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cially since its meat can provide food and its ivory can be sold on the black market.

Bonner admires Zimbabwe's solution to the dilemma. There, tourist dollars generated by interest in wildlife "correlate as closely as possible with where the wildlife is." This provides local people with an incentive to protect animals; elsewhere, such funds go into national treasuries, from which they rarely filter down to the rural populations.



George Schaller, a noted naturalist, finds similar circumstances threatening the giant panda. The panda exists in the wild only in remote sections of China, but the combined pressures of poaching (a panda pelt fetches more than \$10,000 on the black market, while a live bear can bring more than 10 times that amount) and diminished habitat have reduced its numbers to fewer than 1,000.

In recent years, political and economic realities have all but ended panda research, and while provisional plans exist to set aside preserves, no real action has occurred. The declining numbers of wild pandas has forced Beijing to abandon the practice of sealing diplomatic relations with gifts of breeding pairs. (Hence the arrival in 1972 of Ling-Ling, since deceased, and Hsing-Hsing to Washington's National Zoo.) They have in fact come up with an alternative practice that Schaller finds more disturbing: lending out bears for limited-term zoo exhibition in return for cash. Conservation officials feel the practice puts undue stress on the remaining pandas and reduces the likelihood of their producing new cubs in captivity, and they have pressured the Chinese government to reconsider it.

How best to save the giant panda? Schaller's

conclusions are remarkably similar to Bonner's: The "effort must involve local people, based on their interests, skills, self-reliance, and traditions, and it must initiate programs that offer them spiritual and economic benefits." Conservation, he adds, "cannot be imposed from above."

**NUCLEAR RENEWAL: Common Sense About Energy.** By Richard Rhodes. *Whittle Books in association with Viking Publications.* 127 pp. \$17.50

Author of the prize-winning saga *The Making of the Atomic Bomb* (1986), Richard Rhodes here looks at the peacetime fallout from that endeavor: nuclear power's current problems and future promise. Today about 100 nuclear plants operate in the United States, more than in any other country, but far fewer than the thousands once predicted for an era of electricity that would be "too cheap to meter."

Rhodes blames nuclear power's "present impasse" on contentious political control by federal and state authorities and unrealistic economic decisions that priced atomic-generated electricity out of the market. "The truth," writes Rhodes, "is that nuclear power was killed, not by its enemies, but by its friends." These friends included greedy manufacturers and contractors who escalated plant size (and costs) for elusive "economies of scale," federal regulators who ignored the financial consequences of their rules, utility executives and rate commissioners who gladly passed rising expenses on to consumers, and members of Congress who pampered the infant nuclear industry with the 1957 Price-Anderson Act, which indemnified utilities from liability for their nuclear accidents.

But while Rhodes explains nuclear power's problems astutely, his account of its promise is misplaced. For example, he hopes to solve today's political and economic problems with a technical solution: the integral fast reactor (IFR). This sodium-cooled nuclear power plant is a beguiling "breeder" reactor of the 1950s, once touted for making extra plutonium fuel but now—in a still unproven metamorphosis—also expected to consume plutonium from other reactors. Rhodes says the IFR will dispel political opposition because it is safer than today's water-

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cooled reactors and will ease economic pressures by burning some nuclear wastes. But besides being overly optimistic, Rhodes minimizes potential problems with high-level radioactive waste disposal and scants the dangers of the IFR's sodium coolant, which can burn in air or explode in water.

Rhodes is right to praise the Japanese and the French for centralizing and simplifying their nuclear-power programs. Their accomplishments stand in marked contrast to jurisdictional confusions that have hampered U.S. development. But such praise ignores how differently the French, Japanese, and American political and economic systems work. He also glides through some conjectural risk-benefit statistics for different energy sources and activities, concluding that coal burning, driving small cars, and taking birth control pills are all more dangerous than running nuclear plants—without conceding just how controversial such calculations still are.

In the end, this little book is persuasive but not convincing. Rhodes pleads for "leadership and public education" to beget safer reactor designs and to boost political support for nuclear power. But because the nuclear enterprise must be so tightly controlled, the real challenge still lies with reforming the United States's wobbly federal-state regulatory system. To duck the fundamental problem only invites new grief from nuclear power's next generation of "friends."

**SCIENCE AND ANTI-SCIENCE.** By Gerald Holton. Harvard. 203 pp. \$24.95

Václav Havel is not a creationist, but in *Disturbing the Peace* (1990) the Czech president-playwright voiced a sentiment shared by the creationists: that the decline of traditional religion has left a hole in the fabric of Western civilization that science cannot fill. It seems odd to speak of Havel and the creationists in the same breath. To Gerald Holton, a professor of physics and the history of science at Harvard University, it is both natural and important to do so. If modernity is defined by the culturally dominant posi-

tion of science, we should not be surprised if the premodern and nascent postmodern make common cause to bring science down. Yet Holton thinks scientists by and large *are* surprised, and inadequately alarmed.

The largely disconnected pieces in this volume are given some coherence by the last essay, "The Anti-Science Phenomenon," which explores the nature, sources, and motivations of the disparate forces in Western society opposed to a scientific worldview. Holton assigns the skeptics to four categories: philosophers who view science as a social myth and seek to "abolish the distinction between science and fiction," disaffected intellectuals who feel left behind by the dizzying rate of modern scientific discovery, "New Age" thinkers who believe that "one of the worst sins of modern thought is the concept of objectively reachable data," and a group that worries that modern science is "the projection of Oedipal obsessions."

Appropriately, Holton is most concerned with how easily antiscience forces can be manipulated by political concerns. The Nazis exploited Germany's alternative science movement for the horrific policy of "race purification." The Soviet Union imposed Lysenkoism—the notion that acquired characteristics can be inherited—on its scientific community. Scientists initially regarded Lysenkoism as a passing fad, but the theory reigned for several decades, with disastrous consequences for the practice of science in the Soviet Union. Today, right-wing activists such as Jimmy Swaggart and Pat Robertson espouse antievolutionism as "part of an attack on secular humanism," which they see as an element of a "Satanic ideology."

Holton reviews past and potential future strategies for defending science, but offers no panaceas beyond eternal vigilance. Nor does he argue explicitly that it *is* within science's power to influence what does ultimately fill the void left by religion. His broad erudition and synthetic intellect help define the problem, but solutions, as Havel would say, are beyond the scope of science.