the citizens have curiosity and focus. The book opens and closes with a supreme exemplar of a lay scientist: seventeenth-century Dutch businessman Antonie van Leeuwenhoek, who pioneered microscopy and discovered bacteria and protozoa, opening up the universe of microbiology. His discoveries — based on everyday substances in his Delft home, such as saliva — and the wonder they excited in him epitomize the ideas in *Never Home Alone*.

Just one of Dunn's arguments fails to convince. He asserts that some organisms, such as fruit flies and house mice, are important because they have become iconic model lab species, or because, like the *Penicillium* fungus, they could be sources of drugs. He suggests that by understanding the biology of, for example, domestic camel crickets — which thrive on very poor diets — we might learn new ways of breaking down intractable materials such as plastic. Quite so; but none of it depends on the fact that these organisms can be found in homes. Biologists find useful animals anywhere, from the axolotl to the hagfish and the *Xenopus* frog.

The results of the projects described are important. The indoor biome is huge. Humans are an urbanizing species, and in most cities, the combined floor space of homes and apartments exceeds that of the ground space outside. If we are to chart a harmonious settlement with the species living with us, we need to understand as much as possible about them.

I think this research has even broader significance. Since the Darwinian revolution, we have accepted that, biologically, we are one species among millions, subject to the same laws of evolution by natural selection. It is less clear that we have accepted that we are also subject to the same ecological laws. We know we can control, disrupt and destroy the ecosystems of the world, but we tend to imagine that we do so from inside a hermetically sealed personal bubble. By reframing our homes and selves as ecosystems, we are forced to contemplate how we fit in with the complex community of organisms with whom we share our lives.

The book has one final message. We have "farsighted" ecologists (Dunn's term), whose eyes are fixed on the distant, charismatic ecosystems of rainforest and coral reef. We also need near-sighted ones who will study the half-hidden communities closely quartered with us in our homes. This book is their battle cry. ■

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SPUTNIK/SPL

UK crystallographer Dorothy Hodgkin and Soviet physicist Moisey Markov at a 1983 Pugwash conference.

HISTORY

The covert politics of cold-war science

Ann Finkbeiner reflects on an era when research and education were co-opted to promote a government line.

In the late 1950s, students in a Hong Kong school were dissecting local earthworms and labelling the parts to match diagrams in a British textbook — even though the worms in Britain and Hong Kong were anatomically different. Watching the children, US herpetologist and educator Arnold Grobman noted that they were being directed to follow the textbook over their own observations.

The students' reliance on authority was not what worried Grobman. The real danger, he said, is that this choice "left the students vulnerable to the influence of Communism".

So begins science historian Audra Wolfe's *Freedom's Laboratory*, a study of how the United States won the cold war partly by embracing and promoting ideals embraced by science itself. Today, equating unquestioning trust in authority with vulnerability to Communism sounds overwrought. But at the time, the tense stand-off between the Soviet Union and the United States (which ran roughly from 1947 to 1989) was ramping up. Almost simultaneously with the start of the cold war, the Soviet Communist Party endorsed a pseudoscientific stance: Lysenkoism, the political campaign to reject Mendelian genetics, headed by agronomist Trofim Lysenko. Stocks of *Drosophila* fruit flies for research were destroyed, and Soviet geneticists were fired, imprisoned, exiled or executed.

Freedom's Laboratory: The Cold War Struggle for the Soul of Science
AUDRA J. WOLFE
John Hopkins University Press (2018)

One US countermeasure against Communism, as Wolfe shows, was to present democracy as a bastion of scientific freedom for nations aligned against a totalitarian state. This message fitted the ideals of scientists and scientific institutions, so they went along with it. Scientists are ideally driven by curiosity and logic, not politics. But politics, writes Wolfe, were crucial to how the US government "constructed and maintained" the equation of science with freedom.

This politicization took advantage of scientists' habits of international collaboration. In the early 1950s, the US government, in particular the Department of State and the CIA, tried using independent scientists as attachés — actually, spies. This mirrored Soviet practice. (I recall old US physicists' stories of visiting Soviet scientists announcing that they needed to take photos of, say, local military depots.) As Wolfe shows, however, the US scientist-spies proved ineffective.

Meanwhile, the State Department, CIA and National Academy of Sciences sponsored international conferences and travel to promote scientific freedom. The US government also used the international Pugwash

organization, a group of nuclear scientists who promoted disarmament, to demonstrate the virtues of independent Western science.

Another avenue for politicizing science was education. In the early 1960s, the CIA, through a wide-ranging Asian–American partnership called the Asia Foundation, supported the high-school Biological Sciences Curriculum Study (BSCS). This taught pupils to ask their own questions, make their own observations and come to their own conclusions. Translations of the BSCS were promoted internationally and ultimately used in 35 countries. "Lysenko's name is never stated explicitly in these texts," writes Wolfe, but the "emphasis on rejecting received knowledge" is implicit throughout.

In 1967, the CIA's involvement in "youth groups, organized labor, cultural organizations, and private foundations" such as the Asia Foundation became public. Amid uproar, the administration of US president Lyndon B. Johnson announced the end of covert CIA support of private institutions. Some scientists were chagrined by what they saw as a cynical use of science in propaganda. The programmes, dubbed "CIA orphans", could not be overtly re-funded by the government or foundations. So the government looked for 100 "private voluntary organizations that 'did the kind of work'" the orphans had done. The Asia Foundation ended up being funded by the State Department.

With covert shenanigans suspended and the US government out of the "hearts and minds" business, the focus of the conflict between free and state-approved science moved to Soviet dissident scientists, including nuclear physicist Andrei Sakharov, who campaigned for human rights and was later arrested. Now scientists on both sides were acting not as agents of states, but as individuals — writing letters, raising funds, boycotting, signing petitions, lobbying, protesting. "By 1980," Wolfe writes, "there was only one 'science' and it looked remarkably like the vision advanced by the West." Sakharov was freed in 1986, the Soviet Union collapsed in 1991, and the cold war was over for good.

How, in hindsight, to assess this history? Were the scientists who worked knowingly or unknowingly with the government either collaborators or dupes? Cold-war history, Wolfe writes, is not a heroes-and-villains narrative: it must be told in "shades of gray". The government used scientists' ideals for its own political reasons. And the scientists, who saw themselves as apolitical, used the government's political messages and support to question, observe, conclude, write and speak — freely and in accord with their ideals. ■

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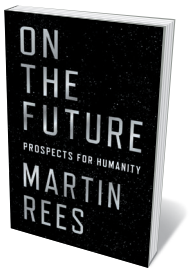
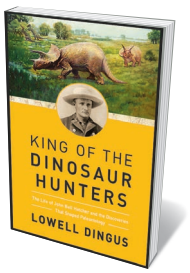
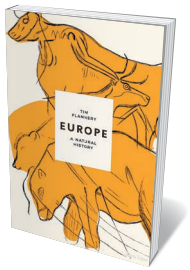
Books in brief



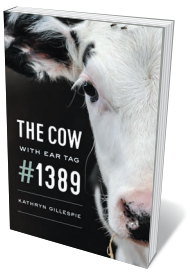
On the Future
Martin Rees PRINCETON UNIVERSITY PRESS *(2018)*
UK astronomer royal Martin Rees faces the future as scientist, citizen and "worried member of the human species". His bold, beautifully synthesized primer paces from human-driven challenges such as climate change to dizzying astronomical discoveries within and beyond the Solar System. Rees celebrates technological advance, but warns of the potential for abuse, reminding us that the benefits of progress can dim in the face of inequity and natural catastrophes. And he argues that a yen for Martian colonies must not leave Earth in the dust. A clarion call for global, rational, long-term thinking.



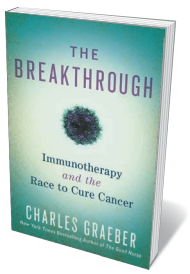
King of the Dinosaur Hunters
Lowell Dingus PEGASUS *(2018)*
By his death in 1904, US palaeontologist John Bell Hatcher had unearthed a vast trove of fossils, including scientifically important *Triceratops* remains and 66-million-year-old mammal teeth. His finds went on to seed prestigious US collections such as that in the Carnegie Museum of Natural History in Pittsburgh, Pennsylvania. Palaeontologist Lowell Dingus exhaustively tracks Hatcher's short but storied life, from early work for luminaries such as Othniel Charles Marsh to the astounding digs in fossil hotspots from Kansas to Patagonia that studded Hatcher's starry scientific trajectory.



Europe: A Natural History
Tim Flannery ALLEN LANE *(2018)*
Some 100 million years ago, Europe was a tropical archipelago and, as a bridge between Africa, Asia and North America, a migratory hotspot. It became a protean, fecund region for hybridization. Palaeontologist Tim Flannery's natural history takes us from the dinosaurs' demise 66 million years ago to today. We meet the four-tusked elephant-like gomphothere, the nimravid (a sabre-toothed cat), and the hominin *Graecopithecus* (by way of footprints left on what is now Crete, 5.7 million years ago). The litany of extinctions ends in de-extinction projects such as the 'mammophant'. A rich, illuminating journey.



The Cow with Ear Tag #1389
Kathryn Gillespie UNIVERSITY OF CHICAGO PRESS *(2018)*
What price a glass of milk? In this trenchant examination of the dairy industry, animal-studies researcher Kathryn Gillespie investigates its workings, wastefulness (farmers in the US Midwest and Northeast dumped 300 million litres of milk in early 2017) and impacts on the environment, such as leaks from manure lagoons. Gillespie's central focus, however, is the effect on the cows, bulls and calves involved, before their inevitable slaughter. Her careful field research in auction yards and slaughterhouses shows how commodification of animals too often leads to severe, and disturbing, health and welfare issues.



The Breakthrough: Immunotherapy and the Race to Cure Cancer
Charles Graeber TWELVE *(2018)*
In this deft, detailed study of cancer immunotherapy, journalist Charles Graeber traces the breakthroughs leading to cutting-edge treatments today. Interwoven with the advances and portraits of researchers and patients is a fascinating backstory of medics who, from the late nineteenth century onwards, saw a link between infection and spontaneous regression of cancers. From the once-discredited pioneer William Coley to immunologist and Nobel laureate James P. Allison, they form a brilliant, driven, admirably stubborn group that Graeber brings vividly to life. **Barbara Kiser**