

ordering of society ("the hidden agenda of modernity")—is hardly new. Toulmin is more original in locating that rationalist philosophy in its time and in demonstrating, through the limitations of his own book, how difficult it is to free oneself of its hold.

Modernity, in Toulmin's view, began when 17th-century thinkers began to substitute for heavenly truths secular certainty: To overcome the ideological warring in a perpetually crisis-ridden Europe, philosophers such as Descartes, Newton, and Hobbes renounced all human ambiguities and envisioned a human society that would be rationally ordered. Descartes and Hobbes are usually discussed without reference to the preceding Renaissance philosophy, but Toulmin shows just whom they were writing *against*. Descartes's epistemology, with its clear, uniform distinctions between subject and object, was written specifically to refute the revival of classical skepticism in such writers as Montaigne.

If *Cosmopolis* has a hero, it is clearly Montaigne. Montaigne (1533–92) talks about himself, recounts his moods and his sexual experiences, admits his ignorance, and abjures all systems. Descartes (1596–1650), by contrast, demands absolute certainty, assumes the model for all knowledge is mathematics, and separates the controlling mind from controllable nature. The Cartesian quest for certainty has, over three centuries, invariably favored the written over the oral, the universal over the particular, the general over the local, and the timeless over the time-bound. In trying to realize the Cartesian agenda, modernity got on the wrong track by not taking into account the infinite variety of human experience. Toulmin's prescription for our overreaching rational control, and the one-sided modernity it has created, is a return to that humane, cautious, tolerant skepticism that he finds in Montaigne and generalizes to all the Renaissance humanists.

Toulmin's essay reflects so much of the recent critique of Western culture that it is a bit of a surprise to realize at the end how completely he remains within the intellectual framework he condemns. His argument lacks humility, omits all thinkers (e.g., Spinoza, Hume) who would force him to qualify; Toulmin is himself systematic and generalizing, too often dispensing with the taste for particu-

lars he admires in the earlier humanists. He thus discusses modernity without a single reference to race, class, gender, and he is as free as Descartes was of any allusion to a world beyond the West. Physician, one is tempted to say to Toulmin, heal thyself.

RACE AND HISTORY: Selected Essays, 1938–1988. By John Hope Franklin. LSU. 450 pp. \$29.95

John Hope Franklin, born in 1915 in an all-black town in Oklahoma, is now completing his remarkable academic career as James B. Duke Professor of History Emeritus at Duke University. Along the way, he not only wrote such works as *From Slavery to Freedom* (1947), *Reconstruction After the Civil War* (1962), and *Racial Equality in America* (1976) but also served as president of America's four most prestigious historical associations. In 1915, it would have



An integrated jury during Reconstruction. By 1880, juries in the South were all white again.

been impossible to imagine such a career for a black teacher or scholar. But if what we have here is proof of the American Dream, it is a dream sullied by many slights and rebuffs, several of which are angrily recalled in this tough-minded collection.

All together, these 27 essays—which range from the racial perceptions of the Founding Fathers to 20th-century efforts to achieve racial equality—embody Franklin's lifetime program to revise American history "in order to place the Negro in his proper relationship and perspective." Consider, for example, the two essays on Reconstruction written by Franklin 30 years apart. In 1948, when Franklin surveyed

the relatively unresearched topic, Reconstruction was considered a tragic era during which white southerners suffered at the hands of rapacious Yankee carpetbaggers and their ignorant Negro minions. But by 1980, when Franklin published "Mirror for Americans," Reconstruction was understood as a serious attempt to establish some measure of racial equality.

Franklin's other major theme—the scholar's social responsibility—is dealt with in a selection titled plainly "The Historian and Public Policy." Much of Franklin's career coincided with the civil-rights upheaval, and he attempted to tread a course between both white and black extremists. Franklin believed that the black historian should remain calm and objective, refusing "the temptation to pollute his scholarship with polemics, diatribes, arguments." Dispassionate scholarship at times forced Franklin to repress his feelings in a way that "would not be satisfying to some, and . . . may even be lacking in courage. I do not commend it; I merely confess it." Yet Franklin's scholarship led him to his own variety of social activism. He provided expert witness in the courts and Congress; and he wrote the background studies for the NAACP's desegregation cases. Perhaps no scholar of his generation may more rightfully claim that "the historian is the conscience of his nation, if honesty and consistency are factors that nurture the conscience."

Science & Technology

MIND CHILDREN: The Future of Robot and Human Intelligence. By *Hans Moravec*. Harvard. 214 pp. \$18.95

THE EMPEROR'S NEW MIND: Concerning Computers, Minds, and the Laws of Physics. By *Roger Penrose*. Oxford. 466 pp. \$24.95

Last year a new computer program, playfully named Deep Thought, defeated several grand chessmasters at their own game. Such triumphs are seized upon by the people, especially popular-science writers, who argue that we are moving into a new reality, a 21st century shaped by computers that will take over almost all the tasks once done by people. Advocates of this argument for artificial intelligence—called, for short, "strong AI"—reason

that all human thinking is the process of complicated calculations that computers theoretically can, and one day will, do. (According to strong AI, our brain is only, as Marvin Minsky put it, a "computer made of meat.")

Strong AI has one of its most forceful spokesmen in Hans Moravec, director of the Mobile Robot Laboratory of Carnegie Mellon University. Narrating the history of the AI community, Moravec provides some comparisons to show where we now stand: The computers of the 1950s he likens in intelligence to a bacteria, while today's computers, he says, are on the intellectual level of a spider. Moravec makes some calculations of his own. The computing action of the human retina can be performed today by computer simulations; by calculating what fraction the retina's function represents of the brain's operation as a whole, Moravec extrapolates how long it will be, given the phenomenal rate of advances in computer technology, before computers can simulate all of the brain's operations. In 40 years, Moravec estimates, computers will have "human equivalence." From there, Moravec goes on to imagine a "postbiological" world in which computerized robots not only perform, for example, brain surgery on humans but even improve and reproduce themselves. Moravec's technological future resembles Stanley Kubrick's film *2001*, in which the computers end up seeming more human than the people.

Proponents of strong AI like to label their opponents "mystics," but Roger Penrose has impeccable scientific credentials. The Rouse Ball Professor of Mathematics at Oxford, he has contributed to the physics of the "Big Bang" origins of the universe, and his research with Stephen Hawking helped establish the plausibility of black holes. Penrose's refutation of thinking as programmed computation is straightforward: Computers can deal only with computable numbers, but there exists an entire branch of advanced mathematics that works with noncomputable numbers. Indeed, he cites numerous mathematical laws underlying the operations of both the brain and the physical world which have this noncomputational character. As he differentiates thought from mere computation—in an argument that brings in complexity theory, quantum mechanics, Einstein's relativity, Gödel's undecidability,