A Case of Miscommunication
The final version of the National Council of Teachers of Mathematics' Standards is now available. Everybody Counts (from the National Research Council's Mathematics Science Education Board) was published earlier this year. The first report from the American Association for the Advancement of Science Project 2061 supports the positions taken in the other two reports. More studies have appeared depicting how bad mathematics education is in this country.

Responses to these reports appear, at first blush, to be classic instances of the unhygienic process of putting words in other people's mouths. On closer examination, however, a case of massive miscommunication becomes apparent. This is both ironic and distressing, since one of the major recommendations of the professional groups is to improve communication about mathematics. We may first have to improve communication about mathematics education.

In my October 1988 column I said the Standards suggest "all children can (and should) study algebra, geometry, statistics, probability, and other exciting topics even if they have not yet become proficient in the usual pencil-and-paper algorithms for doing arithmetic." In the March 1989 "Letters" feature of this journal, I was accused of saying the writers of the Standards want to "make all students take courses in abstract algebra, geometry, and 'other exciting topics'."

To me, the two statements are worlds apart. They may seem identical, though, to somebody who survived (or failed to survive) the strange and dreary traditional United States mathematics curriculum, with separate courses in arithmetic ad nauseam, algebra, geometry, and more algebra. The pointless manipulation of meaningless symbols, the artificial compartmentalization of the naturally coherent and beautiful subject of mathematics, and an apparent desire to eliminate all realistic applications from the mathematics classroom have, over
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how to formulate a problem in mathematical terms and how to go about solving it. Most important, perhaps, they must learn to communicate with others about their solutions. I see these as the important points of the recommendations made by various professional mathematics education groups over the past 15 years.

Fortunately, help is available for individual teachers and school systems who wish to teach mathematics that is exciting and challenging and that encourages all the skills, including communication, that are being proposed. For example, Scott, Foresman and Company has just published three books (for grades 7, 8, and 10) from the University of Chicago School Mathematics Project. The others (for grades 9, 11, and 12) are available in preliminary form from the Project and will be published by Scott, Foresman in the next few years (see illustration). Elementary school textbooks that help a teacher do these things have been available from other sources for some time.

But teachers, textbook committees, and others tend to reject textbooks that look different. "This isn't an algebra book—it has geometry and statistics in it too." "Is this a reading book or a mathematics book?" "Do they actually expect children to discuss mathematics with each other?" "You can't expect children to write actual English sentences in mathematics class."

We can, and we must. Critics of the recent reports on mathematics are right when they say that more of the same dreary stuff they call mathematics will probably do more harm than good. But they are wrong when they say that because most adults don't use much mathematics, therefore, future adults shouldn't learn more and better mathematics than their parents. Most people would lead better lives—and make greater contributions to their own and the world's welfare—if they understood more mathematics and if they understood it better. As the world becomes even more complex and technological, this will be true of ever more people.

We cannot afford to keep our children from learning better or more mathematics than we learned. We must change, and we must change now. The acceptance of the Chicago mathematics materials, and other materials like them, will indicate whether this nation has the will to improve, or just the urge to view with alarm."

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