

throughout the world—violence that could suddenly escalate to a nuclear confrontation, as it has all too often threatened to do in the past.

Kull brilliantly dissects what we call the “weaponitis” of nuclear policymakers. But he fails to extend his critique to the weaponitis exhibited by many of the policymakers’ critics. Still, *Minds At War* is one of the most original and important works in the vast nuclear literature. All serious students of Armageddon should read it.

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A Tour of Computers

Ideas and Information. Managing in a High-Tech World. ARNO PENZIAS. Norton, New York, 1989. 224 pp. \$17.95.

Arno Penzias, vice-president for research at AT&T Bell Labs, Nobel prizewinner for measuring the temperature of the universe, and serious amateur sculptor, has written a book full of “ideas and information,” but don’t let the subtitle fool you. This is not a book about technology management. “Coping in a High-Tech World” might have served a little bit better. It’s a book about how it all works, written for people who don’t already know.

In essence, Penzias takes us on a leisurely tour of the world of computers. He takes plenty of time along the way to tell us why Napoleon lost at Trafalgar, why there are 60 seconds in a minute and 60 minutes in an hour, and how to analyze a balky automobile engine. He points out that, just as the telegraph ended the brief if glorious day of the pony express, the fax is likely to do the same for the Federal Express. He even tells us about his disappointment upon learning that a part he was ordering from a catalogue couldn’t be shipped until the next week, in spite of a promise in the catalogue of same-day service. “You must have a very old catalogue,” he was told, without a trace of irony, “Now we have a computer.”

Nevertheless, this is a book about computers. We learn how a transistor works, how an integrated circuit chip is fabricated, how formal logic works, and how simple circuits can perform logic operations, and so on, through binary numbers, registers, compilers, and all the rest. The tour is anything but pedantic and orderly. We start with the catalogue clerk and get to the transistor somewhere in the middle of the book. But it is comprehensive. Penzias’s goal seems to be

to tell his reader, not in detail but in broad general principles, what computers are about and what they’re likely to be good for.

Penzias has the born teacher’s knack of simplicity. It serves him well in describing the transistor as a cheese sandwich, but the reader starts to get vaguely uneasy when he applies the same principle to historical events. For example, he tells us that the telegraph was invented by Samuel F. B. Morse, with help from William Sturgeon and Joseph Henry, who had discovered how to make an electromagnet. I think the story is considerably more complicated, involving Oersted and Ampère, Gauss and Weber, and Cooke and Wheatstone among many others. But then again, the transistor is also more complicated than a cheese sandwich. If simplifying technology is a virtue, why should simplifying history be a vice?

This is not a book for experts or high-brow critics. It is the view of an intelligent, knowledgeable, and fluent observer, watching and describing a historic revolution, from a privileged vantage point, written in a way that nearly anyone can understand.

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Some Other Books of Interest

Science Off the Pedestal. Social Perspectives on Science and Technology. DARYL E. CHUBIN and ELLEN W. CHU. Wadsworth, Belmont, CA 1989. xii, 196 pp. Paper, \$17.75.

Courses in what the editors describe as “the multidiscipline of science, technology, and society,” or STS, are now taught on a number of campuses, and this collection of readings is intended to aid both students and instructors in such courses in the effort “to take science off the pedestal on which modern culture has deposited it, to dig into problematic issues, and to be skeptical of pat solutions of untested assumptions.” The emphasis of the collection is, as the subtitle suggests, on the impact of science on society rather than on its internal workings. Examples used are mostly relatively recent, rather than historical, episodes, and many contributions expound conclusions drawn as much from the authors’ own work as from comprehensive literature surveys. In part 1, Science, Technology, and Other Social Institutions, James C. Petersen and Gerald Markle discuss controversies involving science and technology (biomedical issues in particular), Ron Westrum discusses the handling of anomalous or implausible phenomena (“hidden events”), and Rae Goodell and

Sheila Jasanoff respectively discuss the relations of science with the press and with the legal system. Part 2 of the book, entitled World Views and the Politics of Knowledge, opens with an overview of the discipline of sociology of science by Sal Restivo. Further papers consider the use of citation analysis (Susan E. Cozzens), scientific communication as related to national security (Thomas F. Gieryn), research malpractice (Chubin), and the implications of biotechnology (Markle and Stanley S. Robin). In part 3, Science and Technology as Public Resources, Edwin Mansfield presents an economist’s view of research and development, Arie Rip discusses the issue of technological determinism, Edward J. Woodhouse considers problems of political judgment in the face of scientific uncertainty, Michael S. Brown discusses issues pertaining to occupational health and safety, and Stephen P. Turner explores the differences between scientific knowledge and the kind of knowledge involved in making policy decisions. Each paper and group of papers in the volume is preceded by an introduction by the editors, who also add a brief “postscript,” an appendix listing “STS resources,” and a glossary defining a sampling of terms used in the book.—K.L.

Einstein Simplified. Cartoons on Science. SIDNEY HARRIS. Rutgers University Press, New Brunswick, NJ, 1989. Unpag. Paper, \$9.95.

The word “simplified” seems to have passed out of favor for titles of works of popular science, and its parody in the cartoon appearing on the cover of this collection ought to put a definitive end to its use. The cartoon consists of three portraits of the famous scientist progressing from a full panoply of hair, mustache, and wrinkles to a few barely recognizable strokes of the pen. Inside the book are some 170 more of Harris’s cartoons, reprinted from periodicals scientific and otherwise. Some of the cartoons utilize well-worked themes (the equation-laden blackboard, evolutionary progression, Newton with apples), and a few (Boole ordering lunch) are on the arcane side. Though some on modern historical themes don’t go beyond what contemporary cartoonists were able to do with the themes (Röntgen shining a light through his wife), others add a new twist (M. Pasteur being introduced to a colleague in milk improvement, M. Homogen). Among those dealing with present-day themes, genetic engineering and elementary particles are frequent targets, as are such extra-laboratory phenomena as food additives and computers. Some of the pithiest of the cartoons, to this browser, are those dealing with less-than-