

► of modernization. Authentic modernity, Brook argues, is usually the conquest and transformation of a copy of somewhere else. From a historical perspective, “impersonation is often just a first step, not a final destination in a place’s development”. To illustrate this thesis, he traces the “idea of Dubai” back to the building of St Petersburg as a copy of Amsterdam, and later through Shanghai and Bombay (now Mumbai) as artificial iterations of English cities.

My experience of reading this book, however, would have been much happier without the introduction. In it, Brook, in my view, depicts sophisticated Chinese and Indian civilizations almost as if they were stunned hunter-gathers seeing iron tools for the first time: “to their Chinese and Indian inhabitants these strange new buildings and the cosmopolitan cities themselves were, by turns, confusing, threatening, and inspiring.” Likewise, Brook’s assertion that “the idea of Dubai ... is the idea of our time: the Asian Century, which is also the Urban Century” would make a good slogan for the side of an Emirates passenger jet; but I dread to think that a debt-ridden absolute monarchy exploiting foreign labour might be the shape of things to come.

Once past the clichés, the studies of St Petersburg, Shanghai and Bombay begin to grip (Dubai is too recent a phenomenon and fits awkwardly into the narrative structure). Brook describes how imposed modernity, combined with epic inequality, eventually triggered three-way struggles between the colonial or autocratic state, an aggressive and modernizing local bourgeoisie, and radical labour movements anchored in the new factories. Such conflicts, albeit occurring at great human cost, generated the extraordinary, if brief-lived energies of avant-garde Leningrad, Jazz Age Shanghai and Art Deco Bombay.

Will history repeat itself in a similar pattern in Dubai, Abu Dhabi, New Songdo or others of today’s instant cities? I think that such a question is equivalent to asking what time the revolution will begin in Las Vegas, the utopia of tack. Brook tends to confuse cosmopolitan modernity with malls, skyscrapers and theme parks, especially with the strange claim that “Dubai represents the world as it is”. Rather than searching to “catch the glimpses of utopia within the dystopia,” as he recommends, I think it would be more fruitful, as Geddes advised, to focus on the solidarities and practices of daily life. ■

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Ian McDiarmid plays the title role in Mark Ravenhill’s new translation.

ARTS

Reinventing Galileo

Philip Ball weighs up an exuberant Royal Shakespeare Company production of Bertolt Brecht’s *Life of Galileo*.

It is one of the central works of drama about science, and one of the most controversial. Bertolt Brecht’s *Life of Galileo* has been criticized for misrepresenting history, science and Galileo Galilei himself, with some validity. The real question, however, is whether the play works, theatrically and psychologically.

Shakespeare, after all, took vast liberties with history, yet such is his way with human portraiture that no one complains. Shakespeare and Galileo were born within a few weeks of each other in 1564 — a coincidence that the Royal Shakespeare Company (RSC) understandably makes much of for its latest production of Brecht’s play. More significantly, the play shows Brecht at his most Shakespearean, with Galileo the wily, tragically compromised sensualist redeemed by self-insight that others lack — he is, as Adam Gopnik suggested in a recent article in *The New Yorker*, a kind of intellectual Falstaff.

The exuberance and wit of this production owe much to the new translation by RSC writer-in-residence Mark Ravenhill. Ravenhill has commented on the “comic sensibility in Brecht’s language which I think [is] often overlooked”, but which he and director Roxana Sibert have found in abundance. In the title role, Ian McDiarmid is sly and worldly yet succeeds in pulling off the crucial feat of making Galileo loveable. It is with the basic fabric of the play, not its realization, that the questions lie.

In retrospect, we can see that Brecht set himself an impossible task, because even now

there is no consensus on Galileo. Many scientists still prefer the narrative that prevailed when Brecht first wrote the play in 1937–39, of a martyr

persecuted by the Catholic Church for his pursuit of truth about the arrangement of the cosmos. A more measured view now holds, recognizing that a less pugnacious man might have navigated the currents of the papal court more skilfully. It is certainly not to excuse the bullying, dogmatic church to point out that Galileo’s evidence for a heliocentric Universe was equivocal and in some respects (his interpretation of the tides) wrong.

Galileo’s mathematical approach, rightly adored by physicists today, was not, as some older science historians had it, the right way to do science. It was the right approach for celestial and terrestrial mechanics, but useless for chemistry, botany, zoology and much else. And although Einstein claimed that Galileo’s rejection of logical deduction devoid of empirical input was essential to modern science, that rejection did not begin with Galileo.

Brecht must take some blame for making Galileo seem more original than he was. He fell for the idea of a scientific revolution in which great men begin thinking in a totally new way. Complaints about historical accuracy could seem carping when appraising a work of art, but Brecht himself attested of the first version of the play that “I was trying here to follow history”. Brecht was in any case

A *Life of Galileo*

DIRECTED BY ROXANA SILBERT
Swan Theatre,
Stratford-upon-Avon,
UK.
Until 30 March 2013

disingenuous, because that original version was evidently informed by, and widely interpreted as a comment on, the political climate of the time. Brecht fled Nazi Germany after the Reichstag fire in 1933, and his cunning Galileo who subverts the ideology of the authorities — recanting on heliocentrism in order to continue his work in secret — was regarded as a symbol of anti-Nazi resistance.

That, however, is not the Galileo of the revised 1947 version — the one most often performed, and used here. Although Brecht was already reworking the play in 1944, the bombing of Hiroshima and Nagasaki transformed his view of scientists. “Overnight the biography of the founder of the new system of physics read differently,” he wrote. He felt that the Manhattan Project scientists had betrayed their moral obligations, and criticized even Einstein as a politically naive “eternal schoolboy”. Regardless of the merits of that view, it is the play’s downfall.

Now Galileo, confronting his former student Andrea, launches into a diatribe on how, by focusing on science for science’s sake, “you might jump for joy at some new achievement, only to be answered by a world shrieking in horror”. Nothing in Galileo’s former conduct has prepared this (anachronistic) concern about the social applications of science, leaving us with a confusing portrait.

On 30 October 1947, when the new version premiered, Brecht got a taste of Galileo’s ordeal: he testified before the US House Committee on Un-American Activities. He left for Europe the following day, accused of having compromised artistic freedom and with perhaps a keener appreciation that ideological interference in art and science is not confined to dictatorships.

Brecht’s other impossible task was to explain how science is done. He succumbs to the view that you just need to think clearly, believe your eyes and trust in reason. He then has to skirt around the problem that your eyes tell you that the Sun, not Earth, moves. What’s more, philosophers such as Paracelsus and Bernardino Telesio had been relying on experience, rather than on Aristotle, for a hundred years before Galileo, but had reached rather different ‘truths’. Nor was there any ‘scientific method’ in Galileo’s time, just as there is none today: the ad hoc combination of hypothesis, assumption, experiment, theory, logic and intuition will not reduce to any formula.

The RSC’s production is spirited and visually inventive. But the play itself is pulled between too many irreconcilable poles to make a coherent whole. It is perhaps the history of the play, rather than the text itself, that reveals the most about the difficult relationship between science and the cultures in which it is embedded. ■

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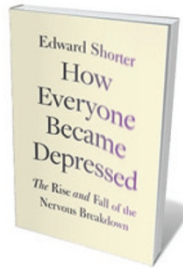
Books in brief



The Future: Six Drivers of Global Change

Al Gore RANDOM HOUSE 592 pp. \$30 (2013)

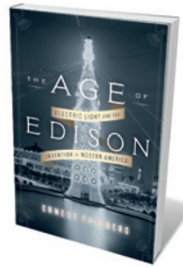
Seven years on from his climate-change documentary *An Inconvenient Truth*, Al Gore takes on six planetary paradigm shifts. The former US vice-president pulls few punches in analysing economic globalization, the balance of power, the Internet, population and resources, biotechnology and digitization, and environmental crises. The idea that Net-based “public squares” could add significantly to the democratic process may be optimistic. But Gore’s data synthesis impresses — as do his cogent critiques of scientific and political myopia, such as the corrosion of self-governance by market forces.



How Everyone Became Depressed: The Rise and Fall of the Nervous Breakdown

Edward Shorter OXFORD UNIVERSITY PRESS 272 pp. \$29.95 (2013)

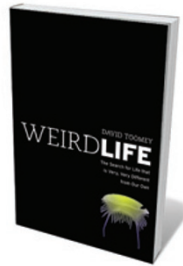
Historian of psychiatry Edward Shorter wonders at the disappearance of ‘nerves’ from psychiatry, arguing that today’s classification of mood disorders is deeply problematic. Data from the US National Center for Health Statistics for 2005–08, for instance, showed that more than 22% of US women were on antidepressants. To rationalize treatment, Shorter calls for a relabelling of major depression as “melancholia”, and more acuity in seeing that many ‘depressives’ actually suffer from whole-body nervous conditions.



The Age of Edison: Electric Light and the Invention of Modern America

Ernest Freeberg PENGUIN 368 pp. \$27.95 (2013)

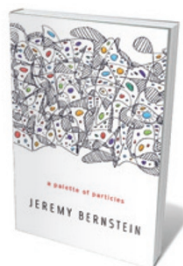
American geekery had a shining moment in 1879, when Thomas Edison unveiled the incandescent light bulb. The invention literally electrified the country, drawing rural residents to the bright lights of the burgeoning cities and illuminating surgeries, fairgrounds and more. But as Ernest Freeberg’s history shows, Edison was no lone genius: funding, patenting and a science-savvy public all played a part in his invention of modern research and development. As for the dazzling bulb, we are still grappling with its energy-guzzling ways.



Weird Life: The Search for Life That Is Very, Very Different from Our Own

David Toomey W. W. NORTON 288 pp. \$25.95 (2013)

At least 30 billion species have inhabited Earth, David Toomey tells us — each extraordinary in some way, like the extremophile bacteria that cluster at sea-floor vents. Yet all arose from a single ancestor. Toomey leads us into a speculative world of life outside that singular club. We visit the “shadow biosphere” of as-yet-only-imagined microbes posited by astrobiologists; the possibility of microbial life in Venusian clouds; doppelgangers in the multiverse; and much, much more. Weird indeed, and not a little wonderful.



A Palette of Particles

Jeremy Bernstein BELKNAP 224 pp. \$18.95 (2013)

Physicist Jeremy Bernstein pays homage to the subatomic, tinting particles according to era of discovery. So electrons, neutrons and neutrinos are assigned primary colours; the muons through to quarks, secondary colours; and the Higgs boson, neutrino cosmology and squarks, tachyons and the graviton, pastels. The abstractions come alive as Bernstein meshes history and science with anecdotes on everyone from Murray Gell-Mann to Richard Feynman. A colourful chronicle backed by 50 years in the field.