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Léna Soler, Emiliano Trizio and Andrew Pickering (eds.), *Science As It Could Have Been: Discussing the Contingency/Inevitability Problem.* Pittsburgh: The University of Pittsburgh Press, 2015. Pp. 462. ISBN 978-0-8229-4445-4. \$61.95 (hardback).

Was the development of our current science inevitable or contingent? Had certain things gone otherwise during its historical development, could we have ended up with a meaningfully different, but equally successful science? At a general level, these are the kinds of questions that the contributors to *Science as it could have been* attempt to delineate and grapple with. Addressing them requires us first to be clear what we are talking about, and this definitional work leads the authors to ponder some foundational issues. What do we mean by 'inevitable' and 'contingent' (or even by 'science')? Are some aspects or dimensions of science inevitable and others contingent? Does the answer vary between different scientific fields? Upon what kinds of factors are we supposing these dimensions of science to be contingent (e.g., social, political, economic, etc.)? What are our intuitions when faced with questions as to the inevitability (or not) of scientific developments, and what are we to make of them? What are these intuitions grounded upon, and are they legitimate?

The so-called contingency/inevitability (C/I) problem, to which this book is devoted, has only recently attracted scholarly attention in its own right. Previously, philosophers considered such issues simply as subsidiary aspects of older and more established conversations, such as the realism debate. Consequently, as the first volume specifically dedicated to the issue, a good deal of space is devoted to necessary ground-clearing and conceptual clarification. Much of this work is taken up in Léna Soler's introduction, and the two articles in the 'Global Survey of the Problem Situation' section (penned by Soler, again, and by Catherine Allamel-Raffin and Jean-Luc Gangloff). Together, they do an exemplary job of bringing the reader up to speed with the current state of the C/I literature, and pointing to some of the pressing problems requiring future consideration, as well as the relations of contingency/inevitability to other issues in the philosophy of science. The range and scope of the remainder of the volume is impressive. One section explores the relations between contingency/inevitability and the abiding problem of realism (containing contributions from Andrew Pickering, Emiliano Trizio, and Mieke Boon). Essays by Jean-Marc Lévy-Leblond and Hasok Chang examine the relation of C/I to another major philosophical theme, scientific pluralism. Theoretical physics (Lévy-Leblond), geology (Ronald Giere), and psychology (Michael Bitbol and Claire Petitmengin) are just a few of the many scientific fields which are approached through the lenses of contingency and inevitability.

Strikingly, an entire section of the book addresses contingency/inevitability in mathematics (with essays by Jean Paul Van Bendengem, Jean-Michel Salanskis, and Ian Hacking). For many of us, our gut tells us that mathematical developments have more than a hint of inevitability about them; mathematical truths are 'out there' awaiting eventual unveiling. Yet, several of the authors (Soler, Pickering, Chang) suggest that such an attitude might not be limited to the history of mathematics; though it may well be strongest there. These authors hold that inevitabilism has served as a 'default' position in the C/I conversation about science in general. Consequently, the contingentist is saddled with the full burden of proof; they must show that things could in fact have been otherwise, with recourse to history often being the preferred strategy. The 'put-up-or-shut-up' demand—the subject of Soler's contributed chapter—crystallises this dialectic. The inevitabilist asks their contingentist challenger to provide a concrete case of a truly alternative yet equally successful science, or else kindly 'shut up'. In this way the inevitabilist, occupying the 'default' position, dictates the playing-field.

Historians, who have long been drawing attention to the roles of social, cultural, economic, and other 'contingent factors' in shaping scientific developments, surely have instructive insights to contribute to the discussion of inevitabilism's default-status and supposed intuitive plausibility. Generally, the C/I discourse seems particularly fertile ground for reflections which transcend traditional divisions between historical and philosophical approaches. For instance, a major theme throughout the volume, which lends itself to such historico-philosophical treatment, is the role (if any) which counterfactual history should play in our discussions of the C/I issue; a topical issue given the recent surge of interest in counterfactual history of science, owing to the work of Greg Radick and Peter Bowler, among others (see, particularly, the chapters from Giere, Bitbol and Petitmengin, and Lévy-Leblond).

This book is self-avowedly a work of philosophy, authored, for the most part, by card-carrying philosophers. But, rather than a collection of essays emanating from the proverbial philosophical armchair, the volume both calls for, and in parts exemplifies, a more sophisticated approach to the C/I problem, which takes historical work seriously. This owes to both the scholarly sensitivity of the contributors and editors, but also the stimulating nature of the contingency/inevitability issue as a guiding framework for historical and philosophical engagement with the sciences, in contrast with, say, the realism issue. Though recourse to history underpins some of the classic arguments offered in the realism debate, others are formulated in the abstract. The latter approach is less obviously an option in the contingency/inevitability debate, as each position makes an explicit claim about science as a historical process. 'Truth' and 'reality'-notions traditionally falling under the remit of philosophy—can, in principle, be bracketed. A 'false' theory may conceivably become orthodox, inevitably, for various historical reasons. The historian of science can thus ask some interesting questions: just why was it that the acceptance of such-and-such scientific theory became inevitable at this time, in this place, among this community of practitioners? At what point did the effects of 'contingent' factors cease to be important in determining the trajectory of a particular scientific development? Ronald Giere's contribution takes up these issues explicitly and suggestively. Historicising the problematic, by conceptualising contingency or inevitability as historically emergent phenomena, rather than as static and universal philosophical views upon the nature of 'science', invites the historian of science to take up the reins. Careful historical examination of different episodes from the scientific past may well give different answers to the question of whether the 'science' under focus was inevitable or contingent. The resolution of the C/I 'debate,' then, may simply be to deny its status as such. Reflection on questions of contingency and inevitability can, instead, be harnessed in developing a new tranche of historiographical tools which allow the posing of novel kinds of questions about the historical development of the sciences.

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