

Throw Away That Science Book!

"Errant Texts" and "Where's the Book?" by Janet Raloff, in *Science News* (Mar. 17 & 24, 2001), 1719 N St., N.W., Washington, D.C. 20036.

*Don't know much about history,
Don't know much biology.
Don't know much about a science book,
Don't know much about the French I took.*

Those memorable lines from Sam Cooke's "Wonderful World," that golden oldie from 1960, could well be the anthem of American students today, to judge from the grades they regularly get on international tests in science and math. U.S. fourth graders did poorly in 1996, and four years later, as eighth graders, they did even worse, trailing their counterparts in 17 other countries. Ironically, a big part of the problem may be that very science book they don't know much about.

A recent study of the dozen physical-science textbooks most widely used in American middle-school classrooms found them riddled with errors, reports Raloff, a senior editor at *Science News*. Reviewers, led by John L. Hubisz, a physicist at North Carolina State University in Raleigh, compiled a list of mistakes 500 pages long. "Diagrams often did not display what the text or caption indicated," Raloff says. "Sometimes a book asked questions that were impossible to answer—either because it offered too little information (for example, the values for two dimensions when the student needed to compute volume) or because explanations necessary to solve a problem wouldn't appear for another couple [of] pages or even chapters." Scientific principles were often depicted or defined incorrectly.

But errors of fact are just part of the problem. Summarizing a 1999 study of 10 texts sponsored by the American Association for the

Advancement of Science, project director George Nelson says, "Even if the science had been 100 percent accurate, students still wouldn't learn from these books, because the instruction [in them] was inadequate." Often, legions of facts were crammed into the texts, with little to connect them.

The middle-school textbooks are typically put together by an editor working with contributions from contract writers who often have little control over the final product. And the results are less likely than high school and college science textbooks to be vetted by professional scientists.

One exception to the dismal rule, Raloff found, is *Introductory Physical Science* (1999, seventh rev. ed.), written by a team of scientists and science teachers, and warmly praised by textbook critics. Originally brought out by Prentice Hall in 1967, the book "briefly became a top selection for eighth- and ninth-grade classrooms," Raloff says. Since the early 1990s, it's been published by co-author Uri Haber-Schaim's firm, Science Curriculum. But the book doesn't sell well enough to have made Hubisz's study of the top dozen.

Some science educators want to get rid of the middle-school textbooks entirely, says Raloff. Larry Malone, a curriculum developer at the University of California's Lawrence Hall of Science in Berkeley, and others favor having students learn scientific principles and methods of analysis by working together on investigations of hypothetical oil spills, epidemics, and the like. Students, they hope, would then be singing a different song.

Enlightened Architecture

"X-Ray Architecture" by Ken Shulman, in *Metropolis* (Apr. 2001), 61 W. 23rd St., New York, N.Y. 10010.

For four years, Bill Price, a lecturer in the University of Houston College of Architecture, has been working on an invention that could be architecture's next cool thing, dramatically changing the way buildings (and other things) look and function: translucent concrete.

Price's quest began when he was director of research and development for the Office of Metropolitan Architecture, the Rotterdam firm of avant-garde architect Rem Koolhaas. "Could we make the concrete translucent?" Koolhaas asked at a meeting about a concert hall