images, published by Nitze in 1894, were just a cloudy mix of light and shade, one can see why he was pleased with the "objective representation of reality" in his images.

In Germany, such archives would be possible in various university cities beyond Berlin. Jena, Halle, Tübingen and Erlangen, for instance, all hold unique stocks from archaeology to zoology. Plugging these collections into a network of similar existing or soon-to-be established institutions in Cambridge, Leiden, London, Paris and Boston, Massachusetts, would be a great boon to the study of material culture in the history of the sciences, medicine and the humanities.

A pilot project in Berlin would need a large building with, say, four floors measuring 1,000 square metres each. Converting an existing building would probably cost around €15 million (about US$21 million); a new building would cost double that. Another €1 million a year would be necessary to maintain the building, with a team of at least 15 professionals to run the archive. All this would have to be provided by a joint venture of top research-funding organizations, such as the Deutsche Forschungsgemeinschaft (DFG), the Fritz Thyssen Foundation and the Volkswagen Foundation. Experience at the Boerhaave and the Whipple museums shows that the job may take as little as three to five years.

At the same time, there needs be an impulse to implement research with objects on a wider scale. A good path to take here, aside from linking object archives with related university departments and institutes, would be to establish or engage associated graduate schools, which would encourage multidisciplinary work on and with objects. Structures developed successfully at the Berlin Max Planck Institute for the History of Science could serve as a model. Its research-network project in the history of scientific objects, which ran from 2005 until 2010, linked 18 scholars worldwide. The institute also recruited 15 pre- and postdocs to participate in an eight-week 'wandering seminar' on scientific objects in 2006, touring through substantial museums and collections within Europe. The seminar produced essays, an exhibition, a conference and an informative website (go.nature.com/4farzv).

The first step towards realizing this ambitious overhaul of Germany's hidden collections will require the universities and the research-funding organizations to discuss setting up one or more pilot projects. If these can be funded, the universities will need to act quickly to develop workable concepts — otherwise, their holdings might be lost to research for ever. ■

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# Books in brief

The Sorcerer's Apprentices
A Season at elBulli
lisa abend

**The Sorcerer's Apprentices: A Season at elBulli**
*Lisa Abend* Simon and Schuster *304 pp. £18.99 (2011)*
Similar to star scientists, top chefs are an exacting breed. So what is it like to work in the kitchen of the restaurant voted as the world's best for three years in a row? In a behind-the-scenes peek, Lisa Abend relates her experience of enrolling in chef Ferran Adrià's culinary laboratory at his restaurant elBulli in Catalonia, Spain. Abend describes how she adapted to the innovative and technological cooking techniques, and how she and other apprentices learned to push themselves to the extreme of their abilities in order to achieve perfection night after night.

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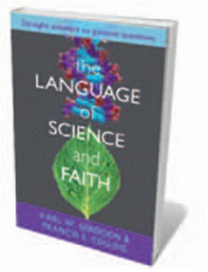

**The Language of Science and Faith: Straight Answers to Genuine Questions**
*Karl Giberson & Francis Collins* SPCK Publishing *224 pp. £12.99 (2011)*
For scientists who hold religious beliefs, it can be hard to disentangle the two world views. Geneticist Francis Collins follows on from his 2006 best-seller *The Language of God* (Free Press), in which he reconciled his scientific knowledge with his Christian faith, joining with physicist Karl Giberson to answer questions about Charles Darwin, evolution and the age of Earth and the Universe. Pointing out that the Bible is not a scientific text, they aim to satisfy the spiritual mainstream while challenging atheists and creationists.

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David Edgerton
Britain's War Machine

**Britain's War Machine: Weapons, Resources and Experts in the Second World War**
*David Edgerton* Allen Lane *464 pp. £25 (2011)*
By putting resources, machines and experts at the centre of a global story of the Second World War, historian of science David Edgerton paints a different picture of British military success in the mid-twentieth century. Far from being the plucky underdog, the wealthy nation was a great power at the heart of a global production system. Strategic in its thinking about technology, and ruthless in the pursuit of its interests with formidable arms, Britain's victory was ultimately a cheap one, Edgerton argues.

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CHINNOVATION
Yinglan Tan
How Chinese Innovators are Changing the World

**Chinnovation: How Chinese Innovators are Changing the World**
*Yinglan Tan* Wiley *288 pp. £19.99 (2011)*
It is often said that China makes products but does not invent them. Business professor Yinglan Tan dispels that myth through case studies of Chinese companies that are leading the way in entrepreneurship. Businesses in technology-related fields are overcoming barriers to innovation, scaling up rental networks of hybrid cars nationwide or offering user-led travel and restaurant guide websites. He discusses harnessing resources, navigating legal restrictions, dealing with risk and the attraction and retention of talent in China.

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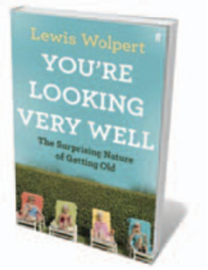

**You're Looking Very Well: The Surprising Nature of Getting Old**
*Lewis Wolpert* Faber and Faber *256 pp. £14.99 (2011)*
Considering it is something we must all endure, most of us know remarkably little about ageing. In researching his book, developmental biologist and octogenarian Lewis Wolpert admits that much of it came as a surprise even to him. He explores the implications of an ageing population, explains why we age through cellular wear and tear and examines attitudes to death and euthanasia. He also raises concerns that we are not doing enough to plan for our old age, either individually or as a society.

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COURTESY OF CREATIVE DIFFERENCES

Werner Herzog charts the emergence of a new human sensibility 35 millennia ago in his latest film.

# Q&A Werner Herzog

# Illuminating the dark

*As he releases a 3D documentary about the prehistoric paintings in Chauvet Cave in southern France, Werner Herzog — the German director of* Fitzcarraldo *and* Grizzly Man *— talks about cave art and the hostility of nature.*

**What drew you to cave art?**

It dates back to my adolescence. I come from a remote mountain valley where we had no telephone, no radio, no running water. A book in a bookstore caught my attention. I was mesmerized by a prehistoric picture of a horse — perhaps from Lascaux Cave. I was always interested in archaeology because of my grandfather, an archaeologist who did his life's work on a Greek island close to the Turkish coast. He excavated a huge site that includes temples and a medical spa where ancient doctors would work. When the chance came to film in Chauvet Cave I was immediately on board.

**Why is Chauvet special?**

Some of the most wonderful caves with prehistoric art, such as Lascaux in the Dordogne in France and Altamira in the Spanish Pyrenees, have had to shut because of problems with mould. Chauvet, in the Ardèche in France, was preserved as the perfect time capsule. Owing to the collapse of the face of the gorge, the cave entrance was sealed for roughly 20,000 years. And when the cave was discovered in 1994, the explorers did everything right. They rolled out plastic sheets and crawled along them to avoid stepping on the floor. They found the tracks of cave bears, which had been extinct for tens of thousands of years. And the charcoal remains of fires made to illuminate the paintings. One swipe mark of a torch on the wall was radiocarbon dated to nearly 30,000 years ago. The paintings themselves date from 30,000 to 35,000 years ago.

**What do the paintings show?**

The bestiary is limited and mysterious. The animals depicted range from reindeer to woolly mammoths, woolly rhino, lions, bison — huge, dangerous, powerful beasts, and not only animals that you would hunt. There is no sign of a fox, weasel or bird, except one scratched image of an owl. Painting never got any better through the ages, not in ancient Greek and Roman antiquity, nor during the Renaissance. It's not like the Flintstones — the work of crude men carrying clubs. This is the modern human soul emerging vigorously, almost in an explosive event. You sense the presence of the artists because it's so fresh: we felt that eyes were looking at us from the dark.

**What do we know about the cave artists?**

For the time, they were high-tech. An ice-free corridor would have connected Chauvet to the Swabian Alb, 400 kilometres away in southern Germany, where flint tools and bone and ivory flutes have been found. The cave was never inhabited, although there were burials in the region. Strangely, Chauvet people only painted deep inside the cave, where it was completely dark. Some archaeologists claim the pictures have ritualistic or shamanistic meanings. But we simply do not know.

**The Cave of Forgotten Dreams (3D)**
DIRECTED BY WERNER HERZOG
*Now showing at US/UK cinemas*

**What were the filming challenges?**

We were allowed one week of shooting, but just four hours per day. We had to move along a metal walkway. No more than three camera people, sound or 3D specialists could assist me, and we had to use lightweight equipment that did not emit any heat. It was tough: 3D apparatus is large and clumsy, and must be reconfigured for each type of shot. When the camera moves closer to an object, the lenses have to move towards each other and 'squint'. We had to do these high-tech things in semi-darkness with only a few torches.

**Was filming in 3D worth the trouble?**

It was. The formation of the cave is very dramatic. There are bulges and niches and pendants, which the artists also utilized in their drama. For example, a huge bulge in the rock now is the bulging neck of a charging bison; a horse comes out shyly from the recesses of a niche. When you see the film you know immediately that it was the right thing to do. Otherwise, I'm sceptical of 3D.

**You've said you see nature as hostile and chaotic. Why?**

I've heard too many times that there's a cosmic harmony. This vapid new-age babble enrages me. The Universe is not harmonious and beautiful, it is dangerous and hostile. My opinion is evident in *Grizzly Man*, for example, which is about a man who went out to Alaska to protect grizzly bears by standing a couple of metres away from them. Even our supposedly benign Sun is a danger — hundreds of thousands of simultaneous atomic explosions. Imagine how destructive a black hole would be. Yet the more we know, the more fascinating it gets. There's an inherent curiosity in the human race to understand the Universe that's around us. That distinguishes us from the cow in the field. ■

**INTERVIEW BY JASCHA HOFFMAN**

**CORRECTION**

The Books in Brief summary of *The Sorcerer's Apprentices* by Lisa Abend (*Nature* **471,** 577; 2011) wrongly suggested that she underwent training as a chef; in fact, she observed training.

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