
O'Neill, U.S. industry may lose its edge in such fields as microengineering, private aircraft construction, space transportation, and genetic engineering. Long-range production planning and "abundant internal capital," for example, may soon enable Japan to dominate what specialists see as the most lucrative potential use of genetic engineering—the making of commodity chemicals and synthetic fuels. O'Neill balances his warnings with applause for those American industries, such as IBM and the "Silicon Valley" firms that have been technologically innovative *and* shrewd in long-range planning and financing. He also provides what most economists and business analysts cannot: clear, authoritative explanations of the scientific principles involved in various advanced technologies. With O'Neill's help, even nonscientists can understand how dynamic magnetic levitation (maglev) may one day make magnetic "flight"—with vehicles traveling in a vacuum at speeds of up to 1,200 miles per hour—a safe and efficient form of human transportation.

**THE COEVOLUTION OF
CLIMATE AND LIFE**

by Stephen H. Schneider
and Randi Londer
Sierra Club, 1984
576 pp. \$25

In March 1975, Senator William Proxmire (D.-Wis.) publicly ridiculed the National Science Foundation for investing \$112,000 in a study of the African climate during the Ice Age. This book makes the argument that such historical studies are anything but frivolous. Schneider, a climatologist at the National Center for Atmospheric Research, and Londer, a science writer, contend that taking the long view of climate yields information that Americans would do well not to ignore: Interglacial periods last from 10,000 to 12,000 years, and our current period has lasted 10,000 years already; worldwide droughts have occurred about every 22 years since 1700, making the next round due in the mid-1990s. The authors explain how everything from archaeological finds to sunspot cycles to computer models helps climatologists to predict likely future climatic "actions" and the probability of biological catastrophes.

Some climate changes defy forecasting. Both air pollution and rising temperatures resulting from the release of carbon dioxide have altered climate so quickly that prediction has become almost impossible. Even so, to prevent, or at least to prepare for, such weather-related disasters as Ireland's great famine (1845–50), governments and international agencies should take climatic models into consideration when they formulate agricultural, industrial, and energy policies. Schneider and Londer acknowledge that the crystal ball that such models provide is still dim and "dirty," but they wonder how long "we should clean the glass before acting on what we see inside."

**NOT IN OUR GENES:
Biology, Ideology,
and Human Nature**
by R. C. Lewontin,
Steven Rose,
and Leon J. Kamin
Pantheon, 1984
322 pp. \$21.95

Biological determinists are those scientists who see the causes of social and individual behavior in human genes. They are also, the authors of this book insist, bad guys. Professors Lewontin, Rose, and Kamin—a Harvard geneticist, a neurobiologist at England's Open University, and a Princeton psychologist, respectively—mix analysis with polemic to argue that the determinists practice not only bad science but also unhealthy (i.e., reactionary bourgeois) politics. The authors are more persuasive when they discuss science: They explain, for instance, how the sociobiologists, led by Harvard's E. O. Wilson, have narrowed Darwin's sense of the gene-environment relationship; Darwin believed evolution was influenced by chance as well as by "optimal adaptation." Classic determinist studies of twins designed to prove the heritability of behavioral traits are, the authors contend, invalid on several counts: biased observers, inadequate sampling, and faulty reporting procedures. When the authors press their political case—that biological determinists have helped others to justify social inequalities—they transform a partial truth into a blunderbuss of generalization.