

contact, appease or exploit the spirits.

Clottes provides an overview of some of the varied beliefs and practices that he has researched, observed or been told about on visits to sites in Africa, Asia, Australasia and the Americas. He sees these “multiple realities” as part of the broad spectrum of spirituality focused in the landscape and nature. He shares his own experiences of fascinating but brief encounters with indigenous guides, such as Clifford, a venerated medicine man of the Native American Ute people. When they visited a rock-art site in Utah, a female big-horn sheep appeared. Clottes describes how Clifford chanted and made tobacco offerings, and how he later said that the sheep was “the spirit of the site” and suggested that the spot would be good for “vision-questing”.

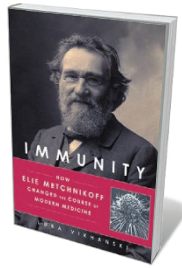
Finally, Clottes shows how such anthropological insights enrich our ability to question the Palaeolithic record and construct interpretations of behaviours, actions and events in the deep past with a better-informed historical imagination. His view is that knowledge of present and historical rock-art practices can be the key to interpreting the past. Older, less rigorous applications of this thinking were rejected for being simplistic. Clottes’s approach is more cautious, and he readily admits that the significance of many more-recent rock-art sites may be unknown or reinterpreted by modern aboriginal descendants.

Some readers will wonder whether it is right to view the varied social behaviours that resulted in drawing, painting and sculpture solely through the lens of belief. Others may question a search for universal traits that brings together eclectic cross-cultural similarities in spiritual practice that are fascinating but not necessarily helpful. Above all, Palaeolithic art is the first visible sign of modern human consciousness, of self-awareness, complex language, the use of metaphor and symbol, a sense of beauty, minds powered by brains like our own. Clottes offers little thought on how we might research these aspects of our deep history and what makes us human. But as neuroscience advances, this must surely be the next step.

This is a thought-provoking book about complex societies that endeavoured to understand the world in their own various ways. For anyone interested in Ice Age art, Clottes’s enthusiasm cannot fail to energize, inspire and provide caution to their own investigations. ■

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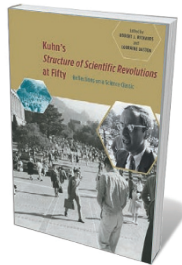
Books in brief



Immunity: How Elie Metchnikoff Changed the Course of Modern Medicine

Luba Vikhanski CHICAGO REVIEW PRESS (2016)

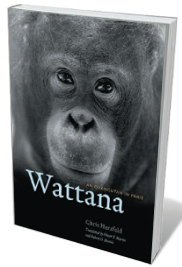
In 1882, Russian zoologist Elie Metchnikoff discovered the mechanics of natural immunity while experimenting on starfish larvae. Physician Jules Rochard called his theory an “oriental fairy tale”, yet it won Metchnikoff a share in a Nobel prize decades later. As journalist Luba Vikhanski reveals in this engrossing scientific biography, the gifted Metchnikoff’s breakthroughs extended to invertebrate embryology, treatments for syphilis and pioneering research on some of today’s hottest topics in biology: the microbiome, probiotics and longevity.



Kuhn's Structure of Scientific Revolutions at Fifty

Edited by Robert J. Richards and Lorraine Daston UNIVERSITY OF CHICAGO PRESS (2016)

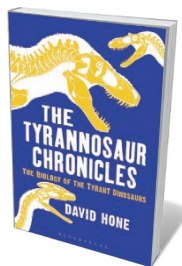
Five books leave a wake like physicist-turned-historian Thomas Kuhn’s *The Structure of Scientific Revolutions* (University of Chicago Press, 1962; see D. Kaiser *Nature* **484**, 164–166; 2012). These essays on that classic, edited by science historians Robert Richards and Lorraine Daston, emanate from a 2012 commemorative conference. It’s a scholarly treat, from George Reisch probing the cold-war roots of Kuhn’s provocations on dogma, to David Kaiser tracing the experimental psychology in his philosophical claims.



Wattana: An Orangutan in Paris

Chris Herzfeld, translated by Oliver Y. Martin and Robert D. Martin UNIVERSITY OF CHICAGO PRESS (2016)

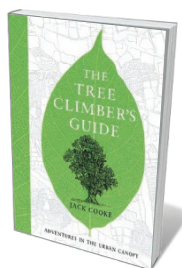
For this thoughtful, unusual study of the human–ape ‘interface’, philosopher of science Chris Herzfeld focuses on a captive orang-utan, one of less than 1,000 worldwide. Zoo-born Wattana, given string, cloth and paper at the Jardin des Plantes menagerie in Paris, made elaborate knots and ‘necklaces’ — a skilful use of fibre unsurprising in a tree-dwelling primate that builds complex nests, yet so far seen only in captivity. A trove of gripping research, somewhat marred by its scattershot presentation.



The Tyrannosaur Chronicles: The Biology of the Tyrant Dinosaurs

David Hone BLOOMSBURY SIGMA (2016)

Weighing some 6 tonnes and sporting ranks of formidable serrated teeth, the tyrannosaur has bitten into the human imagination like no other creature from the Cretaceous period ending 66 million years ago. Luckily for its devotees, the fevered pace of palaeontology means that findings on 30 or so species of tyrant dinosaur are piling up fast. Ecologist David Hone’s primer lays out the facts and educated guesses, from the beasts’ near-global distribution to their taxonomy, anatomy, reproduction, behaviour and spectacular looks, possibly enhanced by a “mosaic” of scales, feathers and keratin folds.



The Tree Climber's Guide: Adventures in the Urban Canopy

Jack Cooke HARPERCOLLINS (2016)

Nature writing has focused mainly on the terrestrial, and sometimes the marine. With Jack Cooke’s guide, it just got arboreal. An ebullient tree-climber, evoking the hominin connection to canopy life even as he mourns humanity’s lack of “biaxial ball-and-socket wrist joints”, Cooke exults in the sensory thrill of being aloft. But his tour of London’s trees, from cedar of Lebanon to common lime, is less about racing to the top than remapping the city to reconnect us with the extraordinary worlds above our heads. **Barbara Kiser**