

The knight anole (*Anolis equestris*), with its large head and toe pads, is adapted to live high in forest canopies.

evolutionary duplication is inevitable.

And how are we to predict these convergences? Losos resurrects palaeontologist Dale Russell's fantastic "dinosauroid" of the 1980s, a conception of what would have happened if bipedal, carnivorous dinosaurs with large brains and grasping hands had been selected for, had the asteroid not struck (Russell accepted the asteroid hypothesis). This three-fingered creature with a huge brain, a beak and chicken feet seems to have inspired the aliens in the 1980s science-fiction television series *V*, but scientists were uninspired.

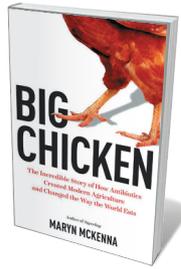
Evolutionary biologist Stephen Jay Gould wondered about the unique, fragile fauna of the Cambrian period (541 million to 485 million years ago) in his 1989 book *Wonderful Life* (W. W. Norton). Had the period's chordates — which included the ancestors of vertebrates — become extinct, we wouldn't exist. But as Losos points out, it's not a fair comparison: you're not replaying the tape, but running a different one.

The idea of contingency is perhaps best based on palaeontologist Dolf Seilacher's theory of constructional morphology. In this, features such as the elephant's trunk or the osprey's habit of catching fish with claws rather than beak result from three factors: adaptation (the selective component), evolutionary history (organisms must work with what they've inherited) and construction (how the material properties of living structures empower and constrain their form). From there, history takes over. Evolution is not a preordained, inevitable narrative. Neither is it a crapshoot, with random particulars disporting themselves until something works. Rather, it is like the game Monopoly. Where you go next is in part determined by where you are now; who you are is where you've been (your acquisitions); where you can go is determined by the throw of the dice, with limited possibilities and probabilities.

In staggeringly clear and engaging prose, Losos shows us remarkable vignettes of scientists working at personal and professional risk in all sorts of habitats — field, lab and museum — to elucidate stunning mechanisms of evolution (such as rapid adaptation in evolutionary biologist Richard Lenski's experimental strains of *Escherichia coli* bacteria). He is one of the premier writers in biology today: his book is my first choice to anchor a stimulating evolutionary biology seminar. ■

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Books in brief



Big Chicken

Maryn McKenna NATIONAL GEOGRAPHIC (2017)

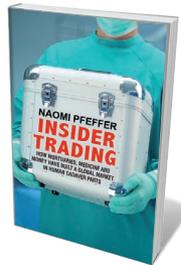
This superb scientific exposé by journalist Maryn McKenna skewers the use of growth-promoting antibiotics in chicken feed. The practice has left much US supermarket chicken laced with antibiotic-resistant bacteria; globally, such microbes cause 700,000 human deaths each year. McKenna tracks the method's rise from the 1940s, a harrowing story punctuated by disease outbreaks and regulatory laxity. More recently, she shows, a trend to ban antibiotic use and instead re-engineer the poultry-farm environment could, given the dominance of chicken, transform the global "meat economy".



The Sky Below: A True Story of Summits, Space, and Speed

Scott Parazynski with Susy Flory LITTLE A (2017)

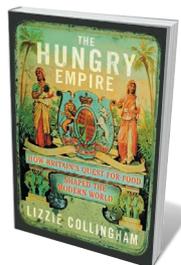
"I'm walking like Frankenstein on crack, but it's the best I've got." Thus writes astronaut and physician Scott Parazynski on climbing Everest with severe back pain, brought on by exposure to zero gravity. A veteran of five space missions, seven spacewalks and a stint as space pioneer John Glenn's personal medic, Parazynski is as disarmingly down-to-earth as he is heroically stoic. You're with him every minute in this hair-raising memoir, as he wrangles with wayward tethers outside the space station Mir, "sutures" a solar array to the International Space Station or gazes at the glittering tapestry of stars from Earth orbit.



Insider Trading

Naomi Pfeffer YALE UNIVERSITY PRESS (2017)

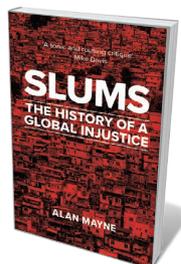
Organs for transplantation comprise only a fraction of the potential 'harvest' yielded by a human corpse. In this pacy, detailed chronicle, Naomi Pfeffer reveals how hundreds of products are traded in US and UK markets, from skin for dressing leg ulcers (plastic-packed "like American cheese") to the ground bone mixed into fixative for prosthetic limbs. Focusing on corneas, pituitary glands and skin, Pfeffer unravels the tangled ethics of this mortuary-fuelled industry, which has evolved over a century of medical experimentation and advances in extracting and preserving "cadaver stuff".



The Hungry Empire

Lizzie Collingham BODLEY HEAD (2017)

Beyond gold and glory, an insatiable lust for foreign foods drove the juggernaut of British imperialism. So shows Lizzie Collingham in this rich economic history, drawing on annals military, mercantile and domestic to reveal the complex routes along which the fruits of colonial fields and fisheries were shunted to Britain's dining rooms. The 500-year journey begins with the role of Newfoundland salt cod ("poor John") in Tudor exploration, and progresses through imperial tales of class and cruelty by way of Jamaican rum, African rice and alarming dishes such as iguana curry and roasted opossum.



Slums: The History of a Global Injustice

Alan Mayne REAKTION (2017)

A billion people live in the shadow cities we call slums. Alan Mayne's trenchant social history traces how perception of them shifted. Victorians saw them as labyrinths or vortices — "topsy-turvy" realms of otherness. Today, they are more likely to be viewed as resilient hubs of innovation. Yet developers' war on slums has seen no ceasefire. It's hard to refute Mayne's estimation: "We invent them to explain to ourselves the ugly traits, the logical incongruities and the social inequalities of modern capitalist cities." **Barbara Kiser**