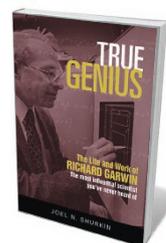




Richard Garwin with his equipment for studying solid helium-3 at IBM in the 1960s.



**True Genius: The Life and Work of Richard Garwin, the Most Influential Scientist You've Never Heard Of**  
JOEL N. SHURKIN  
*Prometheus: 2017.*

in Illinois with nuclear pioneer Enrico Fermi, who famously called Garwin the only true genius he had met (G. Farmelo *Nature* **538**, 168–169; 2016). Garwin's early career also included a stint at Columbia University in New York City with a Nobel-prize-winning team, led by Leon Lederman. They discovered that the radioactive decay of elementary particles called muons doesn't

obey otherwise-universal rules. He left academia in the early 1950s, disliking his field's increasingly large teams and experiments, for what would be a long career at IBM in New York state. Here, he invented and advised on whatever they threw at him.

Garwin's expansive skill set found other outlets, too. About the same time, he was a consultant on nuclear weapons at the Los Alamos National Laboratory in New Mexico. Theoretical physicist Edward Teller, a key member of the Manhattan Project, was then grappling with the design for a hydrogen bomb. Garwin supplied him with a detailed and ultimately successful working diagram. Arguably, that coup set Garwin on another life-long career. He convinced IBM to pay him to use a third of his work time to advise the US government on the scientific aspects of national security, often as part of the elite and somewhat secretive JASON group, alongside physicist Freeman Dyson. He also twice served terms on the President's Science Advisory Committee.

Garwin worked on several problems at any one time and on the same problems over time. Early in the cold war, in the 1950s, he advised on a computer system to process radar that detected Soviet bombers. In the Vietnam War, he helped to develop a computer-coordinated network of electronic sensors, meant to slow the supply of men and materials down the Ho Chi Minh trail between North and South Vietnam. From the 1960s, he was involved with highly classified surveillance satellites that sent photographs back first in capsules, and later digitally, by radio.

In the 1970s, Garwin testified against the supersonic transport, the US answer to the British–French Concorde — helping to cement its demise at the hands of Congress. In the 1980s, he was in the middle of arguments with the military about the best ways and places to house missiles. He was also opposed to ill-advised plans by Ronald Reagan's administration for a Strategic Defense Initiative to use missiles or laser beams to deflect enemy missiles mid-flight; in discussions, he

## PHYSICS

# Six decades of science advising

**Ann Finkbeiner** scrutinizes a biography of supremely inventive particle physicist Richard Garwin.

The biographer who takes on the complexity that is Richard Garwin is brave. In the 1950s, Garwin did an experiment showing an anomaly in radioactive decay that is now standard particle physics. Since the middle of that decade, he has advised the US government on matters from spy satellites to nuclear proliferation, gravitational-wave experiments, the investigation into the assassination of President John F. Kennedy and health-care records. Now, at 88, he holds 47 patents, ranging from a

gaze-controlled computer to a mussel washer. The sheer number of difficult, unrelated subjects, each with its own history and context, complicates any understanding of the man.

In *True Genius*, Joel Shurkin plunges into the maelstrom. The former *Philadelphia Inquirer* science reporter emerges with a mildly confusing synopsis of Garwin's life and little sense of his character.

In 1949, as Shurkin notes, Garwin finished a doctorate in physics after only two years. He was working at the University of Chicago

“tore every argument to shreds”. In the 1990s, Garwin worked on protection against radiological weapons; in the 2000s, on protection against bioterror; in the 2010s, on solutions to the disasters at the Japanese Fukushima Daiichi nuclear plant and the Deepwater Horizon oil rig. From 1960 to the present, he has been involved one way or another in every treaty to limit or ban nuclear weapons.

Shurkin concludes with a summary of Garwin’s characteristics: his appearance (“rumped”), whether he is religious (“not very”), his children (three, all with advanced education and interesting careers. His daughter Laura served as both *Nature’s* chief physics editor and head of its North American office). Garwin’s colleagues, such as fellow members of JASON and science advisers including the late Wolfgang Panofsky, supply adjectives and anecdotes.

Garwin is seen as intimidating, impatient, brilliant. He remembers everything; sees solutions that are technological rather than personal; and is surprisingly happy not to take credit. This last characteristic, alluded to in the subtitle “the most influential scientist you’ve never heard of”, would seem to be the author’s only assessment of Garwin, and it

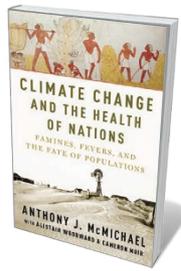
**“From 1960 to the present, he has been involved in every treaty to limit or ban nuclear weapons.”**

is dealt with in two and a half pages. Disregard for personal credit surely can’t be the most important motivation for a man in his eighties who still regularly fills his backpack with documents to support his arguments, takes the train from upstate New York to Washington DC, and then takes the Metro to whatever white marble building currently houses the people who need his advice.

Readers should put down a biography feeling that they’ve just left someone they’ve known a long time. *True Genius* presents them with a long list of national problems in which Garwin has been involved, sometimes with relevant context. But they don’t often learn what Garwin actually did. Nor will they know what to make of Garwin: what drives him, what good he has done or where he fits in the history of scientists who advise governments. Granted, it is supremely difficult to understand this smart, experienced, complex, driven man, as I found when writing my own book about JASON. But in these days, when governments are especially in need of well-thought-out advice based on evidence, an equally well-thought-out book about that man needs to be written. ■

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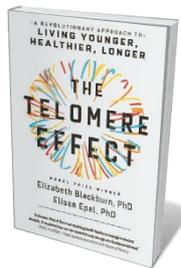
## Books in brief



### Climate Change and the Health of Nations

Anthony J. McMichael OXFORD UNIVERSITY PRESS (2017)

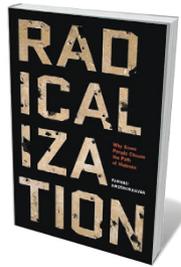
The magnum opus of the late epidemiologist Anthony McMichael, this study lucidly, and at times lyrically, chronicles 200,000 years of human history through a climate lens. McMichael unpicks the intricate choreography of climatic shifts, disease outbreaks and resource conflict to show how climate change has become ingrained in our biology and culture. He shows how anthropogenic climate change is the ultimate Faustian pact, trading material advance for environmental degradation; yet he hopes that the “integration of eight billion networked cerebral cortexes” may yet find a way through.



### The Telomere Effect

Elizabeth Blackburn and Elissa Epel GRAND CENTRAL (2017)

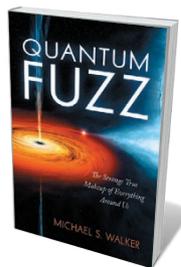
Nobel-prizewinning biologist Elizabeth Blackburn and health psychologist Elissa Epel distil reams of research for this smart, invigorating how-to book on maintaining cell longevity. Meshing Blackburn’s work on telomeres — the chromosomal ‘caps’ that are biological indicators of life experience — with Epel’s research on stress, the volume outlines a regime designed to boost telomerase, the enzyme that replenishes telomeres. Much will be familiar, from aerobic fitness to emotional balance. But as a clear, detailed line-up of key lifestyle changes and their biological implications, this is a winner.



### Radicalization: Why Some People Choose the Path of Violence

Farhad Khosrokhavar (transl. Jane Marie Todd) THE NEW PRESS (2017)

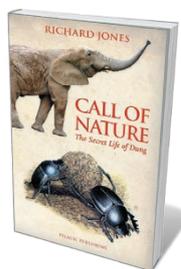
With security high on national agendas, the debate over radicalization and its roots rages on. Drawing on economics, anthropology and political science, sociologist Farhad Khosrokhavar examines historical examples such as Italy’s Red Brigades of the 1970s and 1980s, but focuses mainly on radical Islamism today, tracing paths to conversion step by step. Some European-born terrorists, he shows, are poverty-stricken victims of racism with a “narcissistic attachment to their own pain”, vulnerable to the sanctification of victimhood and groupthink; others are self-radicalized lone wolves. Cogent and timely.



### Quantum Fuzz: The Strange True Makeup of Everything Around Us

Michael S. Walker PROMETHEUS (2017)

Physicist Michael Walker’s foray into ‘quantum weirdness’ is firmly grounded in physics history — notably the 1927 Solvay Conference in Brussels, at which Paul Dirac, Niels Bohr and others fomented a revolution. Walker attacks his subject with energy, examining experimental and theoretical results; implications such as entanglement; and the apparent disjunction between general relativity and quantum mechanics. The passages on applications, from quantum computing and encryption to nanotubes and graphene, are gripping, but the whole is a bit too episodic.



### Call of Nature: The Secret Life of Dung

Richard Jones PELAGIC (2017)

A hyena’s is white; an otter’s smells of violets. Dung, reveals entomologist Richard Jones in this deft treatise, is a wonder of the biosphere. Jones is a witty guide to the mammalian digestive tract, animal waste as an ecological resource and the scores of insects that live in or on excrement, including the hulking Pride of Kent (rare rove beetle *Emus hirtus*). Jones’s dung identification guide is another delight for the amateur naturalist: we learn, for instance, that wombat excrement resembles “miniature bread loaves”. **Barbara Kiser**