

Book Report

A major share of this month's issue of *The Physics Teacher* is devoted to a review of high-school physics texts. This review was commissioned and supported by The David and Lucile Packard Foundation as part of their continued interest in science education.

We started out with problems of choice. Which texts should we review and who should review them? Information about text sales is considered proprietary by most publishers. Some new books were still in the production stage. Furthermore, many high-school classes, particularly Advanced Placement classes, use college texts. As for the review panel, we needed both high-school and university physics teachers. For establishing rules of procedure and for discussion of viewpoints, we needed people who could meet regularly and easily, but to avoid parochialism we needed broad representation across the country.

Our resolution of these problems led us to choose seven texts for review, spanning a wide spectrum of styles from traditional to innovative. We chose seven teachers who live within driving range of the State University of New York (SUNY) at Stony Brook. Four teach in high schools; three teach in the university. We also appointed an external group with members scattered across the country. Two teach in high schools; five teach in universities. All, however, have extensive experience in dealing with high-school physics. The names and affiliations of the reviewers are listed on page 296.

The actual textbooks are only part of the teaching system offered by

O thou monster ignorance, how deformed thou dost look.

Sir, he hath not fed of the dainties that are bred in a book; he hath not eat paper, as it were; He hath not drunk ink, his intellect is not replenished...

William Shakespeare,
Love's Labour's Lost, act IV, scene 2

most publishers. There are also available lab books, teacher's guides, transparencies, and computer programs. We did not attempt to examine all this ancillary material, but we saw some evidence that the extra features had not been as well refereed as the main texts.

We did not all agree on all topics! The spectrum of texts and the spectrum of teachers produced a spectrum of opinions. To the extent that there is any consensus, it is fair to say that the texts have fewer physics mistakes than most of us expected. Indeed, a couple were almost beyond reproach in this regard. We did not intend to recommend any one text for all situations. In the detailed description of each text, we suggest the type of audience and circumstance for which it might be appropriate.

The seven texts reviewed may be categorized as follows. The most sophisticated, in terms of rigor of treatment and accuracy of presentation, is surely *PSSC Physics*. The most encyclopedic coverage is to be found in the new Holt book. It follows the traditional sequence of topics, as do Heath and Glencoe. The math and reading level expected for Holt is slightly above that of Heath or Glencoe. *Physic-AL* is in a class by itself, with nonstandard sequence and treatment. It requires lab work matched to the text. *Conceptual Physics* has been refined through many editions. It is still more appropriate for a preliminary course or for situations where students do not have to face an external exam in the standard topics (such as the SAT or New York State Regents exam). This is even more the case with the new and

very different course called *Active Physics*, which is designed for students who will not be taking a standard physics course. There is no way to compare these texts in terms of one being "better" than another. Each is designed for a different audience with different goals.

Our report consists of three main parts. First we provide a factual description of each text, along with a commentary about its special features and problems. Each of these descriptions was prepared by one of the local group, with input and feedback from everyone else, both local and external.

The second part of the report lists some of the mistakes found in one or more of the texts. Our aim here is not to point fingers of shame (the offending texts are not identified), but to provide a tutorial on common mistakes that we all make in teaching physics. This is a tutorial for us, physics teachers at all levels, and not for our students.

The third part of the review comes from reports of all the reviewers concerning the use of texts in high schools. Are they used by students? How? Are they read? Should teachers insist that students read? Are textbooks obsolete?

Perhaps some readers will not agree with some of our evaluations or items in the tutorial that we classified as mistakes. Join the panel; let us know!

The last time we reviewed high-school texts in *The Physics Teacher* was November 1982. Extrapolating, we can expect the next review in 2016. But will there be texts then?

Cliff Swartz