The British Journal for the History of Science (2025), 1–2
doi:10.1017/S0007087425000068

BOOK REVIEW

Mathieu Charbonneau (ed.), *The Evolution of Techniques: Rigidity and Flexibility in Use, Transmission, and Innovation*

Cambridge, MA: MIT Press, 2024. Pp. 308. ISBN 978-0-262-54780-2. $65.00 (paperback).

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The Evolution of Techniques, a collection of essays edited by philosopher of science and technology Mathieu Charbonneau, provides a fascinating perspective on broad themes of technological change. It has much to suggest to historians of science and technology, who will likely be most familiar with the application of evolutionary models to technology from George Basalla's classic 1989 book, simply titled *The Evolution of Technology* (1989). Among other things, Basalla used evolution's themes of variation and selection to challenge Great Man histories of technology focused on invention. His point was that the selection environment – how users' choices shaped design and production over time – was at least as important as whose head an artefact sprouted from in the first place, often more so. But fields outside history have explored evolutionary models of technological change more extensively, including economics, anthropology, psychology, cognitive science and philosophy. Charboneau's interdisciplinary volume is rooted more in these latter fields than in sub-fields of history.

A fundamental question in applying evolutionary models to non-biological cases is what is varying – what is being selected? Basalla and others, like archaeologists Michael J. O'Brien and R. Lee Lyman, centred analysis on artefacts, which are reformed over time as people find them more or less useful in their contexts. As the book's title suggests, the contributions to *The Evolution of Techniques* centre on techniques – human ways of doing things – as the object of analysis. They are interested in a tension between rigidity, or doing things the same way, and flexibility. Some degree of sameness is required for us to spot a *tradition* in the world. As Charbonneau and cognitive scientist and anthropologist Dan Sperber explain in their introduction to the volume, 'There is no point in transmitting specific means to carry out some practical action if users simply decide to do it their own way; a tradition reinvented every generation is no tradition at all' (p. xii). But some degree of flexibility is also necessary, among other reasons because the quality and type of resources, like wood, mineral, and animal products, will vary by region and over time, as will environmental factors, such as humidity and dampness, that affect how materials need to be worked.

The thirteen essays that comprise the volume have a wild variety and richness, with timescales from some weeks to several millennia, and methods ranging from ethnography to experimental psychology, cladistical analysis of archaeological artefacts, autoethnographical reflections on learning to ride horseback and more. Such riotous variation is far too much to cover in any detail in this short review. One of the pieces I found most interesting was social anthropologist Rita Astuti's more than thirty-year ethnographic investigation of Vezo fishermen in the village of Betania, Madagascar. Astuti explains that

the Vezo people define themselves not in terms of common ancestry but through their way of life, including how they fish, sail and trade. She examines how a new sailing technology, the sprit sail, quickly diffused among the fisherman, and most interestingly she recounts the narratives the Vezo used to explain this rapid change while retaining their ethnic identity.

Other interesting pieces focused on how children learn techniques, including through play, which seems to be fundamentally important for the transmission of techniques. In their contribution, cognitive scientists James W.A. Strachan, Arianna Curioni and Luke McEllin argue that unidirectional observational learning, or direct emulation, during which a less knowledgeable individual attempts to copy the actions of a more knowledgeable one, probably plays smaller role in the transmission of techniques than has traditionally been assumed. Instead, they put forward a picture based on action coordination involving bidirectional informational flows between more and less knowledgeable individuals in a group. This perspective builds on recent work, including from influential figures like psychologist Michael Tomasello, on the importance of joint attention and action for the development of human cultures, and it fits with ideas of the importance of mentorship and (broadly defined) the master–apprentice relationship in technical learning that we find in recent works, such as Matt Beane's *The Skill Code* (2024).

The degree to which any of the topics explored in the volume is settled is clear enough in the concluding chapter, a discussion of the preceding essays by philosopher Kim Sterelny, who has published extensively on the philosophy of biology, especially evolutionary biology, and psychology. Among other things, Sterelny argues that 'there is a false contrast between flexibility and rigidity: the reliable reproduction of technical procedure over many generations does not imply an inability to innovate' (p. 253). He seems to call the very starting point of the volume into question. But if we take seriously sociologist Anthony Giddens's injunction to view theories as 'sensitizing devices', I think there is much that historians of science and technology can learn from *The Evolution of Techniques*. We can attend to forms of rigidity – the kinds of sameness we call traditions – and flexibility in the cases we study, and the institutional, cultural and other structures and factors that push human groups in one direction or the other. Such a perspective could enrich our understandings of how ways of doing things are handed down between generations and what remains stable in the process.

Cite this article: Vinsel Lee, 'The Evolution of Techniques: Rigidity and Flexibility in Use, Transmission, and Innovation', *The British Journal for the History of Science* (2025), pp. 1–2. https://doi.org/10.1017/S0007087425000068