

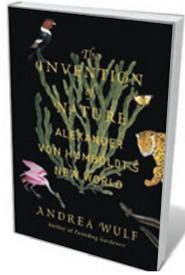
mentor: Mary Somerville, the translator of French astronomer Pierre-Simon Laplace and author of the groundbreaking popular study *On The Connexion of the Physical Sciences* (1834). Somerville demonstrated that women could make their mark in science (R. Holmes *Nature* **514**, 432–433; 2014). It was she who introduced Lovelace to Babbage at one of his champagne-and-science receptions in Marylebone, London, where Charles Darwin, astronomer John Herschel and geologist Charles Lyell were frequent guests. At these soirées, Babbage displayed a model of his early difference engine — a brass calculating machine capable of tabulating higher-order polynomial functions — alongside a silver automaton in the form of a dancing ballerina. Most guests were drawn to the ballerina; Lovelace, Babbage noticed, was entranced by the gleaming cogs of the calculating machine. Thus the unlikely friendship began.

When Ada married William King, later Earl of Lovelace, in 1835, her London town house brought her even closer to Babbage. Their mathematical correspondence, both serious and teasing, focused on the analytical engine and the possibilities of mathematical and symbolic calculation. Thus in 1840 Lovelace was discussing the elimination game *solitaire*, in which 26 marbles must ‘jump’ each other, in an apparently unpredictable sequence, until only one remains. She challenged Babbage to consider whether there could be “a mathematical formula ... on which the solution depends, and which can be put into symbolical language”. She added, “Am I too imaginative for you? I think not.”

By 1841 Lovelace was developing a concept of “Poetical Science”, in which scientific logic would be driven by imagination, “the Discovering faculty, pre-eminently. It is that which penetrates into the unseen worlds around us, the worlds of Science.” She saw mathematics metaphysically, as “the language of the unseen relations between things”; but added that to apply it, “we must be able to fully appreciate, to feel, to seize, the unseen, the unconscious”. She also saw that Babbage’s mathematics needed more imaginative presentation. So when a scientific paper on the analytical engine was published by Italian engineer Luigi Menabrea, Lovelace (perhaps inspired by Somerville’s translation of Laplace) translated it from the original French. A delighted Babbage encouraged her to add a commentary. When published in the British journal *Scientific Memoirs* (volume 3, October 1843), Lovelace’s ‘translator’s Notes’ had expanded to twice the length of Menabrea’s paper, and were much more far-reaching. This is the work that eventually made both the engine and Lovelace famous. ▶

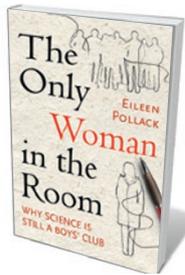
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Books in brief



The Invention of Nature: Alexander von Humboldt's New World
Andrea Wulf KNOPF (2015)

Alexander von Humboldt (1769–1859) electrified fellow polymaths such as Johann Wolfgang von Goethe, discovered climate zones and grasped the impact of industrialization on nature. In her coruscating account, historian Andrea Wulf reveals an indefatigable adept of close observation with a gift for the long view, as happy running a series of 4,000 experiments on the galvanic response as he was exploring brutal terrain in Latin America. Most presciently, and at a time of fragmenting disciplines, he saw life as a “net-like intricate fabric” and brilliantly synthesized the sciences in his grand treatise *Cosmos*.



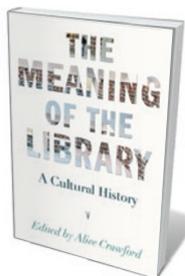
The Only Woman in the Room: Why Science Is Still a Boys' Club
Eileen Pollack BEACON (2015)

In the 1970s, Eileen Pollack was one of the first women to earn a bachelor’s degree in physics at Yale University in New Haven, Connecticut. Isolated and unencouraged, she abandoned dreams of a life in cosmology and turned to writing. In this investigative memoir, Pollack uses her own experience and interviews with students and academics as a lens on gender and science. Many will wince in sympathy over the biases and sexism that made Pollack’s academic career a salmon run to nowhere, yet despite ongoing inequalities in physics, she senses hopeful shifts in awareness.



Weatherland: Writers and Artists Under English Skies
Alexandra Harris THAMES & HUDSON (2015)

This is a gorgeous piece of writing, sure to grip bibliophiles and the meteorologically inclined alike. Scouring English art and literature for references to weatherscapes, Alexandra Harris has magicked them into a subtle meditation on the nation’s changeable culture. Snippets of science intersperse discussions of Shakespeare’s tempestuous dramas, the “gothic fogs” of Charles Dickens’s 1853 *Bleak House*, the rain-soaked revelations of poet Ted Hughes and more. Harris captures the evanescent interplay of mind and sky, just as climate change could muddy that relationship out of all recognition.



The Meaning of the Library: A Cultural History
Editor Alice Crawford PRINCETON UNIVERSITY PRESS (2015)

The current pressures on libraries give a poignant edge to this chronicle, edited by research librarian Alice Crawford, which offers rarefied glimpses of the institution through time. Historian Andrew Pettegree reveals that printing contributed to the Renaissance library’s decline; academic librarian Robert Darnton relates how eighteenth-century booksellers went through hell and high mountain passes to transport their wares; and English-literature professor Laura Marcus surveys libraries in films such as Alain Resnais’s 1956 *All the Memories of the World* and Orson Welles’ 1941 *Citizen Kane*.



Waste to Wealth: The Circular Economy Advantage
Peter Lacy and Jakob Rutqvist PALGRAVE MACMILLAN (2015)

In this crisply lucid primer on the innovative sustainable-business model called the circular economy, Peter Lacy and Jakob Rutqvist make a business case for repurposing wasted resources, life cycles and embedded values such as unrecovered energy. They sketch in the historical background; discuss worked examples of business models such as the circular supply chain; describe the creation of “circular advantage”; and map out strategies for making the shift to full sustainability. *Barbara Kiser*