

BOOKS & ARTS

Social climbers

Does a baboon's success in social situations depend solely on learning the rules of the game?

Baboon Metaphysics: The Evolution of a Social Mind

by Dorothy L. Cheney & Robert M. Seyfarth

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There are few guiltier pleasures than watching reality television such as *Big Brother*, in which young people interact with each other in confined spaces. Viewers relish seeing each individual trying to push forward their own agenda through alliances and disagreements, sex and friendships. How did we become both agents and voyeurs of such status-striving?

In *Baboon Metaphysics*, Dorothy Cheney and Robert Seyfarth explain that our social reflexes evolved from our group-living primate ancestors. They explore what sort of intelligence is required to navigate the intricate social landscape that baboons live in. Is it based on a complex calculation, a system of innate rules that are applied to specific contexts? Or is it based on simple, implicit rules governed solely by learned associations?

The book's title comes from a line that Charles Darwin jotted down in his 1838 *Notebook M*: "He who understands baboon would do more towards metaphysics than Locke." The quotation reflects the tension between two philosophical schools of thought on the origins of knowledge. One, espoused by John Locke, suggests that the mind acts simply to associate events that have been joined together by proximity and repetition. The other, represented by Immanuel Kant, suggests that perceptions exist *a priori* — that is, the mind is not a blank slate — but require experience for their expression. Darwin, a witness to the stereotyped behaviours of numerous animals, could not abide Locke's view and sought an explanation of the mind that combined the roles of innate tendencies and experience. This tension pervades this wonderful book on the social intelligence of non-human primates and what they might tell us about the evolution of the human mind.

Few are in a better position to address the question than Cheney and Seyfarth. They have spent many years observing and conducting behavioural experiments on vervet monkeys in Amboseli National Park, Kenya — the subject of their earlier book, *How Monkeys See the World* (University of Chicago Press, 1990;



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Understanding how baboons interact could throw light on the origins of the human mind.

see *Nature* 350, 565; 1991 for review), and now work on baboons in the Okavango Delta, Botswana. They share this experience with us in a lively and engaging manner.

First, they lure the reader in with wonderful anecdotes, such as Ahla, the goat-herding baboon, who spontaneously recognized the relationships among her goats, and compulsively reunited any lost baby goats with their mothers. Or there's the orphaned baboon who, when separated from his group, cleverly spent a few days under the protection of vigilant groups of impala, and later vervets, before a jubilant reunion with his fellow baboons.

Next they provide experimental evidence to tease apart what baboons really know about social relationships and how they use this information to get ahead in the world. For example, playing back a sequence of calls that mimics a dispute between individuals reveals that eavesdropping females are acutely aware of who is fighting and whether it involves their family. More transient social relationships, such as sexual dalliances, are also closely monitored. Playing back a recording of a male's grunts with a female's copulation call reveals that hopeful bachelors are acutely aware of another male's consortship, or when a female is making a cuckold of him or when a consortship has ended.

Cheney and Seyfarth argue that this complex

social knowledge cannot be the result of simple associative learning alone, particularly because it does not necessarily result in immediate rewards or benefits. They posit, for example, that baboons learn about hierarchies through observing the close associations between certain individuals. The authors suggest that the number of dyads and triads to learn is too vast, and that putative metrics, such as rates of aggression, do not unambiguously specify the nature of a relationship because they occur with similar frequencies both within and between different family groups. Furthermore, baboons belong to many different social classes concurrently — for example, a female can be a member of matrilineal group, a friend of a high-ranking male, and/or a friend of other females outside her kin — and class membership is liable to change.

What, in addition to associative learning, is necessary to explain baboon behaviour? Cheney and Seyfarth suggest that evolution selected individuals who are predisposed to recognize other individuals' ranks and social relationships to form rule-governed classes. They propose that this predisposition is innate and similar to the human predisposition to learn language. Unfortunately, this is not a very satisfying argument as it leaves much of a baboon's behaviour to some mysterious

innate mechanism. One possibility not mentioned by the authors is that the baboons' social knowledge is based on statistical learning, in which relationships can be implicitly learned through the increased probabilities that certain dyads or triads are seen together or that certain sequences of calls are heard with greater frequency than others. This mechanism is different from typical associative learning in that it is rapid, does not require reward and can be used to generate rules. Under this scheme, any explanation of baboon social intelligence would be completely interdependent with the structure of the current social group and the interactions therein.

We reflexively attribute minds like ours to

non-human agents. Cheney and Seyfarth are acutely aware of this and, with their clever field experiments and careful observations, they address important questions regarding the evolution of social cognition without succumbing to the almost irresistible temptation of anthropomorphizing. Their enthusiasm is obvious, and their knowledge is vast and expressed with great clarity. All this makes *Baboon Metaphysics* a captivating read. It will get you thinking — and maybe spur you to travel to Africa to see it all for yourself. ■

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other educational institutions, the Hebrew University should regard it as one of its “noblest tasks to keep our people free from nationalistic obscurantism and aggressive intolerance”.

This book also includes fascinating documentation of Einstein's private and public responses to the rise of Nazism, in the course of which he forged an influential exemplar of the morally engaged twentieth-century intellectual. Collaborating with other prominent activists such as Romaine Rolland, Sigmund Freud and Bertrand Russell, he continually expressed his hope that the principles taught by great Germans such as Kant and Goethe would some day “prevail in public life and the general consciousness”. This goal required that scientists and other intellectuals would assume public responsibility as advocates of tolerance, rational discourse, non-violence and other humanistic values. Provoked by the accusation from the Prussian Academy that his public statements against fascism constituted “atroc-

ity-mongering against the German people”, Einstein insisted on the moral responsibility of intellectuals to speak out against violent nationalism. When urged by the German physicist Max Von Laue to exercise some restraint, he responded “Does not such restraint signify a lack of responsibility? Where would we be had men like Giordano Bruno, Spinoza, Voltaire and Humboldt thought and behaved in such a fashion?”

Einstein's impact on the relations between science, politics and freedom, however, transcends his record as a public intellectual. Ironically, the unintended wider cultural legacy of his physics worked against his commitment to democratic values and his faith in the mission of scientists to publicly combat violence and irrational politics.

In a letter to Rolland in August 1917, Einstein insisted that “only facts can dissuade the majority of the misled from their delusion”.

But Einstein's concept of facts, as expressed in his exchange with the French philosopher Henri Bergson, was rather esoteric. Failing to appreciate the importance of common-sense realism as the basis of democratic public discourse, he did not seem to anticipate that the shift from newtonian to einsteinian physics would widen the gap between authoritative scientific knowledge and lay opinion. His liberal-democratic commitment was contradicted by his view that “naive realism”, the belief that “things ‘are’ as they are perceived by us through our senses”, was a “plebian illusion”. Deeply concerned about the turning of the public into a herd in the country of Kant and Goethe, he also failed to see that the public in democratic

The atomic peacemaker

Einstein on Politics: His Private Thoughts and Public Stands on Nationalism, War, Peace, and the Bomb

edited by David E. Rowe and Robert Schulmann

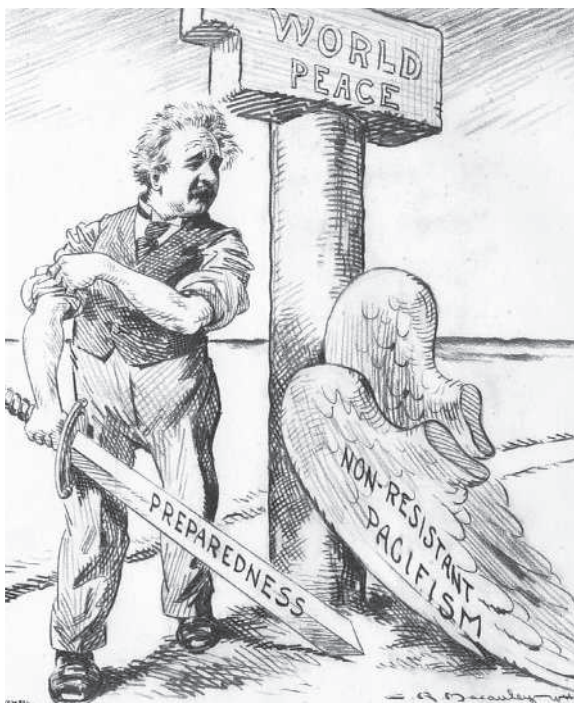
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Yaron Ezrahi

As a German Jew who rose to be the most celebrated scientist since Newton, a pacifist triggered by the rise of Hitler to recommend the development of the atomic bomb, a cosmopolite driven by the fate of his people to support a Jewish nation state, or as an émigré to America who supported socialist ideas in the time of McCarthyism, Einstein was often at the centre of clashing ideologies. A solitary individual who became trapped by the limelight of the world stage, Einstein was reluctantly forced to become an activist. Thus, *Einstein on Politics* is a goldmine for readers interested in Einstein as an engaged intellectual of his era.

Editors David E. Rowe and Robert Schulmann have done an excellent job of collecting, thematically assembling and historically contextualizing Einstein's private letters and public statements on the great political issues of his time. The book is also a fascinating record of Einstein's private thoughts and public stance on the reception of the relativity revolution. Included here are his reaction to the virulent anti-Semitic, anti-relativity German scientists, his tortured relations with the Prussian Academy of Sciences after the rise of the Nazis and his later expressed identification with Galileo for his struggle “to overcome the anthropocentric and mythical thinking of his contemporaries and to lead them back to an objective and causal attitude towards the cosmos”.

Einstein's statement in 1921 that “my Zionism does not preclude cosmopolitan views” could serve as the motto for the vast sections in this book documenting his engagement



Einstein takes up the sword against fascism in this 1933 cartoon from the *Brooklyn Eagle*.

with the fate of Jews. His efforts to reconcile his cosmopolitanism and Zionism found particularly clear expression in his deep engagement with the founding of the Hebrew University of Jerusalem in 1925. Einstein regarded a Hebrew university as a vital part of a Jewish renaissance in Palestine and also as a necessary place for gifted Jewish youths barred by anti-Semitism from many European universities. Whereas the inclusion of ‘Hebrew’ in the name of the university implied a commitment to creating a Jewish home, Einstein had great faith in the mission of the university as an international academic institution. In a statement in March 1925, Einstein insisted that “Jewish nationalism is today a necessity” and that, together with

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