

horses roam. Others were accidental, such as the wild-mustang preserves of the American West. She reports on recent research supporting the notion that large animals are more than simply appealing — they can be major engineers of their ecosystems. Big predators such as the wolves of Yellowstone prevent herbivores from munching plant populations into oblivion and keep a lid on smaller predators. Big herbivores like the musk oxen of Greenland stop forests and weeds from overrunning the earth. They fertilize with their dung, and turn the earth with their big hooves.

Levy notes that many of the surrogates that conservationists use are the domesticated descendants of wild creatures. Specially bred cattle are used as proxies for extinct aurochs, the giant wild cattle that once roamed Europe, but Levy says that the modern cattle pale in comparison. Real aurochs — the kind painted by our ancestors in caves — were “longer of leg, bigger of brain, more graceful and fearless than their domesticated brethren”, she speculates.

The slightly mournful lesson of the book is this: any large animals we add to landscapes must be carefully managed. For example, condors reintroduced in the United States wear radio collars; wild mustangs are rounded up by the US government, dividing family groups and leaving excess animals held in pens. What differentiates such animals from pets?

To be truly wild, according to Levy, animals must have their numbers controlled by wild predators, not by humans. They must also live with fear. “The threat of a hungry carnivore lurking at the water hole is the essence of the truly wild horse,” she writes. And yet the idea of reintroducing predators — the key to wildness — is the most difficult to sell to local peoples around the world. Conservationists might love the thought of introducing African lions to the Great Plains in a bid to fill the gap left by the extinct American lion, but ranchers and rural residents understandably have qualms.

“We cannot raise the auroch, but its tamed descendent may yet fill a vital ecological niche,” concludes Levy in her examination of the increasing use of domestic cattle in conservation projects. Where once there were mammoths clashing tusks, giant short-faced kangaroos and woolly rhinoceroses, we now have Bessie the cow, grazing and fertilizing the soil and raising her head in vague interest as cars whizz past. It is one way of plugging the megafauna gap, but I long for the grandeur and strangeness of those lost giants. ■

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Books in brief



On Being: A Scientist's Exploration of the Great Questions of Existence

Peter Atkins OXFORD UNIVERSITY PRESS 152 pp. \$19.95 (2011)

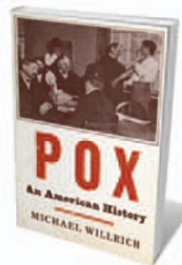
Why are we here? Chemist and author Peter Atkins answers this big question succinctly and elegantly in this slim volume. Following in the footsteps of rationalists such as Richard Dawkins, he argues that we should find as much awe in the workings of science as we might in any god. Although he acknowledges the role of spiritual beliefs in society and the comfort they can bring to some, he finds greater solace in the scientific underpinnings of origins and endings, birth and death.



Naked Genes: Reinventing the Human in the Molecular Age

Helga Nowotny and Giuseppe Testa MIT PRESS 192 pp. £18.95 (2011)

Advances in the life sciences have revealed many previously hidden aspects of biology, from the genes and proteins within cells to the developmental stages of the fetus. European Research Council president Helga Nowotny and stem-cell scientist Giuseppe Testa argue that these building blocks are not valueless, but are ‘naked’ blank canvasses that take on multiple meanings in different social contexts, from court rooms to parliaments. They assess how these varied perspectives influence attitudes to biotechnology in topics such as assisted reproduction and personalized medicine.



Pox: An American History (Penguin History of American Life)

Michael Willrich PENGUIN PRESS 400 pp. \$27.95 (2011)

Attitudes to public-health interventions have not changed much in the past 100 years, explains historian Michael Willrich. He describes how measures at the turn of the last century to stem the spread of a smallpox epidemic in the United States — using quarantines, pesthouses and ‘virus squads’ — were met with suspicion and popular resistance despite their success. A well-organized anti-vaccination movement sprang up to champion personal choice over powerful government, resulting in the disputed political landscape around inoculation that is familiar today.



Beyond the Finite: The Sublime in Art and Science

Edited by Roald Hoffmann and Iain Boyd Whyte OXFORD UNIVERSITY PRESS 208 pp. \$24.95 (2011)

How should we depict protein folding or negative mass? Scientists must create new imagery to describe such natural concepts every day, and in that sense they have a lot in common with artists who attempt to display the sublime. Nine scholars of science and art convey their perspectives in this volume. From the beauty of images taken by the Hubble Space Telescope to quantum romanticism, the contributors touch on natural aesthetics in physics, neuroscience, chemistry, painting and music.



Bird Watch: A Survey of Planet Earth's Changing Ecosystems

Martin Walters UNIVERSITY OF CHICAGO PRESS 256 pp. \$45 (2011)

Bird populations worldwide are threatened by climate change and environmental destruction. This illustrated survey, produced in cooperation with the global conservation partnership BirdLife International, documents all 1,227 endangered bird species on the Red List of the International Union for Conservation of Nature. Region by region, the book describes the birds' habitats and the environmental pressures on them, as well as charting conservation efforts and top birding sites around the globe.