► features of the more canonical one. As elegant as the details underpinning the thesis seem, it is occasionally hard to distinguish between fact and speculation. Lane has, nevertheless, made a bold and commendable attempt to sketch out a highly challenging scientific issue for a general audience. In so doing, he has reaffirmed the importance of a largely overlooked area of basic research, and has generated testable hypotheses about the origins of complex life.

Falkowski covers some of the same details of the evolution of microbes and their contribution to complexity, including the historical origins of the concept of endosymbiosis. However, his focus is primarily on how microorganisms have made Earth habitable, perhaps most notably with the development of oxygen-generating photosynthesis by cyanobacteria. This leads him to touch on humanity's potential to undermine Earth's systems.

History has shown how modifications to microbial biochemistry affect global geophysical processes. For example, following 200 million to 300 million years of photosynthesis by ancient microorganisms, oxygen became a significant component of Earth's atmosphere, increasing ozone levels, reducing the greenhouse effects of gases such as methane and leading to one of the most extensive glaciations in the planet's history. Humanity's interference with natural biological processes risks damaging Earth in ways that cannot be predicted.

What is clear is that a deep understanding of how complex life originated will provide insights into human biology and the nature of disease processes. It may also enable the generation of forms of life unconstrained by the contingent processes that locked life into its current trajectory. Life as we know it may eventually be supplanted, perhaps one day even being viewed as a primordial soup that facilitated the emergence of silicon-based existence. ■

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VIROLOGY

Journal of the plague years

Mark Dybul applauds the latest chapter in an account of a life at the leading edge of HIV research and policy.

Virologist Peter Piot's *AIDS Between Science and Politics* is a terrific follow-up to his highly acclaimed memoir *No Time to Lose* (W. W. Norton, 2012). It demonstrates the deep intellectual lessons of a lifetime at the cutting edge of science and politics. Piot's narrative ranges from his thrilling, on-the-ground experiences in remote regions of Africa as a young scientist and member of the team that identified Ebola, to the high-altitude reflections of his years as executive director of the Joint United Nations

Programme on HIV/AIDS (UNAIDS).

Three messages underpin the book's nine chapters. One is that the HIV epidemic generated an unprecedented local and global response, recast many development and health paradigms, and ultimately triggered treatments that have saved millions of lives. The second is that progress was made only when various scientific disciplines, on-the-ground implementation strategies and politics were aligned. And the third? That AIDS is not over.

This Changes Everything: Capitalism vs the Climate
Naomi Klein ALLEN LANE 2015

Unafraid to name and shame fossil-fuel junkies hooked on a billion-dollar industry, Naomi Klein investigates capitalism and climate change. She sees the global crisis as a potential spur to positive action, as happened with the women's rights movement. (See Nico Stehr's review: *Nature* **513**, 312; 2014.)

The Boom: How Fracking Ignited the American Energy Revolution and Changed the World

Russell Gold SIMON AND SCHUSTER 2015

Journalist Russell Gold traces the rise of fracking, a tale of innovation and investment — such as ex-oilman Aubrey McClendon's 260,000 land acquisitions in Texas's Barnett Shale. (See Chris Nelder's review: *Nature* **508**, 185; 2014.)

Piot observes that HIV is one of the most devastating plagues in history, reducing life expectancy in countries such as Botswana by around 30% — and wiping out decades of gains in health and development. Even in places that have not been affected on that national scale, it has devastated groups of the most marginalized and vulnerable people, including men who have sex with men, transgender people, people who inject drugs, sex workers, prisoners and others. Piot also points out the links with historical injustices such as the 1948–94 apartheid in South Africa, where the social fabric was so badly damaged and the mistrust of the authorities grew so deep that it exacerbated the outbreak of the epidemic.

Piot traces the early days of the response to HIV/AIDS, when governments closed their ears and wallets to the growing epidemic.

AIDS Between Science and Politics
PETER PIOT
Columbia Univ. Press: 2015.

People with the virus rallied to fight for attention and resources, with increasing energy and sophistication. Remarkable individual and community action effected a breath-taking shift from a paternalistic, government-only approach to development and health, to one in which partnership and inclusivity provided a more effective response.

From such a heady climate were born the Global Fund to Fight HIV, Tuberculosis and Malaria in 2002 and the US President's Emergency Plan for AIDS Relief (PEPFAR) in 2003, both aiming to provide funding for programmes in countries most affected by the diseases. Perhaps of even greater significance was the growth of multisectoral local institutions, including national AIDS councils in dozens of countries, often reporting to the head of state. And there has been an increase of billions of dollars in domestic financing for HIV/AIDS response. As a result, many millions of lives have been saved and lifted up.

The theme of effective partnerships that span disciplines, politics and theologies (religious, scientific and otherwise) permeates the book, and is reflected in its title. The science is complex, as are the politics,

and they are intimately linked owing to social elements, and the discrimination and stigma they engender — what Piot calls the challenge of “sex, drugs and rock and roll”. Data, modelling and advocacy were essential to move national and global politics, but political leadership also drove a demand for scientific advance, data and results.

At a national level, Piot praises former president of Botswana Festus Mogae for his personal leadership in declaring, in 2001, that HIV was a threat to his country's existence. Mogae dedicated significant national resources to antiretroviral therapy at a time when much of the global health community scoffed at the viability of such a programme in Africa. These moves were strengthened by an alliance with the Bill & Melinda Gates Foundation and with pharmaceutical giant Merck, creating what Piot deems perhaps the most successful and impactful public–private partnership in history. At the global level, Piot singles out the push by then-UN secretary-general Kofi Annan for the creation of the Global Fund, and George W. Bush's efforts towards the inauguration of PEPFAR.

Piot is honest about failures. He cites an effort he pioneered in the mid-2000s to engage the US and European pharmaceutical industries in expanding access to antiretroviral treatment for people in low-income countries. The opposition came from a diverse group of people and institutions, including academics and political activists, who feared that participation by the pharmaceutical industry would be geared towards increasing profits, not expanding access.

He is also clear about the need to remain focused and vigilant. In his view, the epidemic could be significantly reduced with sufficient resources, channelled to where they would make the most difference. This is the heavy baton that has been picked up by Piot's successor at UNAIDS, Michel Sidibé.

AIDS Between Science and Politics is a must-read for anyone interested in the HIV/AIDS epidemic. More broadly, it offers lessons — and interesting anecdotes — useful in the response to Ebola and indeed to every challenge in global health and development. ■

Mark Dybul is executive director of the Global Fund to Fight AIDS, Tuberculosis and Malaria in Geneva, Switzerland.

The Knowledge: How to Rebuild Our World After an Apocalypse

Lewis Dartnell VINTAGE 2015

In a post-apocalyptic world, could we rebuild civilization? Lewis Dartnell condenses millennia of achievement into a handbook on mastering Earth's resources to produce food, energy and medicines using our “greatest invention”: science.

Islands Beyond the Horizon: The Life of Twenty of the World's Most Remote Places

Roger Lovegrove OXFORD UNIV. PRESS 2015

In his profile of inaccessible islands, Roger Lovegrove's admiration for wildlife shines. But from Russia's ice-locked Wrangel Island, where polar bears banquet on walrus, to the Pacific Tuamotus, few such idylls remain pristine.