

the wind from Austria brought rain to the Hungarian plain, and alpine snows fed the lands of the Danube, so each region was shown to provide some climatic essential that an adjoining one lacked.

These ideas infused society. They were picked up by economists including Emanuel Herrmann, who took climatology as a model for spatial analysis of the imperial economy. That concept, in turn, was developed by liberals such as the social democrat Karl Renner, who argued that diversity actually created unity, and that trade grew through exchange of excess goods between regions. Implicitly and explicitly, climatic interdependencies served as the foundation for political and economic oneness in a jostling, polyglot empire.

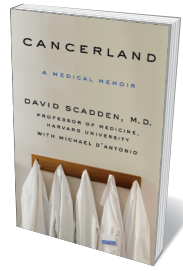
There was a closely linked emphasis on climate at different scales, micro to macro. Local topography and hydrography produce climates in areas ranging from a few kilometres to vast continental spans, and much of the work of climatology involves integrating these varied zones. But the focus on scale was driven by that overarching social, economic and political need for unity.

First, researchers studied conditions on very small scales, to satisfy local economic needs and political aspirations. These were then integrated into a larger imperial framework, especially in the data and maps of the huge, multi-volume series *Climatography of Austria*, published between 1904 and 1919 — a vastly more detailed descendant of German polymath Alexander von Humboldt's 1845 treatise *Cosmos*. Here, politics, rather than interfering, provided a rationale for doing a certain kind of science: descriptive, dynamic and focused on interdependence. That research was the seedbed of modern climatology. After the empire collapsed in 1918, catastrophically weakened by the First World War, the discipline was carried forward in Germany, Russia, Austria, Britain and North America.

There is a great deal more to this complex and reflective study. Coen examines how the empire promoted the popularization of science by leading experts while supporting research on the grand scale — an approach that stressed the patriotic, economic, cultural, even recreational utility of science. But the fact that climatology was born of a context of politics and policy, and was never far from them during its development, merits exactly this sort of examination as we wrestle with the ramifications of climate science today. ■

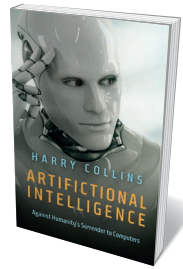
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Books in brief



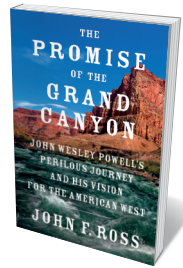
Cancerland: A Medical Memoir

David Scadden with Michael D'Antonio THOMAS DUNNE (2018)
Cancer is a foreign country with different norms, asserts David Scadden in this gripping medical memoir. A leading immunologist and oncologist, Scadden (with writer Michael D'Antonio) examines the disease's recent history through interconnected lenses. Patients' often harrowing experiences twine through the narrative on research and treatments, from chemotherapy, bone-marrow transplants and lumpectomies to CRISPR and immunotherapies. Scadden's own eventful life in the lab (not least, his co-founding of the Harvard Stem Cell Institute in Cambridge, Massachusetts) is a highlight.



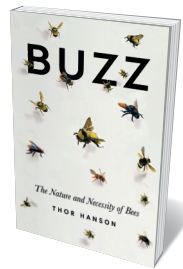
Artificial Intelligence

Harry Collins POLITY (2018)
Sociologist of science Harry Collins has long focused on gravitational-wave physics (see *Nature* 542, 28–29; 2017). Here, he shifts gears dramatically to examine pervasive existential fears over artificial intelligence and its perceived threat in the 'deep learning' era. Collins probes this idea trenchantly and in considerable detail. Pointing to computers' inability to factor in social context, master natural language use well enough to pass a severe Turing test, or wield embodied cognition, he argues that the real danger we face is not a takeover by superior computers, but slavery to stupid ones.



The Promise of the Grand Canyon

John F. Ross VIKING (2018)
In 1869, US geologist John Wesley Powell was the first to explore the Grand Canyon and its environs scientifically in an intrepid river descent. Historian John Ross shows how, beyond the derring-do, Powell championed sustainable resource use and was a key architect of federal science. As head of the US Geological Survey, he created an important ecological map charting water scarcity in the West that aimed (but failed) to temper congressional dreams of manifest destiny. He even foresaw the 1930s Dust Bowl crisis. A bold study of an eco-visionary at a watershed moment in US history.



Buzz: The Nature and Necessity of Bees

Thor Hanson ICON (2018)
For this natural history of the bee, biologist Thor Hanson wings far beyond the hive to explore bee species from "bumbles" to wool carders. Here are the proto-bee of 125 million years ago, evolved from a Cretaceous wasp ancestor; a Chilean desert bee of the genus *Geodiscelis*, with a grotesquely elongated tongue; and a bumblebee colony's haphazard array of tiny wax pots. Here, too, are the data on dwindling populations. Apiology, Hanson reminds us, is not just about the scientific buzz: bee behaviour has shed light on human issues from addiction to collective decision-making.



A Honeybee Heart Has Five Openings

Helen Jukes SCRIBNER (2018)
Joining the bright tide of cultural responses to all things apian (see *Nature* 521, 29–30; 2015) is this subtly wrought personal journey into the art and science of beekeeping. Helen Jukes evokes both the practical minutiae of the work, and the findings of researchers who have illuminated bee ethology over the centuries, from François Huber to Eva Crane. Laced through are quietly lyrical musings over 'hive life' that see Jukes perceiving her colony variously as a "brain with a million synapses", an inner citadel built by master architects or the fount of an only partly decoded language. [Barbara Kiser](#)