



Moby-Dick author Herman Melville.

▶ literary immortality is concerned. His allusive style chimed with a new century of discovery, and twentieth-century experimentalists of literature such as D. H. Lawrence and Virginia Woolf reappraised him as a modernist who lived before modernism was invented.

Melville's masterpiece also resonates powerfully with today's scientific concerns. *Moby-Dick* contrasts the glory of the whale with the threats posed by humanity. Melville even seems to anticipate the effects of a changing environment. In the moving chapter 'Does The Whale's Magnitude Diminish? — Will He Perish?', Melville wonders about a flooded future, but sees the whale as triumphant, spouting "his frothed defiance to the skies". Yet by the time his book finally came into its own, Melville's vision had turned into a nightmare for the whale.

In 1961 alone, more whales died — nearly 75,000 — than in the entire span of Yankee whaling. With faster ships and grenade harpoons, new species had come within the hunters' remit: the blue and fin whales of the South Atlantic and Southern Ocean. And, like Scoresby, the "hip-booted cetologists" (as D. Graham Burnett describes them in his *The Sounding of the Whale: Science and Cetaceans in the Twentieth Century*, University of Chicago Press, 2012), entered a complicit arrangement with the modern whaling industry to inform their conclusions on whale anatomy, breeding and migration. It is telling, perhaps, that no one has written a follow-up to *Moby-Dick* to celebrate that particular adventure. ■

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INNOVATION

Motley inventors

John Browning welcomes a collective portrait of creators that puts life stories first.

An enthusiast's book about enthusiasts, *The Tinkerers* surveys a motley collection of US innovators whose creations are changing the world — or so their makers hope. The result is a kaleidoscopic view of the myriad forms innovation can take.

Alec Foegen's book is a useful contribution to understanding our era, repeatedly transformed by innovation that has generated pages and gigabytes of analysis in the abstract, but surprisingly little on the inventors themselves. Foegen redresses the balance, covering a crew that ranges from Thomas Edison to Silicon Valley whizz-kids. He tries to let his inventors describe in their own words what they thought they were doing, and why.

Dean Kamen, inventor of the Segway and various medical devices, falls closest to the mould set by Edison. Based in New Hampshire, he has used the cash flow from licensing his automatic syringe, dialysis machine and other medical innovations to invent solutions to whatever takes his fancy — such as a wheelchair that can navigate steps. Saul Griffith puts a more modern spin on the model. His "do tank", Squid Labs in Alameda, California, spins off companies rather than licences — including Howtoons, a website featuring educational cartoons, and Makani Power, which uses airborne wind turbines to harvest the energy of high-altitude winds.

Meanwhile, Nathan Myhrvold, Microsoft's former head of technology, takes new models of innovation to a logical extreme. Instead of creating his own inventions, his company, Intellectual Ventures, buys, finances and creates a large patent portfolio, which it then licenses to others. He argues that this inspires a broad swathe of creativity. Some, in turn, argue that it encourages a profusion of patents and could merely mire innovation in legal uncertainties and lawsuits.

Foegen doesn't provide any solutions, or even take a strong stance in that debate. For better or worse, *The Tinkerers* feels like a prototype — a bit rough and ready, created as much to point towards interesting questions as to provide answers. To be truly representative, the choice of profiles should at least have included some innovators in biology or medical science, and some working in corporate laboratories. But the hotchpotch does capture a range of approaches and motivations. Kamen seems to like solving problems. Griffith wants to create a greener, smarter world. And although he contributed to the

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underpinnings of Microsoft Windows, Myhrvold now sees his role in promoting innovation as largely financial and legal.

Foegen's approach contrasts with the

books on innovation that take the 'grand theory of creativity' route, knocking the sharp edges off individual histories to fit them in. Steven Johnson's *Where Good Ideas Come From* (Riverhead, 2010) fits inspiration into seven categories, including hunches and happy accidents. Clayton Christensen's *The Innovator's Dilemma* (Harvard Business School Press, 1997) divvies up the world of innovation according to its impact on business strategy. Fascinating though such books often are, this abstract point of view was more valuable 50 years ago than today.

Then, innovation was managed. Much of it happened in government-funded set-ups such as Bell Labs and DARPA (the US Defense Advanced Research Projects Agency), or at big corporate-funded labs like IBM and Dow Chemical. President Dwight D. Eisenhower, in his 1961 farewell address, worried that "a government contract becomes virtually a substitute for intellectual curiosity". And so powerful were the managers of that funding that he followed his warning about the military-industrial complex with another about the "scientific-technological elite".

Nearly 30 years ago, Steven Levy's book *Hackers* (Anchor/Doubleday, 1984) inspired a generation with the idea that ideas born of subversion are often more powerful than those blessed by management. Today, innovation is popping up all over the place: garages; 'hack-spaces'; bedrooms. Nobody is managing the process. So everybody's story matters.

Few of those stories have yet been told, making those that have the exceptions. One example, Walter Isaacson's biography of Steve Jobs, sparked a global debate about how to manage innovation grounded in life rather than theory. But the exceptions should become the rule. Innovators' histories need to be written. For all its flaws, Foegen's book is a step in the right direction. ■

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