of Engineers, which provoked this discussion.

5. Too much attention is paid to the printed problems. The simple operations of arithmetic can be better exemplified by problems set on the spur of the moment and springing naturally from the environment of teacher and pupil, than by those given in a printed book; and have the inestimable advantage of exciting the interest of the pupil.

6. The books give too many examples under the rules and not enough miscellaneous problems.

7. Many of the examples are logical puzzles which only confuse and bewilder the pupil. The answers are obtained only by an ingenious process of guessing.

8. The different divisions of the subject are kept too much separated. For example: When a boy com-