equation of fractions, solve a quadratic equation, plot the graph of an equation, etc., as a test of their ability to state in good English the way to get results. Our students learn a certain rigmarole which kills the true spirit needed in any mathematical endeavor. Teaching mathematics by rigmarole is the easy way. It develops no power in people for clear, concise thinking. This kind of teaching makes pupils as well as the general public opponents of our high school mathematics.

Teachers of mathematics need to realize that their problem is a very hard one. They need to give thought to it. More concentrated effort in our teaching will lead to better results, will remove many of the objections lodged against the science into whose rooms every student should look, many of whom will want to enter and contribute to its development.

THE DICTIONARY OF GEOMETRY.

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The dictionary of geometry is sadly neglected both by teachers and pupils. It should not be. One can hardly learn to write if the dictionary of the language that he speaks is neglected. One can hardly be expected to think intelligently in geometry if the fundamental truths (the dictionary) are not clearly understood.

A page of definitions or rules is more or less uninteresting reading for the average pupil. There is little to create or promote a lively interest there. And yet, no pages in the text need emphasis more than these. They are the dictionary of the subject.

Proofs or theorems occupy, and rightly so, a most important place in the study of the subject of geometry. A proof, if it be complete, requires statements of fact for which reasons must be given. There is always a "why" to be answered. A proof without reason, is worthless. Correct reasoning depends very largely upon a sound and broad knowledge of the geometrical dictionary.

"The radius perpendicular to a chord bisects it and the arc which it subtends." Here is a short theorem but even here, in spite of the brevity of it, several definitions must be understood if the proof is to be worked out successfully. What is a radius? What is the meaning of perpendicular? What is the meaning of chord? To bisect a chord is to do what to it? What now, does that word "subtends" indicate? Always there is an oppor-

tunity to test one's knowledge of the geometrical dictionary

A good place—in fact, the best place—to start the geometrical ball rolling is in the last two years of the grammar grades (the first two years of the junior high school). Children of the age represented here can visualize and understand the construction of such things as squares, rectangles, triangles, circles, tangents, etc. They can also understand and become proficient in applying the formulas that are used for finding the areas and perimeters of these common figures. To do this at this time is opening the pages of the geometrical dictionary to them. They will enjoy the new knowledge acquired and later on they will profit greatly by it.

It is true, of course, that all of this work will have to be reviewed at a later period but if the foundation is built at a time when the mind is more receptive and keen to learn than is perhaps the truth later on, the review will be easier and of greater value.

There are many ways in which to learn the dictionary of geometry, depending very largely on the way that the subject is taught. Here is a chance to make a teaching problem an interesting one.

The geometrical terms should not be learned as one might learn a poem. No laborious and tiresome memory work should be necessary in the sense generally thought of. Let there always be an illustration at hand. If a rectangle is a plane figure bounded by four sides all the angles of which are right angles, let there be a cardboard figure to illustrate. Children absorb much visually. Let the eye see the definition. The right angles should be pointed out; the fact that one side is longer than the other should be indicated. Explain why this figure is called a rectangle.

Where areas are to be found and perimeters determined there ought to be a definite illustration to tie the mental thought and the visual thought together. The young student is slowly but surely learning his geometrical dictionary.

It is a practical impossibility to teach geometry successfully if the illustrations are neglected. A geometry class room without a blackboard in it is a good way from being ideal. One of the most important and necessary features of such a room would have been neglected if such an aid to teaching were missing. The teacher should use a lot of chalk when teaching rules and definitions. Illustrations are needed if the geometrical dictionary is to be mastered.