

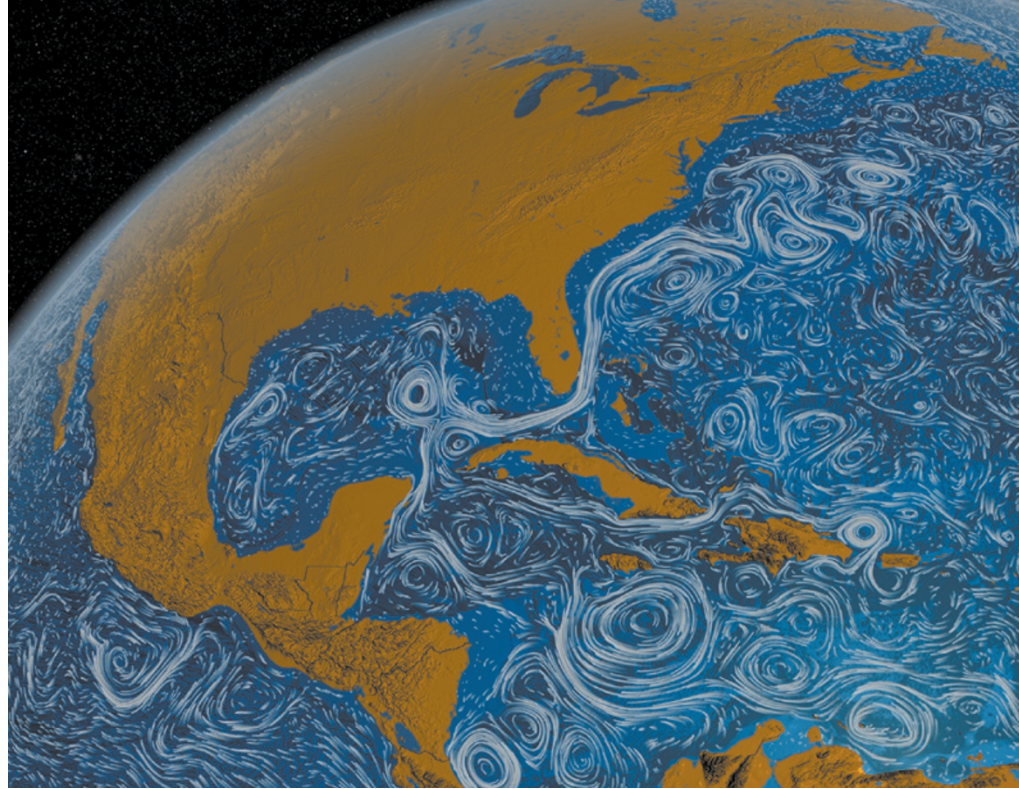
► popular with cool-climate Neanderthals occupying the mountain ranges of Eurasia.

Certain regions loom large in *The Improbable Primate* as launch pads for nature's experiments in human evolution: northeast Africa and Arabia (dubbed "Middle Earth", but free of Hobbits), the mountain chains of mainland Asia and the continental shelves of southeast Asia, exposed when sea levels fell during each ice age. In this largely descriptive account of human biogeography, Finlayson paints with a broad brush. Defying convention, he lumps all hominins in the past 1.8 million years into a single species, *Homo sapiens*. This will be too large a lump for most palaeoanthropologists (and me) to swallow. But his focus on hominin lineages — rather than individual species — has some merit, given that genetic evidence has arisen in recent years of ancient admixture between early modern humans, Neanderthals and Denisovans, and of gene flow into Denisovans from an unknown archaic hominin.

An admirable feature of Finlayson's hypothesis is its amenability to scientific testing. Further empirical data from fossils, artefacts and environmental records will certainly be valuable, as might a more nuanced treatment of individual sites. I would have welcomed more information about the chronology of these sites (which number more than 400), and the processes of burial, weathering and preservation that affected them over time. Sites close to water and in caves can be overrepresented in surveys, because their preservation potential is often higher than that of desert sites.

Ecological models are another avenue worth exploring. Mathematical models that examine foraging patterns and responses to habitat fragmentation in space and time, and simulations of alternative hypothetical scenarios, can help to illuminate what may have happened in the past. Such models could indicate which combinations of factors were likely to have had the greatest effect on hominin evolution. Multiple selective pressures have been in play over the past 7 million years and across the six inhabited continents, so untangling these interactions will be no easy task. *The Improbable Primate* provides a useful starting point for this next great challenge. ■

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Ocean currents swirl and eddy in a visualization of NASA satellite data, on show at the British Library.

#### INFOGRAPHICS

# Truth is beauty

Daniel Cressey views the British Library's first science exhibition — a celebration of scientific illustration.

Isaac Newton may have long presided over the British Library in the form of Eduardo Palaozzi's vast sculpture at the library's entrance, but only now is the London institution hosting its first science exhibition. *Beautiful Science* catalogues attempts to make sense of the world through visualizations from the seventeenth century to today, drawing on the vast archives of the United Kingdom's national library. On show are graphics from alchemist Robert Fludd's 1617 work *Great Chain of Being* — which attempts to explain the Universe from stars to animals, vegetables and minerals — to a huge collection of modern Circos diagrams used to visualize genetic information and highlight relationships between species.

"Infographics are now a staple of every newspaper in the country. In many ways this seems like a new phenomenon," says curator Johanna Kieniewicz. "What I was really keen to show is that it actually has a very interesting and rich history."

The graphics have a many-layered power. "The visual representation of science can increase both the engagement of fellow researchers [and] the public," says Kieniewicz.

Perhaps the exhibition's most famous expression of this is *Nightingale's Rose*, from the 1850s. A pioneer of modern medicine, Florence Nightingale demonstrated the value of improved hospital hygiene by showing that during the Crimean War, more British soldiers died as a result of poor sanitation in hospital than from enemy action. The image she drew to illustrate this point, says Kieniewicz, has "changed science, changed the way in which things are done".

Less transformative but no less impressive is William Farr's failed 1848–49 attempt to determine the cause of a cholera epidemic. His huge *Temperature and Mortality of London* plots these two variables in circular graphs. Farr's contemporary, John Snow, was more successful in using epidemiological mapping to pin cholera down as a waterborne disease; yet Farr's diagram stands as a monument to the difficulties of trying to tease causation out of huge data sets. Farr eventually came around to Snow's views, in part thanks to Snow's data presentation.

*Beautiful Science* shows that good data presentation is timeless. Witness Luke Howard, the meteorologist who named the

**Beautiful Science: Picturing Data, Inspiring Insight**  
British Library, London.  
Until 26 May 2014.

➔ **NATURE.COM**  
For a video about the exhibition, see:  
[go.nature.com/cvy8r9](http://go.nature.com/cvy8r9)

## Books in brief



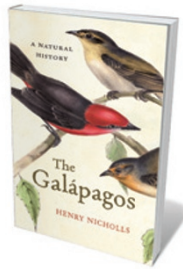
### **Governing Marine Protected Areas: Resilience through Diversity** *Peter J. S. Jones* ROUTLEDGE (2014)

Marine Protected Areas, or MPAs — ocean zones limiting human activity — cover little more than 2% of the world's oceans, despite an internationally agreed target of 10% by 2020. And thousands of those that do exist are little more than 'paper parks', many scientists have found. Entering these choppy waters is geographer Peter Jones, who shows, through some 20 case studies, how and how not to govern MPAs effectively. Jones compellingly concludes that a diversity of incentives, from economic to social, is as essential as the diversity of the ecosystems MPAs are designed to protect.



### **Visions of Science: Books and Readers at the Dawn of the Victorian Age** *James Secord* OXFORD UNIVERSITY PRESS (2014)

Angst over scientific literacy is nothing new, notes James Secord. The political unease and religious turmoil in early Victorian Britain prompted John Herschel and fellow scientific utopians to urge a corrective: the dissemination of 'useful', or scientific, knowledge across society. As Secord shows, access to texts such as Charles Babbage's searing 1830 *Reflections on the Decline of Science in England* helped to foment an intellectual revolution in step with those in industry and modern science.



### **The Galapagos** *Henry Nicholls* PROFILE BOOKS (2014)

From the plangent cries of blue-footed boobies to the splash of swimming iguanas, the Galapagos islands remain pristine — but for how long? In this natural and human history of Darwin's living laboratory, Henry Nicholls surfs from geology, oceanography and marine biology to resident land species, not least the burgeoning population of *Homo sapiens*. Throughout, he intertwines key accounts such as Darwin's inspired musings on geological uplift and the piscine encounters of pioneer diver William Beebe. One for the scientific isomane with a sense of the bigger picture.



### **The Rise of Superman: Decoding the Science of Ultimate Human Performance** *Steven Kotler* NEW HARVEST (2014)

In extreme athletics, 'redefining the possible' is happening at an unprecedented rate. In this high-octane study, Steven Kotler explores 'flow', a neurochemically rich state in which cognitive and physiological processes mesh. The stupendous physical feats of the late ski-base jumper Shane McConkey and others are riveting. Equally surprising is what we know of flow science, such as how the brain's superior frontal gyrus deactivates to speed decision-making — and how 'bliss addiction' can result from too much exposure to flow states.



### **A Garden of Marvels: How We Discovered That Flowers Have Sex, Leaves Eat Air, and Other Secrets of Plants** *Ruth Kassinger* WILLIAM MORROW (2014)

After 'murdering' a kumquat tree through hard pruning, Ruth Kassinger set out to understand plant physiology through the history of botany. In this scientific wonderland, we encounter Robert Hooke's exquisite drawings of plant structure in *Micrographia* (1665); arsenic-gobbling brake ferns; and the single eukaryote that, 1.6 billion years ago, engulfed a cyanobacterium and spawned the multitude of chloroplasts that made life on Earth possible. **Barbara Kiser**

NASA/SVS

three basic cloud types — cirrus, cumulus and stratus. His diagram of the weather recorded in 1815 at his home in Tottenham, north London, sits next to a strikingly similar display of weather data from 2011. The latter is given a modern twist through an overlay of social-media commentary by design firm Clever Franke of Utrecht, the Netherlands.

As science generated more complicated data, the methods needed to visualize them also became more complicated. Evolutionary theorist Jean-Baptiste Lamarck's 1809 table of the relationships between mammals, fish, reptiles, crustaceans and other animals can be understood easily by anyone with the most basic knowledge of French; much more parsing is needed for an avian tree of life published in *Nature* in 2012 that sits next to it. The exhibition reveals how seriously scientists need to take data presentation to convey meaning. Most of the pieces displayed were arduously plotted and coloured by hand. Says Kieniewicz of today's spreadsheet tools for chart production: "They make it too easy. You don't end up putting much thought into graphs."

Modern scientists, although liberated from painstaking drafting and shading, can gain from thinking hard about their audience, and about precisely what and how they want to communicate. A graph in a research paper today could be at the British Library in years hence, forming part of what Kieniewicz calls scientists' "visual legacy".

Science, the exhibition reminds us, is all about beautiful ideas. The trick is finding the aesthetic that maintains both meaning and elegance. ■

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