



## TECHNOLOGY

# Rise of the e-book

**Carl Zimmer** charts the boom in electronic publishing and what that spells for wood pulp and ink.

In the summer of 2010, on a tiny island off the coast of Maine, I saw the future of books. I had been invited to teach a writing course at Shoals Marine Laboratory on Appledore Island, a beautiful bulge of rock covered in scrub and herring-gull nests. During a break at the beach with my family, my wife finished reading her book with typical supersonic speed. She craved another, so decided to experiment with her new iPhone.

She tapped the screen. In seconds, an e-book had streamed invisibly through the air into her hand. Swiping her thumb like a windshield wiper, she soon finished it. She tapped the screen for another. Out of the ether, another e-book appeared.

Now I see, I thought. Everything was in place for a revolution in how we read and write. And the pace of that revolution has surpassed my expectations. Since Apple launched its iBooks application in April 2010, some 180 million books have

been downloaded. Analysts estimate that Amazon will have sold 314 million e-books for the Kindle in 2011 alone. The radical change extends far beyond sales volume: the e-book ecosystem allows writers to reach readers in ways that did not exist before.

Before that moment on Appledore, I was an e-book sceptic. In the 1990s, I got sick of all the promises that the age of e-books was almost upon us — which tended to come from people who wanted you to pay US\$1,000 to come to their ultra-exclusive publishing seminars. When the dot-com bubble popped, the e-book prophets and their pricey seminars disappeared.

It would take another decade for e-books to grow into something more than hype.

People became accustomed to reading on screens. The Kindle, iPad and other tablets made the

experience comfortable and portable. Yet the technology alone did not change how people read. They needed something to read. The first online books, offered by pioneering websites such as Project Gutenberg, were typically the bare-bones text of old books that were already in the public domain. Publishers are now pouring their new books and backlists into e-book stores.

This e-book ecosystem has profoundly changed how we can read books. Volumes that were once out of reach are now wonderfully close. I recently wanted to read *The Hand, Its Mechanism and Vital Endowments as Evincing Design*, written in 1833 by the Scottish anatomist Charles Bell. A few years ago, the only way for me to get my hands on the book would be to go to a university library and hunt it down in the stacks. I did not have to leave my chair to download a free copy from Google Books to my phone, in fully searchable form.

E-books are also changing the experience of writing books. Not long ago, writers had to funnel their books through publishing companies. Now a writer can simply upload a manuscript to websites such as Smashwords, Lulu and Amazon. It can go on sale as an e-book in a matter of hours.

## A NEW GENRE

Freed of old constraints, e-books can take on new forms. A writer would never propose a 30-page book to a traditional publisher. Yet many authors are now experimenting with this miniature genre. Some are participating in a programme recently launched by Amazon, called Kindle Singles, to promote these pieces. Writers can also take advantage of the computer power of tablets. One excellent example is *Before the Swarm*, an e-book published earlier this year by The Atavist, a small publishing house. The book is a profile of entomologist Mark Moffett by writer Nicholas Griffin. You can read *Before the Swarm* as a straight profile, or you can tap the screen to reveal what The Atavist calls ‘inline extras’ — digital footnotes that present audio recordings, video and information such as the definition of the Schmidt Sting Pain Index.

Other science e-books have metamorphosed so far that they are barely books at all. *The Elements* is an app for the iPad that presents a collection of images and information for every entry in the periodic table. *Journey to the Exoplanets*, from *Scientific American* and Farrar, Straus and Giroux (both owned by the same parent company as *Nature*), is a combination of text, sumptuous paintings, photographs from space probes, an explorable Solar System and experiments children can run themselves.

E-books not only allow for new experiments, they also make it possible for writers to reach niche audiences. If an acarologist wants to publish a book about the ticks ▶

► NATURE.COM

Carl Zimmer learns  
to love science films:  
[go.nature.com/geo44i](http://go.nature.com/geo44i)

► of New England, he or she does not have to persuade a publisher that it will sell well enough to justify the cost of editing, designing, printing and shipping it. The author can just upload the book themselves.

For some writers, the economics of e-books are attractive. A traditional publisher typically pays the author a royalty of 10–20% on the sale of each book. The sale of international rights can bring more income — but only after an author's royalties rise above the advance. Although e-book distributors such as Amazon or Smashwords won't offer an advance, their royalty arrangements are usually much more favourable. Depending on the e-book publisher, royalties can range from 30–70%.

Of course, it is also true that 70% of zero is zero. A common illusion among writers is that as soon as they finish a book, the world at large suddenly becomes aware of it and millions of copies just sell themselves. In fact, it is easy for a book to vanish into oblivion, and it becomes all the more easy as the number of book titles published each year goes up. Traditional publishers may have their flaws, but they also know how to distribute and publicize books. If writers want to self-publish, they have to take on all the things that publishers do. And today, mastering the art of book publicity is tricky. Many newspapers are shutting down their book-review sections. Discussions about new books are migrating instead to blogs and social media such as Facebook and Twitter.

The format of the e-book itself should also be a cause for concern for authors. Even the most successful e-book campaign simply pushes data from one computer to another. No physical object ends up sitting on a shelf. The longevity of e-books remains uncertain, depending as it does on the technology for reading them. When I look at some of the most elaborate e-books, I hear a ghostly voice whispering, "CD-ROM". In the early 1990s, compact discs were all the rage — you could fit an entire encyclopedia on a single disc.

For a fleeting moment, CD-ROMs were the future of books. If I had decided to abandon print books and publish my books only on CD-ROMs, I would have imprisoned them in obscurity. Sneer at printed books if you will, but you can't deny that their operating system will never expire. ■

**Carl Zimmer** is the author of ten books about science, including two e-books: *Brain Cuttings* and *More Brain Cuttings*. e-mail: mail@carlzimmer.com



A food-lab creation: pistachio mousse impregnated with roasted white chocolate.

#### FOOD SCIENCE

## With pipette and ladle

From stretchy ice cream to wire-brushed crackling, **Harold McGee** digests an eclectic modernist menu.

In 1988, the Oxford physicist Nicholas Kurti and his wife Giana published an anthology about food and drink by fellows of the UK Royal Society. When he sent me a copy of *But the Crackling is Superb*, he inscribed it: "An unashamed frivolity!"

The title was a self-deprecating joke, a prominent French chef's polite reaction to an experimental pork roast of Kurti's. Cooking and eating were not respectable academic subjects in those days, so the whole enterprise had the fresh, recreational air of scientists on holiday. The book is still great fun to browse.

Times have changed. Last year, Harvard University in Massachusetts had to turn away hundreds of students from a course on the soft-matter science of cooking. This spring saw the publication of the six-volume treatise on food science and technology in the professional kitchen, *Modernist Cuisine* (The Cooking Lab, 2011). And now we have the serious and substantive anthology *The Kitchen as Laboratory*, edited by food scientists César Vega, Job Ubbink and Erik van der Linden.

Most of the book's 33 chapters are by scientists at universities and food companies, and there is much of interest to cooks and food lovers. The most engaging chapters — the ones that made me feel like getting into the kitchen to experiment — illuminate the making of particular foods and go on to suggest improvements and new twists on them.

In a playful nod to Kurti's anthology (cited by the editors as an inspiration) and to his work in low-temperature physics, *Modernist Cuisine* co-authors



**The Kitchen as Laboratory:**  
Reflections on the  
Science of Food  
and Cooking  
EDITED BY CÉSAR  
VEGA, JOB UBBINK  
AND ERIK VAN DER  
LINDEN  
*Columbia University*  
Press: 2012.  
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\$29.95/£19.95

Christopher Young and Nathan Myhrvold describe how to achieve the ultimate crackle in duck skin. The keys: a wire pet brush, a water bath and a block of dry ice.

Vega's chapter on soft-cooked egg yolk is a model of clarity and consideration. He demonstrates that yolk viscosity increases with holding time at around 60 °C, gives a chart to help obtain the texture desired, and a table for translating Pascal-seconds of viscosity into the consistency of mayonnaise, honey or Marmite.

Chemist Martin Lersch surveys the flavour- and colour-forming Maillard reactions, and reports that chopped onions brown faster and get sweeter when fried if you raise their pH with sodium bicarbonate. Alas, he resorts to the most old-fashioned cook's measure, specifying a "pinch" of soda per onion and, confusingly, per half an onion. My evidently oversized pinch browned my onions faster, but gave them a distinctly unpleasant flavour.

Physicist Thomas Vilgis explains how xanthan gum, a readily available bacterial polysaccharide, thickens ketchup and other foods without cooking. He gives a simple recipe that uses it to hold diced vegetables together in a tart. John R. Mitchell, a food