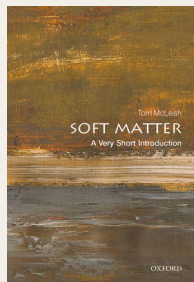


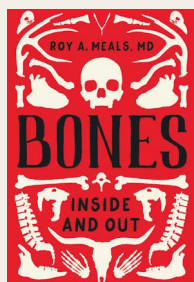
## Books in brief



### Soft Matter

Tom McLeish *Oxford Univ. Press* (2020)

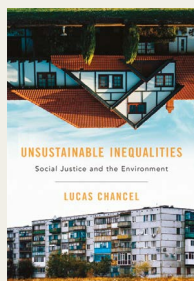
Freeze a rose in liquid nitrogen then tap it with a hammer, and the petals shatter. “Its softness is a function of its temperature, not just its molecular constituents and structure,” observes theoretical physicist Tom McLeish, one of the researchers who founded ‘soft-matter physics’ in the 1990s. The field covers milkiness, sliminess and pearliness in colloids, polymers, liquid crystals, membranes, foams, granular materials, glasses and gels, and draws on chemistry and biology. This short introduction is fascinating, if unusually challenging.



### Bones

Roy A. Meals *W. W. Norton* (2020)

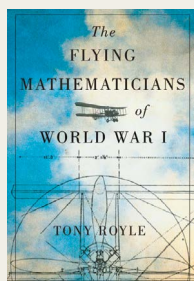
Bone is a marvel: light-weight, durable, responsive to changing conditions and self-repairing. But “hardly anybody has ever seen or wants to see living bone, especially their own”, writes orthopaedic surgeon Roy Meals in his revealing, sometimes riveting and finely illustrated investigation, ranging from the dinosaurs to today. Hence, perhaps, the confusion over how many bones humans have: although 206 is the widely accepted figure, it actually varies from person to person. Even the number of ribs can differ, from 24 to 26.



### Unsustainable Inequalities

Lucas Chancel (transl. Malcolm DeBevoise) *Harvard Univ. Press* (2020)

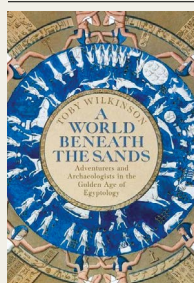
When the United States announced its withdrawal from the 2015 Paris climate agreement, its president claimed to be protecting US miners’ jobs. How, asks Paris-based economist Lucas Chancel, can the environment be protected while fighting poverty and inequality? His brief and moderately hopeful global analysis mentions Sweden, where poor households get assistance to replace obsolete heating equipment, and Indonesia, which swapped large fossil-fuel subsidies for “a vast program of social protection aimed at reducing inequalities”.



### The Flying Mathematicians of World War I

Tony Royle *McGill-Queen's Univ. Press* (2020)

The First World War was crucial to the development of UK aeronautics. Who better to tell the story than an ex-Royal Air Force pilot who is a trained mathematician, a dedicated historian and a lively writer: Tony Royle. His compelling book is inspired by academics who became pilots, such as physicist Frederick Lindemann — later scientific adviser to Winston Churchill — who experimented with putting an aircraft into a deliberate spin, calculating the effects and then stabilizing it. Lindemann’s courage launched a standard spin-recovery procedure.



### A World Beneath the Sands

Toby Wilkinson *Picador* (2020)

Two anniversaries approach: of the deciphering of Egyptian hieroglyphs in 1822 and the discovery of Tutankhamun’s tomb in 1922. Egyptologist Toby Wilkinson’s book addresses the intervening century, when Western archaeologists and imperialists scrambled to excavate ancient Egypt’s civilization and procure treasures for collections abroad. He tells the story well, with attention to both scholarship and scandal. After 1922, he says, “in embracing scientific rigour, Egyptology would lose its panache”. **Andrew Robinson**

Spirit and Opportunity resulted in discoveries about specific rocks, dunes or other Martian landforms as seen by many instruments. The first approach yields encyclopedic knowledge in chunks; the second produces more of a synthesis of understanding about a particular landscape.

Seen through this lens, these missions offer lessons for teams more generally. Consider data sharing. Vertesi argues that the Mars mission embraced the concept of open data not just because it was a taxpayer-funded mission — the usual explanation — but because its flat, collectivist organization required it. Meanwhile, on Cassini, the leader of the camera team ended up in a cycle of distrust with other scientists when she attempted to maintain control over images from her group.

Unsurprisingly, Vertesi notes that institutional sexism probably had a role in the camera leader’s difficulties (one project scientist said he would make her “mud-wrestle” a male researcher to resolve an issue). Other women did rise to positions of power in the Cassini mission, but mainly towards the end of the spacecraft’s life. It was acceptable for women to run an existing mission, not a new one. Happily, this is changing: planetary scientist Elizabeth Turtle is leading NASA’s upcoming Dragonfly mission to Titan.

Other lessons involve the challenge of managing people who don’t all work in the same place — particularly acute in the age of COVID-19 and videoconferencing. Although mission control provides an organizational hub, many team scientists work remotely from their home institutions. They jostle for position from a distance — something all too familiar now. The Cassini team overcame the challenges of working across borders and time zones by nurturing a virtual sense of community, with photographs of teleconference participants on the wall (shades of endless Zoom calls to come). This gave overseas scientists access to a groundbreaking mission, and gave NASA researchers access to top talent worldwide.

Such take-home messages might be useful for collaborations getting off the ground. Vertesi notes that tech start-ups tend to favour the Mars-like flattened hierarchy around one charismatic leader. Bigger institutions, such as universities juggling the interests of departments and disciplines, often use a Cassini-like matrix.

In the end, science from both missions flowed directly from the people involved. No matter how the lakes on Titan shimmer, or what the mineralogy of a particular Martian rock turns out to be, it was the people behind the spacecraft, keyboards and endless teleconferences that drove what these interplanetary robots discovered. I’m glad to have come to know them even better through this book.

**Alexandra Witze** is a correspondent for *Nature* based in Boulder, Colorado.