

# SCIENCE & TECHNOLOGY

## *DEGREES KELVIN: A Tale of Genius, Invention, and Tragedy.*

By David Lindley. Joseph Henry Press.  
366 pp. \$27.95

Although no longer celebrated, William Thomson (1824–1907) was widely hailed in the 19th century as Britain’s greatest scientist. A mathematical prodigy, he published original work at the age of 16. He was knighted a half-century later as Lord Kelvin—the first British scientist elevated to the peerage—and at his death was buried in Westminster Abbey alongside Isaac Newton.

The dust jacket predicts that *Degrees Kelvin* will become the “definitive biography” of this brilliant man. But David Lindley, the author of *Boltzmann’s Atom* (2001), reveals little about Thomson’s day-to-day existence and does not try to dramatize his personality. Of Thomson’s two marriages, the reader learns little more than that his depressive first wife wrote graveyard verse and that his second wife seems to have been cheery. Tellingly, Thomson left behind some 150 green notebooks full of scientific ideas and mathematical calculations—“but nothing personal,” reports Lindley. Likewise, *Degrees Kelvin* records not so much Thomson’s life as his thinking.

As Lindley impressively shows, however, Thomson thought incessantly and productively. A founder of thermodynamics—the study of the relationship between heat and work—he gave this fundamental science its name and established the existence of an absolute zero of temperature. (A thermometric calibration system based on absolute zero is called the Kelvin scale.) His purchase of a yacht, in 1870, meant not only boating pleasure but a new

range of scientific questions to investigate, particularly the compass deviations caused by the ever-increasing amounts of iron used in ship construction. A technologist as much as a scientist, Thomson invented what was eventually adopted as the official compass of the Royal Navy. As a professor at Glasgow University—for 50 years—he coauthored the first undergraduate textbook on classical physics, which was also the first textbook to address such subjects as sound, light, heat, and magnetism as parts of a single discipline.

Lindley treats with lucid precision Thomson’s part in scientific debates and projects of the time. Thomson traded published charges and countercharges with geologists and biologists in the heated controversy over the age of the planet Earth. Active in the years-long international effort to establish

transatlantic telegraph communications, he worked on a theory of the transmission of a pulse of electricity through an insulated underwater cable. During several visits to the United States he lectured, met Thomas Edison and George Westinghouse, and was invited to head a commission to study the practicality of generating electricity from Niagara Falls.

Lindley thoughtfully evaluates the “tragedy”: Thomson’s decline into relative obscurity. He sees the scientist’s ever-active imagination as constrained by an unwillingness to take risky leaps. Living into a new era of physics that brought intimations of quantum theory and relativity, Thomson clung to his outdated view of a strictly mechanical universe, continued to maintain that the Earth was no more than a hundred million years old, refused to accept James Clark Maxwell’s universally recognized theory of electromagnetism, and expressed reserva-



William Thomson, Lord Kelvin

## Current Books

tions about the existence of atoms. In growing intellectual isolation, this once-celebrated scientist became “something of a crank,” Lindley concludes, “a living fossil.”

—KENNETH SILVERMAN

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### OPENING SKINNER'S BOX: *Great Psychological Experiments of the Twentieth Century.*

By Lauren Slater. Norton. 276 pages.  
\$24.95

In the 1940s, psychologist B. F. Skinner put his daughter in a Plexiglas box he called the “Heir Conditioner.” His theory, which launched one of the longest-running debates in psychology, was that scientists could shape human behavior through controlled environments and rewards. Skinner conditioned rats to press levers and cats to play piano, and he’s reviled for trying to control humans through science. As the story goes, he was somehow connected to the Nazis, and his daughter Deborah, raised in the box, lost her mind at 31, sued him, then shot herself in a bowling alley.

But according to Lauren Slater, a psychologist and the author of *Prozac Diary* (1998), that story is mostly myth. With her new book, she hopes to set the record straight about Skinner and other experimental psychologists. In 10 seamlessly woven essays, she outlines the history of well-known, mostly infamous studies and explains what they have taught us. And she does so with writing that alternates between stunningly original (people go into “moral overdrive”; the sun is “lanced of its light”) and downright annoying (rivers go “smash smash”; her heart goes “clippety clop”).

As always, Slater weaves fascinating stories: an adrenalin-junkie lobotomist “rid[es] high with his knife, not bothering to sterilize his instruments”; Stanley Milgram studies obedience to authority by directing subjects to administer what they think are electric shocks to screaming victims (actually actors). In the book’s strongest essay, Slater—a former institutionalized patient—repeats a 1970s experiment by faking psychiatric symptoms to see whether she can get committed. (She can’t, though she gets prescribed a total of 25 anti-psychotics and 60

antidepressants.) In another essay, she takes morphine daily and then stops cold turkey to test whether it’s physically addictive (she decides it’s not).

Unfortunately, when not writing about herself, Slater relies heavily on speculation that smacks of shoddy reporting. An example: She sets out to find Skinner’s daughter Deborah (who didn’t kill herself) but gives up after a few calls and then speculates wildly about Deborah’s life and mental stability. This approach does nothing to right the historical record, but the debate it has inspired might actually do so: Shortly after the book’s publication in March, an infuriated Deborah Skinner wrote a scathing rebuttal in the British newspaper *The Guardian*. Since then, several scientists have written articles, reviews, and letters charging Slater with “outright fabrications.” Some of the “fabrications” are indisputable errors, while others are simply the author’s interpretations of controversial people and events.

Along with recounting the psychologists’ experiments, Slater aims to address “the boldest questions” that they raise. If you follow orders to inflict pain on someone, she wonders, are you immoral? Are you not free? Good questions, but others also demand attention: What does morality dictate when questionable experiments produce valuable findings? And are human research subjects ever truly free?

In defending many of the controversial psychologists and their experiments, Slater takes some daring stances—such as saying that Antonio Egas Moniz, who plucked subjects from mental wards to try out his new procedure, the lobotomy, “gave us a way out of pharmacology,” for which we should thank him. But it’s just not that simple. Historically, many important scientific advances, including some recounted in this book, have been made at the cost of human dignity, human sanity, and human lives. It’s impossible to dismiss the results, but it’s critical to take account of the darkness of their origins. Slater illuminates the history and the importance of psychological research, but she leaves to readers an assessment of the ethics.

—REBECCA SKLOOT