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REVIEW

TIM LEWENS
Cultural Evolution
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One of the centrepieces of the Royal Society's celebration of its 350th anniversary in 2010 was a conference entitled 'Culture Evolves' (Whiten *et al.* [2011]). This proclamation is true, to the point of being a truism, if one takes evolution to mean no more than change over time. Is there another sense of 'culture evolves' that is not only more substantial, but plausible enough to be worthy of serious scientific and philosophical interest? Tim Lewens believes there is, and argues in this lucid and engaging overview of research on cultural evolution that 'the social sciences have little to fear, and something to gain' from the naturalistic approach to culture that it represents. Well-informed about both cultural evolutionary theory and the objections raised against it, Lewens plays the role of an honest broker. He uses his philosophical skills to puncture hyperbole, excise pseudo-problems, and work away at conceptual knots until it is clear where the real troubles lie. Upbeat and generous, especially to scientists, Lewens casts the view of cultural evolution that survives his analysis as eclectic and potentially fruitful. A less generous observer might see the view that survives as a tad disappointing.

The book begins by distinguishing three approaches to cultural evolution: historical, kinetic, and selectionist (Chapter 1). The historical approach assumes only that later states of a culture can be understood with reference to earlier states. (The nature of 'cultural information' is examined in Chapter 3, but, wisely in my view, Lewens does not labour over definitions of culture.) The kinetic approach uses population thinking in its historical analysis. It assumes that large-scale changes in, for example, the distribution within a population of the use of particular technologies, or preferences for certain foods, can be understood as the aggregate consequences of many episodes

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of social learning, in which individuals learn from others. The kinetic approach is identified primarily with the work of Robert Boyd, Peter Richerson, Dan Sperber, and their students. These people combine the use of mathematical models from population genetics with 'methodological adaptationism'; in common with the Santa Barbara school of evolutionary psychology, they assume that reflection on human ancestral environments provides information about how our minds work now, and believe that the mind is composed of domain-specific processing modules. The selectionist approach assumes that the conditions required for natural selection to act—sometimes characterized as variance in fitness, or variation and selective retention (Campbell [1965])—are present in the domain of culture. Representatives of the selectionist approach include Donald Campbell, Karl Popper, Darwin when he was writing about language, and supporters of memetics, such as Richard Dawkins, Daniel Dennett, and Susan Blackmore. Thus, the kinetic approach is nested within the historical approach; selectionism straddles the boundary between kinetic and non-kinetic approaches, but is always historical; and memetics—much criticized by Lewens as by previous commentators—is a subset of the kinetic-selectionist approach, which assumes that cultural variants have powers of replication akin to those of genes.

Lewens devotes the lion's share of the book to the kinetic approach because he regards it as the 'most promising' and the least guilty of 'vacuity'; of offering a re-description of cultural change without additional insight (Chapter 2). Whatever one makes of those arguments, to which I'll return, Lewens certainly finds kineticists saying some strange and contradictory things about cultural information (Chapter 3) and human nature (Chapters 4 and 5). For example, the same pair of authors equate cultural information with mental states and, without further comment, assume that artefacts contain cultural information.

In discussing both cultural information and human nature, Lewens is gentle with the scientists and more robust in his treatment of fellow philosophers. He defends the kineticists against the charge—made by social anthropologists and supporters of developmental systems theory—that their dual (gene–culture) inheritance models depend on an untenable distinction between human nature and human culture. But, turning to the philosophers, he objects to Shea's ([2013]) infotel conception of cultural information on the grounds that it is too categorical to accommodate the gradual emergence of the human capacity for culture; opposes Machery's ([2008]) nomological conception of human nature because it excludes polymorphic characteristics (for example, sex differences), and relies on an underspecified account of what it is for a characteristic to result from evolution; and objects to Samuels's ([2012]) causal essentialist view of human nature as too inclusive.

In the latter part of the book, Lewens argues that although the conceptual foundations of the kinetic approach are sound, it has significant weaknesses (Chapter 6) and limitations (Chapter 7). The weaknesses are in the mathematical models that have been, to date, the principal fruit of the kinetic approach. These models seek to explain why, for example, most new technologies have S-shaped adoption functions: the number of people who use a new technology increases slowly at first, then the rate of adoption increases, and finally it tails off as the innovation becomes widely used. According to Lewens, these models are often flawed in two respects. First, they rely on weak psychological evidence, and therefore may not be modelling the aggregate effects of real psychological dispositions. For example, it remains an open question whether people consistently show conformist bias: an exaggerated tendency to copy the behaviour of the majority of people they observe. Second, even if the psychological dispositions were real, the models would not reliably represent their aggregate effects because they often use mathematical techniques, such as replicator dynamics, in an arbitrary way. Lewens argues that these weaknesses could be remedied. The quality of the empirical evidence could improve, and decisions about how to model that evidence could be made more carefully. However, when he turns to Lewontin's critique of kinetic theories (Chapter 7), after a carefully balanced discussion, Lewens concedes that they have an immovable limitation: they cannot help us to understand cultural change that is due in significant measure to the power of individuals or of complex organizations.

At the end of the penultimate chapter, documenting and roundly criticizing the kineticists' commitment to methodological adaptationism (Chapter 8), I was wondering how Lewens could possibly arrive at the upbeat conclusion he had foreshadowed in Chapter 1. In the event, he did it rather elegantly by arguing for the importance of mathematical models in understanding population-level phenomena, and showing through discussion of the emotions—a neglected topic in research on cultural evolution—that kineticists can and should eject their methodological adaptationism (Chapter 9). If they do that, becoming more 'deferential' to empirical research in psychology, the kinetic approach will not, as some had hoped, unify the social sciences, but it can 'bring a set of useful tools to students of culture' (p. 183).

There are, inevitably in a pocket-sized book of less than 200 pages, some omissions—for example, Lewens says little about the phylogenetic approach to cultural evolution (Gray *et al*. [2007])—and moves that seem too fast. For example, to accommodate the gradual emergence of cultural evolution, couldn't supporters of infotel say that what is inherited becomes increasingly information-like? And if not, how general is the problem of applying clearly defined concepts to gradually emerging phenomena? But I have only one significant worry about this book: I think it may be too quick to dismiss the

selectionist approach to cultural evolution: the idea that cultural change is evolutionary in an interesting way to the extent that it is attributable to Darwinian selection. Lewens convinced me that the problems confronting the selectionist approach are serious, but not that they are fatal, and I was left with a lingering sense that the potential of the selectionist approach had been undersold.

The most serious charge Lewens brings against selectionism in general, rather than memetics in particular, is the charge of vacuity. He uses a semi-hypothetical example in which the characteristics of eastern steamboats were transformed—for example, their hulls got shallower—when they began to be used on western inland waterways, rather than at sea. The selectionist 'explanation' is: 'After removal to a novel environment, variants on the eastern steamboat plan were quickly thrown up and selected, by virtue of their better fit with the new demands of western rivers'. But, Lewens argues, 'The only achievement here is to show that a well-understood phenomenon can be reframed in an evolutionary idiom. After all, the notion that the make-up of made objects can be predicted and explained in terms of the demands of the situations in which they are put to use is hardly revolutionary' (p. 37).

I agree that this selectionist 'explanation' does very little, but I think it does something: it is the first draft of an empirically testable hypothesis, in a domain we don't understand nearly as well as we think we do. We are apt to assume that artefacts, and other cultural traits, come to fit the situations in which they are used because smart people design them that way. Using 'practical intelligence' (Godfrey-Smith [2012]) or 'purposive' thinking (Amundson [1989]), one or more smart people realized that steamboats with shallower hulls are less likely to run aground on a riverbed, and would not be at greater risk of capsizing, because rivers, unlike oceans, don't have big waves. This purposive explanation may well be true in the case of western steamboats, but the cultural selectionist 'idiom' points out that there is an alternative. Maybe no one did the cost–benefit analysis; no individual minds weighed up the pros and cons of shallow hulls. Instead, those variant steamboats that happened to have shallower hulls were more likely to 'reproduce'—to provide a template for the construction of a new steamboat (Godfrey-Smith [2012])—because, in comparison with deeper-hulled steamboats, those with the shallower hulls were more likely to 'survive': they were more likely to be around to be copied because they were less likely to have broken up after running aground.

More generally, I wish Lewens had discussed the possibility that the selectionist–kinetic approach has a particular advantage over the purely kinetic approach: it provides a framework for empirical work investigating the origins of adaptive fit between cultural entities—artefacts, skills, practices, psychological processes (Heyes [2012])—and their environments. To what extent, and under what conditions, is this adaptive fit due to (1) selection operating on

genetic variants, (2) purposive thinking on the part of individual human 'designers' (which may, or may not, involve selection processes inside the head), and (3) selection operating on cultural variants (Campbell [1965])? These questions are so close in spirit to the core of Darwin's achievement—finding an alternative to design as the explanation for adaptive fit between organic systems and their environments—it would be hard to deny that, if answerable, they are worthy foci for the evolutionary analysis of culture. Are these questions not just difficult, but impossibly difficult to address? This book didn't convince me that they are. Rather, Lewens's knowledgeable and incisive analysis taught me about the virtues of the kinetic approach (it can bring valuable mathematical tools from population genetics to the social sciences), and persuaded me that kineticists could benefit from his gently administered advice (for example, drop the methodological adaptationism). But I still think that combining selectionism with population thinking greatly increases the potential explanatory payoff of asking in what sense culture evolves.

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