

Beware! Innovative Textbook Ahead!

The Story of Science: Einstein Adds a New Dimension, by Joy Hakim, Smithsonian Books, Washington and New York (2007), 468 pp. \$27.95 hardback.

With the many problems present in modern textbooks, it is always pleasant to find one that attempts to change the status quo both by breaking existing rules and establishing new ones. This third installment in Joy Hakim's *The Story of Science* series is just such a book. Published in association with the National Science Teachers Association, it is essentially a textbook on modern physics, but unlike most existing textbooks, this one is actually a joy to read. Like its companion volumes, it is less than \$30 and published with beautiful hardbound covers and a dust jacket.

In 49 chapters, Hakim covers everything from Einstein's childhood musings to Maxwell's electromagnetic unification, particle physics, chemistry, atomic structure, Einstein's seminal papers, nuclear physics, general relativity, gravitational waves, quantum electrodynamics, field theory, cosmology, and even string theory (or is it string hypothesis?). Surprisingly, the intended audience is not college or university undergraduates but rather middle school science students! Therein lies the special appeal of Hakim's *The Story of Science* series. All three installments are aimed at middle school science

courses with teachers who want to do away with traditional textbooks and their inherent errors and inadequacies. Hakim concentrates on both the process of science and the many interesting historical vignettes and just plain fun stories that came out of this process specifically from the 20th century, a period of time that some textbooks scarcely acknowledge as having occurred. Each chapter is bite-sized and can easily be read in less than an hour, although readers will be pleasantly sidetracked by the color illustrations, diagrams, photographs, and historical notes, where real learning can happen. As a textbook, one would expect to find equations, worked examples of problems, and end-of-chapter problems or exercises. Hakim includes none of these, and this is to the book's and reader's advantage. Students are actually forced to read the text rather than flip through the pages searching for just the right formula into which they plug some numbers to get an answer to a sanitized textbook physics problem. Hakim has taken the time to express the physics and its history with words rather than equations, and this is remarkable nowadays. She got it right too, which is also remarkable nowadays considering the errors in many existing textbooks.

I can just imagine the resistance to using this book from students, administrators, and teachers. All three must accept that textbooks must evolve and, hopefully, improve. To do so requires abandoning our traditional concept of a textbook

in favor of newer models. As with computer user interfaces, the user is often the biggest obstacle in the way of change, demanding it but simultaneously rejecting anything that is different or new or challenging. If assigning a chapter for reading and a subset of homework problems from the end of that chapter is your way of teaching physics, this book is not for you. If you would have students memorize equations rather than understand what those equations mean, this book is not for you. If you are satisfied with having lesson plans done for you by publishers rather than creating your own, this book is not for you. If you are a creative and innovative middle school science teacher and determined to do better by your students, then this is the physics book for you.

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MicroReview by the Book Review Editor

• *Quantum Questions: Mystical Writings of the World's Greatest Physicists* Revised Edition, edited by Ken Wilber and published by Shambhala, Boston, MA, 02115, pp. xii+225 (2001), \$14.95, paperback.

Religion and mystical writings are not quite the same, but, nevertheless, the author brings up an interesting argument for seeing science and religion as two viable modes for investigating reality.

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