

virtues of safer designs such as the thorium molten-salt reactor. If these changes are made and lessons are learned, he concludes, accidents like Fukushima should be behind us.

On the contrary, say Lochbaum, Lyman and Stranahan. “Nuclear power is an energy choice that gambles with disaster,” they write. “The problems that led to the disaster at Fukushima Daiichi exist wherever reactors operate.” They unpick those problems in forensic detail, using multiple sources in a thriller-paced retelling. *Fukushima* takes a much broader view of the accident than *Atomic Accidents*, delving into political wrangling and the roles of international agencies. It shows how Japan’s complex nuclear bureaucracy — involving power companies, an independent regulator and government departments — stymied the response. A vivid picture emerges of utter confusion in the hours and days after the tsunami.

The writers have impressive pedigrees. Stranahan was on the *Philadelphia Inquirer* team that won a Pulitzer Prize in 1980 for its coverage of the Three Mile Island accident. Industry insider Lochbaum and global-security specialist Lyman have both been heavily involved in the Union of Concerned Scientists’ lobbying on nuclear power.

That may explain why the second half of the book becomes an attack on the US Nuclear Regulatory Commission (NRC), which the authors argue is complicit in the industry’s disregard for safety. According to *Fukushima*, the NRC refused to learn from Three Mile Island, and failed to mandate that the industry prepare for similar events. The commission, the book claims, had run simulations showing that Mark 1 boiling-water reactors, designed by General Electric and installed at Fukushima, were vulnerable to meltdown in a power blackout. If the NRC had been bolder about improving safety at home, in the authors’ opinion, other countries would have followed — and Japan might not be facing a US\$100-billion nuclear clean-up.

Lochbaum, Lyman and Stranahan disagree strongly with Mahaffey’s stance on the benefits of smaller reactors, which would almost certainly be built in clusters: at Fukushima, simultaneous problems with multiple reactors complicated emergency-response efforts. “Nuclear power’s safety problems cannot be solved through good design alone,” they write. Instead, they say, the NRC must accept the possibility that dam breaches, fires or terrorist attacks could trigger a nuclear accident worse than Fukushima on US soil.

Both polemics offer thought-provoking analyses. However much they differ, they are both right: if nuclear power is to have a future, it needs better science and better regulation. ■

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## Books in brief



### The Future of the Mind: The Scientific Quest to Understand, Enhance, and Empower the Mind

Michio Kaku DOUBLEDAY (2014)

Taking a break from contemplating the cosmos, Michio Kaku plunges into the universe inside the skull, training his theoretical physicist’s eye on the field. His intriguing ‘space-time’ theory of consciousness frames the extraordinary findings emerging from ever-more-finely targeted brain scanning and other technologies. A fascinating sprint through everything from telepathy research to the 147,456 processors of the Blue Gene computer, which has been used to simulate 4.5% of the brain’s synapses and neurons.



### Girls Coming to Tech! A History of American Engineering Education for Women

Amy Sue Bix MIT PRESS (2014)

The Second World War flung open windows of opportunity on aircraft engineering for thousands of women in the United States. In the 1950s, many eager to pursue an engineering degree hit a wall; less than 1% of the era’s engineering students were female. Focusing on three iconic technology institutes (California, Georgia and Massachusetts), science historian Amy Sue Bix relates how these “oddities at best and outcasts at worst” made headway in closing the gender gap: women now earn one-fifth of degrees in the field.



### The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies

Erik Brynjolfsson and Andrew McAfee W. W. NORTON (2014)

In this comparative study of economic and digital progress, Erik Brynjolfsson and Andrew McAfee argue that we stand at an “inflection point” — poised to reap big rewards if we harness the forward leap of innovation. With measured optimism, they survey a digital landscape of exponential progress in computing power and application; technological benefits and their uneven spread; and policy. Crammed with analyses of everything from human–machine competition to the state of US education.



### Joy, Guilt, Anger, Love: What Neuroscience Can — and Can't — Tell Us About How We Feel

Giovanni Frazzetto PENGUIN BOOKS (2014)

Neuroscientist Giovanni Frazzetto enters the restless realm of human emotion through the portals of physiology, genetics, history, art and philosophy. Anger, guilt, anxiety, grief, empathy, joy and love are anatomized in turn, enlivened with research on everything from the role of monoamine oxidase A in anger to the engagement of opioid receptors as we thrill to music. And who knew that surrealist Salvador Dali created an art installation in the shape of a giant caterpillar to explore the process of sedation?



### GDP: A Brief but Affectionate History

Diane Coyle PRINCETON UNIVERSITY PRESS (2014)

A raft of economists, including Robert Costanza (see *Nature* 505, 283–285; 2014), argue that gross domestic product (GDP) is a flawed measure of national prosperity, hiding social inequality and pushing growth at the planet’s expense. Economist Diane Coyle is less severe in this brief, lucid history. She traces GDP from its roots in the eighteenth century to its twentieth-century heyday, offering a smart analysis of its status and uses now, as a one-note statistic in an increasingly complex world. [Barbara Kiser](#)