A Tunisian soldier at a demonstration against the government in January 2011. The army had refused to fire on protestors earlier that month.

HUMAN BEHAVIOUR

Guns and roses

Anne Harrington savours Robert Sapolsky's tome on humanity's vacillations.

Robert Sapolsky's students must love him. In *Behave*, the primatologist, neurologist and science communicator writes like a teacher: witty, erudite and passionate about clear communication. You feel like a lucky auditor in a fast-paced undergraduate course, where the implications of fascinating scientific findings are illuminated through topical stories and pop-culture allusions.

But *Behave* has also been written to a serious moral end. Sapolsky is seeking to understand why, as a species, humans can ruthlessly pull a trigger or compassionately touch an arm. In this sense, the book joins a genre of evolutionarily inflected works that, since at least the 1960s, have struggled to decide what we are. Are we killer apes burdened by incorrigible instincts towards aggression, or are we as much defined by our capacity for compassion and peaceful resolution of conflict? Sapolsky seeks to move beyond polarizing debate, because it is clear to him that we are both.

Sapolsky's is a biological project at heart. He takes the customary swipe at any social scientist who might believe that humans are born blank slates. But he also has a stern word for the "molecular fundamentalist" who has no

time for the allegedly soft findings of the social sciences. Biology matters; so does the cultural and social context within which behaviours unfold. To understand humans at our best and worst, we need the insights of neuroscience, endocrinology, primatology, developmental biology, evolutionary theory, clinical psychology and social psychology. We also — more pointedly — need to understand how they are all "utterly intertwined".

Given the importance that Sapolsky attaches to context and culture, I was disappointed that he did not engage more with the varied tribes of scholars — historians, anthropologists, scholars of religion and more — who might not be scientists, but who study these things for a living. Maybe he thinks they are just not interested in playing ball. He contends that at least some "weren't thrilled" by the discovery that species such as chimpanzees have a certain kind of culture,

Behave: The Biology of Humans at Our Best and Worst
ROBERT M. SAPOLSKY
Penguin: 2017.

and says that they emphasize human-centric definitions to cut out "chimps and other hoi polloi". He notes that such scholars are also engaged in contentious debates of their own with "postmodernists" that he declines to follow. Rather than wade into their quagmire, he opts instead for an "intuitive" definition of culture favoured by primatologist Frans de Waal: "How we do and think about things, transmitted by nongenetic means." It seems like a missed opportunity. What have the humanities' debates and struggles to do justice to human culture been all about? Are we so certain that they have nothing to offer Sapolsky's great project?

At 700-plus pages excluding notes, *Behave* is in a sense two books. The first part is a rich survey of behavioural biology: developmental processes in the brain, the logic of evolutionary theory, the adolescent brain. Then Sapolsky reaches for the bigger, synthetic pay-offs, examining how, together, these insights can enhance our understanding of the forces that lead to tribalism, violence, dehumanization and war — as well as tolerance, empathy and peace. Symbols and ideas matter a lot in this part of the analysis. We learn how metaphors can dehumanize in ways that can lead to atrocity (such as reframing a despised human

MARTIN BUREAU/AFP/GETTY

group as ‘cockroaches’) and, conversely, how reconciliation is possible when warring groups agree to honour symbols that embody the sacred values of their former adversary (for example, by playing the other group’s national anthem).

The analysis is arresting and the writing often moving, but again I hoped for a hand stretched across the science–humanities divide. Why not mine the work of Holocaust scholars and anthropologists of war-torn societies? Why not all hands on deck?

On other big issues, such as free will, Sapolsky struggles with his intellectual commitments as a scientist and his moral commitments to a more humane world. Decades of behavioural biology have demonstrated that we have little, if any, free will “worth wanting” (as philosopher Daniel Dennett puts it). Yet, even if all behaviours are biologically caused, grossly aberrant ones may be particularly constrained. Sapolsky concludes that our approach to people who commit crimes should be therapeutic and not vindictive; “words like ‘evil’ and ‘soul’ will be as irrelevant as when considering a car with faulty brakes”.

This leads him to a quandary. If you deny free will when it comes to our “worst behaviours”, you must logically deny it when it comes to our best ones. And Sapolsky can’t bring himself to do this. He clings to the “homuncular myth” that humans can transcend their circumstances and do the right thing, even if it is the harder thing. The examples of civil-rights leader Martin Luther King, former South African president Nelson Mandela and less celebrated individuals — anonymous soldiers who negotiated the Christmas truce of the First World War, for example — show us that “we personally can cause change”. But change for good, says Sapolsky, is more likely when we understand what kind of animal we are, as well as which traditional levers designed to enhance moral behaviour work and which ones don’t.

Will better knowledge of human behavioural biology create the conditions for more Mandelas? Is the science secure enough? Is science on its own enough? I am sure that Sapolsky will encounter plenty of sceptics, but being a naysayer is always easier than offering a way forward. In the end, it is impossible not to deeply admire a project bold enough to ask an entire field to work to create a more just and peaceful world. Whether or not success is assured, Sapolsky exhorts us all — please, just try. ■

Anne Harrington is the Franklin L. Ford Professor of the History of Science and director of undergraduate studies at Harvard University in Cambridge, Massachusetts, specializing in mind and behavioural sciences.
e-mail: aharring@fas.harvard.edu

Books in brief

The Songs of Trees: Stories from Nature's Great Connectors

David George Haskell VIKING (2017)

How are forests, “entirely made from strands of relationship”, faring under the human onslaught? Biologist David George Haskell’s exquisitely wrought ecological study documents the fate of 12 trees, around the globe and over time. He explores each one ‘ears first’, attuned to the aural in the arboreal. So an Amazonian ceibo (*Erythrina crista-galli*) is an instrument ‘played’ by rain, as well as a seething tower of life, from bromeliads to bacteria; and a sensor on the bark of a Callery pear (*Pyrus calleryana*) in New York City records distinct responses to the urban din. A ravishing journey into biotic community.

The Seasons Alter: How to Save Our Planet in Six Acts

Philip Kitcher and Evelyn Fox Keller LIVERIGHT (2017)

Political rancour, national foot-dragging and poor communication plague progress on climate change. Philosopher Philip Kitcher and science historian Evelyn Fox Keller pierce the fog with a highly unusual thought experiment: Socratic dialogues on the big climate issues between ‘Jo’ and ‘Joe’ (the voices, respectively, of climate action and of reasoned resistance to it). Far from arch or odd, the extended fictional debate illuminates key scientific, social and political complexities, and humanizes an issue often perceived as abstract. As Kitcher and Keller note, “We need to talk.”

Not a Scientist: How Politicians Mistake, Misrepresent, and Utterly Mangle Science

Dave Levitan W. W. NORTON (2017)

As journalist Dave Levitan reveals in this deliciously mordant critique, a sure sign that a politician is about to fudge facts is the phrase “I’m not a scientist”. Among officials’ techniques for belittling science, such as ridicule, cherry-picking and fabrication, is the fiendish “butter-up and undercut”. This was deployed by US presidential hopeful Ted Cruz at a 2015 Senate hearing, when he gushed over NASA — only to call for cuts to its climate-research funding. A key handbook for an era of “alternative facts” and pressures on research.

The Driver in the Driverless Car

Vivek Wadhwa and Alex Salkever BERRETT-KOEHLER (2017)

Humanity hovers at a momentous technological crossroads, declares engineer Vivek Wadhwa. ‘Exponential’ advances seeping into every cranny of life could propel us towards utopia or dystopia — *Star Trek* or *Mad Max*, as he puts it. Writing with Alex Salkever, Wadhwa ranges over applications from genome editing and the Internet of Things to artificial intelligence, weighing up their potential for risk and the universality of any benefits. Readers may not all share his enthusiasm for autonomous vehicles, but his pointed analyses of the coming transformations add nuance to the debate.

Where the River Flows: Scientific Reflections on Earth's Waterways

Sean W. Fleming PRINCETON UNIVERSITY PRESS (2017)

Rivers, notes geophysicist Sean Fleming in this deft primer, brim with surprises when viewed through a physics lens. There is the chicken-or-egg problem of canyons and rivers, the hydro-ecological links between clouds and fish, the intimate relationship between waterways and groundwater. It is a mind-expanding exercise, Fleming reminds us, to ponder how the shifting levels of these “interstate highways” of the global water cycle are ultimately linked to Earth’s wobbling path across the Solar System. **Barbara Kiser**