Clarke moved to London and worked for the Exchequer and Audit Department. During the Second World War, he gained experience in electronic engineering while building and testing ground-controlled radar in the Royal Air Force — later dramatized in his sole non-science-fiction novel, *Glide Path* (1963).

In 1945, Clarke inadvertently launched a career as a futurologist with his outline for a geostationary communications satellite. In a letter ('V2 for ionosphere research?') published in February's issue of *Wireless World* and inspired by the German V2 rockets then landing on London, he made a revolutionary proposal:

> An 'artificial satellite' at the correct distance from the earth would make one revolution every 24 hours; i.e., it would remain stationary above the same spot and would be within optical range of nearly half the earth's surface. Three repeater stations, 120 degrees apart in the correct orbit, could give television and microwave coverage to the entire planet.

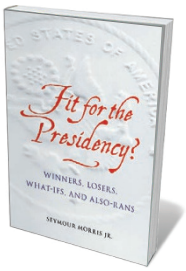
Clarke realistically concluded: "I'm afraid this isn't going to be of the slightest use to our postwar planners, but I think it is the *ultimate* solution to the problem." He followed up with a more detailed piece in *Wireless World* that October, envisioning "space-stations" that relied on thermionic valves serviced by an onboard crew supplied by atomic-powered rockets.

SPACE GODFATHER

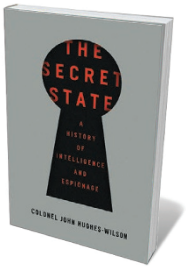
The first commercial communications satellite, Telstar I, was built by Bell Telephone Laboratories and launched in 1962. The first to be geostationary, the Hughes Aircraft Company's Intelsat I ('Early Bird'), went up in 1965. Both launched on conventional rockets, and operated with transistors and without human maintenance. The two US engineers chiefly responsible — John Pierce for Telstar and Harold Rosen for Intelsat — saw Clarke as the father of satellite communications. Richard Colino, director-general of Intelsat (the International Telecommunications Satellite Organization) agreed in his foreword to a collection of Clarke's technical writings, *Ascent to Orbit* (1984). Clarke preferred "godfather", noting with uncharacteristic modesty in the book that he had received "rather more of the credit, I suspect, than I really deserve". In old age, however, he told me that his comsat article was "the most important thing I ever wrote".

Clarke consolidated his wartime hands-on training with a degree in mathematics and physics at King's College London, graduating in 1948. In 1950 he published the non-fiction book *Interplanetary Flight*, which he claimed was the first English-language study offering "the basic theory of space travel ▶

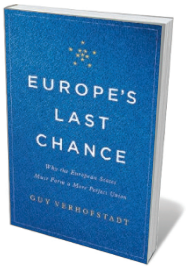
Books in brief



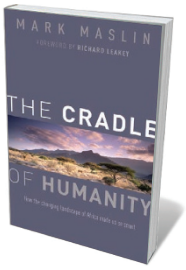
Fit for the Presidency?: Winners, Losers, What-Ifs, and Also-Rans
Seymour Morris Jr POTOMAC *(2017)*
Former pollster Seymour Morris Jr runs a political-science thought experiment by scrutinizing the curricula vitae of 15 US presidential hopefuls from 1789 to 1980. 'Shoo-in' DeWitt Clinton, a naturalist and statesman, lost to James Madison in 1812. Abraham Lincoln looked unqualified, yet unusual work experience (including navigating the treacherous Mississippi River) endowed him with the pragmatism needed to win the American Civil War. Morris reminds that sterling qualities make good presidents, but they must be the right qualities — and voters must be capable of recognizing them.



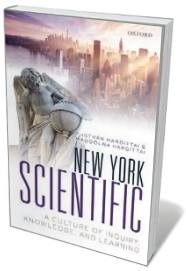
The Secret State: A History of Intelligence and Espionage
John Hughes-Wilson PEGASUS *(2017)*
From the *cursus publicus* (imperial communications network) of ancient Rome to cybersurveillance, espionage is as old as war. In this sweeping history, John Hughes-Wilson anatomizes the intelligence process and the evolution of covert methodologies and technologies that maintain (or disrupt) geopolitical balance. Nineteenth-century German spymaster Wilhelm Stieber, for instance, sparked the paranoia that led in part to the First World War. Hughes-Wilson also masterfully summarizes the workings of terrorism and cyberwar. A deft tour of the shadow side of 'speaking truth to power'.



Europe's Last Chance
Guy Verhofstadt BASIC *(2017)*
Terrorist attacks, tangled economics, tsunamis of refugees — the European Union faces a perfect storm, with added turbulence from nationalism. Here, Guy Verhofstadt — leader of the European Parliament's liberal faction — argues that the political solution is a US-style federation of member states. He offers an insider's view, not least of prevailing issues such as Europe's toothless responses to Middle Eastern conflict and Russian belligerence. His hypothetical "United States of Europe", predicated on early efforts towards an EU, is both hugely ambitious and highly plausible.



The Cradle of Humanity
Mark Maslin OXFORD UNIVERSITY PRESS *(2017)*
Palaeoclimatologist Mark Maslin delves into deep time to trace humanity's rise to geological hegemony. Examining early hominin finds in East Africa, he spotlights three stages (bipedalism in *Australophithecus*, a jump in brain size in *Homo erectus* and *Homo sapiens*' arrival some 195,000 years ago) and the roles of climate change, celestial mechanics and plate tectonics in their emergence. Ultimately, he theorizes that 'climate pulses' in the Rift Valley, in which hyper-arid conditions alternated with the formation of vast lakes, helped to drive the evolution of the big hominin brain.



New York Scientific: A Culture of Inquiry, Knowledge, and Learning
Istvan Hargittai and Magdolna Hargittai OXFORD UNIVERSITY PRESS *(2016)*
New York may blaze with neon, but many of the city's byways shine with scientific brilliance — if you know where to look. Chemists Istvan Hargittai and Magdolna Hargittai map the territory for this quirkily comprehensive guide to key landmarks and institutions. There are scores here, from the Nobel obelisk to gems of the city's "biotechnology corridor" (such as the Rockefeller University, where Oswald Avery isolated DNA), the home of African American inventor Lewis Latimer and monuments galore. **Barbara Kiser**