



A Second World War Marine M-4 tank carries a mine detonator installed by the US Navy Seabees.

MILITARY TECHNOLOGY

Deadly ingenuity

Two takes on two generations of problem-solving ‘geeks of war’ fascinate **Sharon Weinberger**.

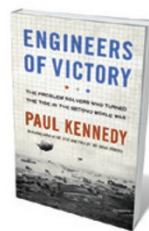
In November 1940, as the German Luftwaffe was carrying out devastating bombing raids over England, Air Chief Marshal Hugh Dowding wrote, “The war will be won by science thoughtfully applied to operational requirements.”

Paul Kennedy offers a slightly different view in *Engineers of Victory*. The noted historian argues that a larger group won: “problem solvers, the scientists and engineers and organizers.” A similar crowd stars in Christopher Coker’s very different book, *Warrior Geeks*. But whereas Kennedy celebrates such military innovators, Coker — an expert in British defence policy at the London School of Economics — posits that they are depriving us of heroic values of war that date back to ancient Greece.

Kennedy, whose *The Rise and Fall of the Great Powers* (Random House, 1987) covered centuries, narrows his focus in *Engineers of Victory* to a series of complex battles fought across air, land and sea between January 1943 and June 1944. His goal is to

identify the neglected “men in the middle”, such as Admiral Ben Moreell and Ronnie Harker. Moreell was the founder of the US Navy Seabees, construction battalions whose building sprees included the Tinian airstrip used by the B-29s that delivered the atomic bombs; Harker was a British test pilot whose push to have the American-built P-51 Mustang aircraft outfitted with the British Merlin engine endowed the Allies with aerial superiority.

The book’s multilayered descriptions provide keen insight into the complex management that enabled the Allies to win the war. D-Day is a case in point. Kennedy describes



Engineers of Victory: The Problem Solvers who Turned the Tide in the Second World War
PAUL KENNEDY
Random House: 2013.
464 pp. \$30

the crucial part management played in that victory — by, for instance, coordinating logistics, protecting front-line troops and even ensuring underwater demolition teams could dispose of barbed wire. “Without the middle personnel and the systems they managed, victory would remain out of grasp,” writes Kennedy.

Kennedy’s love of middle management

is somewhat perplexing, however: the scientists in particular often fail to surface in the book. Kennedy is more at ease describing the field of battle than technological innovation. The contribution of the Radiation Laboratory at the Massachusetts Institute of Technology in Cambridge, for example, is mentioned only in passing. Yet Kennedy relishes battlefield arcana, giving the precise number of battleships, cruisers and destroyers for specific engagements, such as the convoy battles of March 1943. This is periodically useful, but at other times evokes US President Barack Obama’s stinging criticism of his rival Mitt Romney in a televised debate: “The question is not a game of Battleship, where we’re counting ships. It’s what are our capabilities?”

What is missing is an analysis of the mechanism behind this middle-management-engineered victory. Kennedy repeatedly throws in the term “feedback loop” — the ability to make improvements in real-time on the basis of new information — as a deciding factor. He argues that the United States and United Kingdom, unlike Japan and Germany, had this kind of flexibility, allowing them to learn from their mistakes. Of course, if this were true across the board, one has to wonder how the Soviets prevailed under Joseph Stalin, whose feedback loop for middle managers often consisted of a bullet to the head.

Yet there is something to Kennedy’s argument about adaptability in warfare. Insurgents in Iraq and Afghanistan have proved very adaptable: when coalition forces employed jammers to block the mobile-phone signals used to detonate roadside bombs, they quickly switched to pressure plates and hard wires. By contrast, it took the Pentagon many months to acknowledge that the vulnerable, thin-skinned Humvee vehicles used in Iraq needed replacing.

In *Warrior Geeks*, Coker turns the idea of management on its head. In this fascinating historical and philosophical tour of modern warfare, Coker seizes on some concepts Kennedy mentions only in passing,



Warrior Geeks: How 21st Century Technology is Changing the Way We Fight and Think About War
CHRISTOPHER COKER
C. Hurst and Co.:
2013. 384 pp. £25

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such as the introduction during the Second World War of management science and operational research, which went beyond improving weaponry. “The actual use of those weapons and the organization of men using them were seen as scientific problems in themselves,” Coker writes of this change. He sees that application, however, as depriving soldiers of their humanity, arguing that the feedback loops lauded by Kennedy are “post-heroic”.

The chief concern outlined by Coker is that the ingenuity driving military science is spiralling out of control. The ‘geeks’ are creating technologies — designer drugs, robotics and neural devices — that, ultimately, he feels, will dehumanize us.

Coker drives home his points with much reference to philosophy and literature, segueing smoothly from trashy Hollywood films such as the forgettable *Stealth* (Rob Cohen, 2005) — rogue drones, anyone? — to the work of the Polish poet Zbigniew Herbert. Sometimes, the philosophizing goes over the top. For instance, Coker sees efforts to develop pharmaceutical interventions to treat post-traumatic stress disorder (PTSD) as scientists wanting to eliminate guilt through drugs. People affected by severe PTSD might argue that such research is in fact about treating symptoms so debilitating that sufferers are often left without jobs or family.

There is much to be said about the dangers of technologically driven warfare, such as the use of armed drones for targeted killings. But the senseless slaughter, in 1994, of more than 500,000 people in Rwanda was carried out in large part by men with machetes. Coker might argue that this form of genocidal warfare was never imbued with Greek values in the first place. But the sheer brutality of that war leaves me doubting that killing someone with the crudest of weapons is any more human, or heroic, than killing by gun-toting robots.

The power of both these books lies in how they prompt us to look through the authors’ prisms at the now more than 10-year-old war in Afghanistan. Would empowering Kennedy’s problem solvers allow the United States to prevail? Probably not: the building of a modern nation defies managerial or technical solutions.

On the bright side, I remain unconvinced that Coker’s geeks are going to strip us of our humanity. If that happens, we should blame neither the scientists nor the middlemen, but the politicians who take us into misguided wars in the first place. ■

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Books in brief



Heart of Darkness: Unraveling the Mysteries of the Invisible Universe

Jeremiah P. Ostriker and Simon Mitton PRINCETON UNIVERSITY PRESS 288 pp. \$27.95 (2013)

In this sweeping chronicle of cosmology, astrophysicist Jeremiah Ostriker and science historian Simon Mitton seamlessly blend historical narrative with lucid scientific explication, from the deeps of classical time to the data-fuelled hyperdrive of the past 50 years. The authors shine what light there is on dark matter and dark energy — a combination Ostriker has helped to pioneer in his models — but admit that the picture is incomplete and plenty of discovery awaits.



Heat: Adventures in the World's Fiery Places

Bill Streever LITTLE, BROWN 368 pp. \$26.99 (2013)

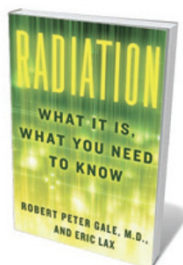
Biologist Bill Streever might be forgiven for switching from *Cold*, his debut best-seller, to *Heat*: he lives in Alaska. This intense, pacy ride through the thermal kicks off with thirst and ends with quarks freed by heat at the Relativistic Heavy Ion Collider at Brookhaven National Laboratory in Upton, New York. In between, Streever treats us to California wildfires and the chaparral they feed on, John Tyndall’s discovery of greenhouse gases, the culinary chemistry of Hervé This, arson, Hawaiian lava fields, atomic bombs, charcoal-burning and even fire-walking. Simmering with verve throughout.



The King of Infinite Space: Euclid and His Elements

David Berlinski BASIC BOOKS 192 pp. \$24 (2013)

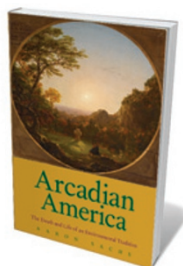
Fifty years might be a triumphant span for today’s textbooks. Euclid’s *Elements* is still fresh after 2,300. As mathematician David Berlinski writes in this pared and elegant homage to the peerless geometer and his magnum opus, the influence of Euclid’s axiomatic system remains vast. Berlinski unpacks the axioms, propositions and proofs along with their passage through history — from their influence on Copernicus and Bertrand Russell (who called his encounter with *Elements* “as dazzling as first love”) to the non-Euclidean world that sprang open in the nineteenth century.



Radiation: What It Is, What You Need to Know

Robert Peter Gale and Eric Lax KNOPF 288 pp. \$26.95 (2013)

Medical veteran of hot zones from Chernobyl to Fukushima, Robert Peter Gale — haematologist, oncologist and expert in bone-marrow transplants — delivers a guide for those perplexed by radiation. With science writer Eric Lax, Gale weighs up the risks and benefits of industrial, medical and natural radiation clearly, logically and with ample science. But it is Gale’s phenomenal frontline experience that gives this book edge — not least a bizarre incident in Goiânia, Brazil, where caesium-137 scavenged from an abandoned radiation-therapy machine eventually affected more than 100,000 locals.



Arcadian America: The Death and Life of an Environmental Tradition

Aaron Sachs YALE UNIVERSITY PRESS 496 pp. \$35 (2013)

From Yosemite to Yellowstone, the US national parks remain a historical touchstone for national environmentalism — but not the only one, argues Aaron Sachs. In a rich mix of history, cultural critique and memoir, Sachs reveals the cemetery as a half-forgotten nineteenth-century landscape tradition. These micro-Arcadias inspired close observation of nature in increasingly urbanized spaces, as well as contemplation of mortality and the sublime.