

defend lying, or at least to explain it sympathetically. While stipulating that lying cannot succeed unless truth is the norm, he maintains that “humanity would never have stayed the grueling course to its present high place on the evolutionary ladder on a diet as thin and meager as the truth.”

Nature, Campbell points out, routinely lies. The perched female firefly *photuris* imitates the mating signals of another firefly species, lures a male over, and eats him. A household dog—man’s best friend—will go to the door as if it wants out, and then race to claim the master’s vacated chair.

In a crisp and remarkably readable discussion of how philosophers have addressed the topic, Campbell demonstrates that truth has become less absolute and less compelling over the centuries. The “logos,” where reason exists in nature such that humans can tune it in, allowed a harmony with the Almighty until Ockham’s razor sliced God away (as being incomprehensible) in the 14th century. Niccolò Machiavelli’s prince had to be a fraud to maintain power over the stupid citizenry. We move from René Descartes, who believed that falsehood arises because the will is free, to David Hume, who elevated the search for truth even as he acknowledged that the lie might be useful, to Immanuel Kant, who subordinated the search for truth to the search for

meaning. Friedrich Nietzsche considered lying more natural than telling the truth, and Sigmund Freud deemed self-deception the key to human behavior.

Taking the next step, some modern-day philosophers conclude that there is no truth with a capital “T,” and that any truth we happen to find is conditional and transitory. As a result, the many faces of falsehood today outshine the dull, singular, and prissy quest for an absolute. Because thought is a captive of language, and language is promiscuous, unreliable, and downright mischievous, truth telling in modern society is battered and abused.

Early on, Campbell suggests that polygraphs work because lying is so contrary to the human psyche that it can be detected electrically—in essence, that we are hard-wired to tell the truth. He never returns to this provocative notion, one that seems at odds with his later contentions.

In the last few pages, he argues that social morality is more important in a democracy than individual morality, citing as an example Bill Clinton’s survival of the Lewinsky scandal. Where did this distinction between individual morality and social morality come from? Perhaps Campbell’s next book will explain, or perhaps I should re-read this one. In any event, the final destination may be surprising, but it’s very much worth the ride.

—JOHN FROHNMAYER

## SCIENCE & TECHNOLOGY

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### *A BRIEF HISTORY OF SCIENCE: As Seen through the Development of Scientific Instruments.*

By Thomas Crump. Carroll & Graf.

425 pp. \$28

This one-volume history of science begins with a preface explaining that it’s no longer feasible to write a history of science in one volume. The subject has grown too vast and varied. Scientists can barely stay abreast of their own disciplines, and academic historians prefer to dig narrow and deep.

As a retired professor of anthropology at the University of Amsterdam, Crump can afford to indulge his fondness for breadth and compendiousness, but by his own admission this book

can’t live up to its title. He discusses only what he calls the hard, exact sciences (is the reader to infer a smidgen of disdain for the soft, squishy ones?), and restricts the subject further by putting experimental discoveries and practical inventions at center stage, with the role of theory reduced to an occasional voice from the wings.

The author’s ambition, however, is laudable. He begins with some harsh words against Aristotle, whom he calls a “reason-freak” for coupling ineluctable logic with self-evident (to him) principles, such as the notion that heavy objects fall faster than light ones. The dogmatization of such erroneous ideas made true science impossible. Only when Francis Bacon

## Current Books

and others began to emphasize empirical facts and experimental tests could modern science begin.

Historians have conventionally identified Copernicus as a seminal early figure for his intellectual leap of putting the Sun at the center of our planetary system. But as Crump explains, ingrained philosophical prejudice led Copernicus to stick with perfectly circular orbits, which caused him no end of difficulty. It was Johannes Kepler, building on the massive compilation of observations by Tycho Brahe, who proved that the planets follow elliptical orbits. This apparently small geometrical innovation was an epochal development: It placed mathematical analysis of hard-won data above abstract reason in the forming of scientific theories.

Crump makes a worthy effort to explain the importance of devising reliable, standardized ways to measure things—distances, masses, times, electric currents, and so on. Such mundane matters are usually relegated to footnotes, but Crump provides anecdotes that illustrate how much ingenuity was required to solve these forgotten problems. Unfortunately, highlights such as these are buried in a generally rambling text in which the author is at pains to mention every experiment and invention he can think of and leave the reader to figure out their importance. As much as Crump wants to concentrate on observations and experiments, it takes theory to cohere apparently contradictory or inconsistent empirical findings into a comprehensible whole. His reluctance to provide clear summations of the bits and pieces of evidence is tantamount to writing a murder mystery and leaving out the final chapter.

—DAVID LINDLEY

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### *SCIENTISTS, BUSINESS, AND THE STATE, 1890–1960.*

By Patrick J. McGrath. Univ. of North Carolina Press. 248 pp. \$39.95

McGrath has written an extremely important intellectual history of American science in the 20th century. While delving into such familiar episodes as the Manhattan Project, the debate over the hydrogen bomb, the security hearing of J. Robert Oppenheimer, and various arms control issues, McGrath concentrates on

the larger question of how scientists changed American political culture. His insights are sure to stir controversy.

An independent historian trained at New York University, McGrath argues that beginning in the 1890s, an elite group of American scientists forged a profitable alliance with the country's corporate, political, and military elites. Initially, this alliance elevated the status of scientists in the public-policy arena. As expert technicians, these corporate scientists—such men as Frank Jewett, Karl Compton, David Lilienthal, Vannevar Bush, and James Conant—believed that science could transform America and inaugurate an era of economic progress, social stability, and national security. Inspired by that “Great Engineer,” Herbert Hoover, they thought of themselves as progressives who could construct a “harmonious, classless meritocracy.” In 1890, America had only four industrial research laboratories; by 1930, there were more than a thousand.

The meritocratic dream, together with Hoover's presidency, collapsed in the Great Depression. During World War II and then the Cold War, McGrath argues, a different vision of American science prevailed. The relatively moderate progressive vision of Lilienthal, Bush, and Conant was supplanted by a scientific militarism. “Scientists and administrators such as Edward Teller, Lewis Strauss, and Ernest Lawrence, with their full-throated militarism and anti-communism, pushed American scientists and their institutions toward a nearly complete and subservient devotion to American military interests.”

Even President Dwight D. Eisenhower felt compelled to protest. When an official committee in 1957 advocated expanding the nation's nuclear arsenal, Eisenhower said: “You can't have this kind of war. There just aren't enough bulldozers to scrape the bodies off the street.” Yet Bush, Conant, and the other moderates mostly stayed silent. “I kept in channels rather religiously, perhaps too much so,” Bush once reflected. By the 1960s, this once idealistic class of corporate scientists had made so many compromises that they had become mere technicians serving military masters. These experts, as McGrath puts it, “did not openly challenge the policies of their allies and benefactors. They were simply good soldiers.”

—KAI BIRD