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**Creating Scientific Controversies: Uncertainty and Bias in Science and Society**

David Harker

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Harker’s book is an interesting and illuminating mix between introductory texts on Critical Thinking and the Philosophy of Science. Using the idea of the “created scientific controversy” as a foil, Harker aims to show how grasping the basics of critical thinking and the history of philosophy of science can help us navigate and grapple with some recent public controversies: anthropogenic climate change, intelligent design as a scientific alternative to evolutionary theory, vaccines’ alleged link to autism, and the harmfulness of GMOs in food. Harker draws deeply upon the 20th-century American Tobacco Industry’s campaign and agenda to obfuscate the public perception of the scientific consensus on the health risks of smoking, which he deems the exemplary “created scientific controversy”. Harker’s text thus doubles as a small treatise on the nature of the created scientific controversy as a specific phenomenon distinct from a “genuine scientific controversy”. The book serves well as a textbook for students of the Philosophy of Science or Critical Thinking, but readers looking for a more technical or in-depth treatise on the nature of created controversies might do well to consider this text as a primer for further research.

 Although the book is designed for best use in undergraduate courses or seminars, it would likewise be suitable for group or individual reading. As a pedagogical and discussion text, Harker’s book works magnificently; this should come as no surprise, as Harker states in the preface that his book was inspired by teaching an introductory college course on similar topics. It is clearly tailored for this purpose: the book is uniquely set into three distinct parts, and each part consecutively builds off the previous. Each chapter ends with a nice recap and series of discussion questions, and each part is tailed with a thorough “points to remember” section. Moreover, Harker consistently revisits and contextualizes important themes that might be difficult for first-time readers of Philosophy to grasp upon their first read-through, particularly in the first part of the book. Harker’s book thus often narrates as if it were a tutor, as it habitually rehashes difficult concepts with differing terms and vantage points in order to make the central ideas more vivid.

 The three parts are “Lessons from the Philosophy of Science” (chapters one through four), “Biases, Arguments, and Created Controversies” (chapters five through seven), and “Exposing Created Controversies” (chapters eight through ten). Chapters one through four, the strongest part of the book, act as a sort of “crash course” in the history of the philosophy of science, discussing topics such as the problem of demarcation, the nature of empiricism, Kuhn and scientific revolutions, and the Duhem-Quine thesis and underdetermination. The resulting goal of this section, which Harker laudably achieves, is to get readers to view science as a dynamic, ever-reforming research programme that has both *influenced* and *been influenced by* the particular times and societies through which its development has been situated. Chapters five through seven discuss particular topics in critical thinking and cognitive and social psychology that play a starring role in the evaluation of public controversies, such as confirmation biases, heuristics in reasoning, valid forms of argumentation, and deceptively fallacious forms of argumentation. The purpose of this section is to lay out the philosophical and psychological toolkit readers will need to begin properly assessing the created scientific controversies laid out in part three, and it is to my opinion the freshest and most novel aspect of Harker’s book. The final three chapters, which are the weakest in the book, discuss the titular controversies outright, in light of the previous seven chapters. Respectively, the three chapters cover the controversies surrounding anthropogenic climate change, intelligent design, and Aids, Autism, and GMOs.

 I recently used this text as a supplement to an introductory undergraduate course on critical thinking with mostly positive results. First and foremost, Harker’s text fosters fruitful discussion and clearly brings many of the seemingly arid, esoteric discussions of the academy (e.g., problems of scientific demarcation or of understanding empiricism) into immediate relevance and applicability into the more familiar debates, discussions, and kerfuffles found, e.g., among the news or within social media. To illustrate and make this point more vivid, consider this scenario:

 Janie and Jacqueline are both incoming students who are paired together in a dorm, and they quickly become friends. Several weeks later over social media, however, the topic of climate change arose, and Janie was disturbed that Jacqueline was so disparaging of the concept. She was especially taken aback when Jacqueline reiterated a popular talking-point in a comment thread full of climate change deniers, stating that “global warming is a hoax created by the government to make money.” Janie was further dismayed to see so many strangers in the thread applauding Jaqueline’s statement in agreement, especially since Janie is convinced that this claim is *obviously* ignorant, false, and misleading. It seems to Janie that many people seem to blindly rally behind these sorts of statements in guileless lockstep. Janie is now having second thoughts regarding her friendship. “Is Jacqueline one of *those people?*”

Situations similar to Janie’s are very common, and are unquestionably relevant for the average college student. Perhaps the strongest aspect of Harker’s book is that it equips the reader with the knowledge she needs in order to navigate situations like these. If Janie had read Harker’s book, for instance, she would have realized several familiar patterns of psychological and sociological behavior going on here, and therefore would have been more equipped to confront her dilemma regarding her friendship with Jacqueline. Janie would have a new understanding and appreciation as to why so many people rally behind a particular phrase or two (especially amid certain social circles), why she feels that Jaqueline is now on the “other side”, and how a “perfectly rational” person could think something “so obviously false”. Janie moreovermight have also been more sensitive to detecting signs of bias regarding her *own* perspective and biases, upon realizing her reaction to Jacqueline.

 The first seven chapters of this book, especially those in part 2, all build on these themes and do it very well. Moreover, Harker’s goal of getting readers to understand the nature of science in a clear, historical, and philosophically nuanced light is a welcome topic, as mere science illiteracy is perhaps *the* underlying bedrock of public scientific controversies (a point which underlies much of Harker’s analyses, but which is mysteriously left merely implicit in his account of created controversies). After reading these first two parts of the book, the reader indeed achieves

“a greater appreciation for how science works and what it can and can’t accomplish, how the appearance of controversy can mislead, why we should be cautious about our intuitive reactions to certain arguments and ideas, some of the most common errors of reasoning that lead people astray and some basic strategies for assessing claims and evidence.” (15)

 My main concern for Harker’s book, though, is that in the third part the book takes an unfortunate plunge in the quality of tone, theme, and style. Whereas the first two-thirds of the text take a mentoring, preparatory, rhetorically *passive* approach—which is fitting for a text focused on topics such as uncertainly, cognitive biases, intellectual humility, and critical thinking—the final chapters have more of an authoritarian, dogmatic approach. What the reader is confronted with in part three is a rhetorically *active* tone, one which *tells* the reader what to believe and think, as opposed to one which offers more balanced, nuanced, and collected dialogue up for the reader’s discretion. My students spotted this irony with ease.

 The issue is not that his central contention (e.g., that we should, all-things-considered, side with the scientific consensus on issues like the safety of GMOs, or anthropogenic climate change) is problematic; in fact, I agree: when we consider how many of these controversial cases exhibit the tell-tale signs of a created controversy, we are indeed justified in siding with the scientific consensus against those who are pushing an agenda and obfuscating the genuine philosophical and scientific issues at hand. But what’s problematic isn’t *that* Harker argues for this position; rather, what’s problematic is *how* he argues for this position: the nuanced quality and style, careful and objective language, and scholarly tone from parts one and two are simply absent in part three. Consider, for a quick illustration, his thesis statement from the introduction, *vis-à-vis* an excerpt from chapter nine (on the Intelligent-Design controversy):

“The primary purpose of this book is thus not to persuade readers … Rather than argue strongly for any particular views across a whole range of issues, the objective of this book is instead to encourage and cultivate critical, honest and reflective thinking and, where necessary, openness to revising prior attitudes.” (15-16)

“Those who continue to defend ID are forced either to twist these facts or grouse that scientists either ignore the arguments or are intolerant because they’re motivated by atheist and materialist prejudice… The only justification I can see for even mentioning ID within a science classroom is if it is part of something like the following statement: ‘… the scientific community is unambiguous in its evaluation… The arguments are weak. The evidence for the central claim is non-existent. There is nothing of scientific value within ID. Time is precious, so we will not be wasting more time on the topic … there are [no good] reasons for discussing [ID].’” (220-221)

This discrepancy in tone and style might be explained by the fact that the first two sections of the book are the central, substantive contributions of Harker’s book. In a sense, then, the final chapters are somewhat of an afterthought. Why these final chapters fail—especially for pedagogical purposes—is that the reader is presented with superficial, quick, sometimes glib analyses of what are in fact complex issues. For example, rather than presenting carefully-cited, clear arguments for why Intelligent Design (as an alternative to evolutionary theory) is more of a “created” controversy than a “genuine” one, Harker offers broad, simplistic assertions which rhetorically undercut the stated thesis of the book.

 *Creating Scientific Controversies* is nonetheless a certainly-worthwhile read, as it neatly carves out and interconnects topics which have heretofore received only disparate treatments. Moreover, Harker’s book is the first book-length treatment of this concept, a fact which alone makes it noteworthy. Although Harker’s analysis of the created controversy could have been far more technical and in-depth (to take one of the more glaring examples: chapter seven, which takes *defining* the created controversy as its thesis, never actually gives an explicit definition but rather goes about discerning the key, common traits of *what we already take to be* created controversies), Harker’s text is aimed at the novice or student reader and as such generally succeeds in its goals.

Another note worth stating is that, although it is tangential to chapter nine’s chief question of whether or not Intelligent Design (as an alternative to naturalistic evolution) is a created controversy, Harker includes an outstandingly-written survey of the history of science’s relationship with religion, which gives both a fair and critical analysis of the way the debate has played out in the public sphere by exposing popular myths from pro- and anti- religious parties alike.

When discussing the particular niche for his book, Harker states that, “What’s needed [as opposed to detailed analyses on controversial topics] is for us to respond better to the appearance of doubt.” (16). Although Harker’s book doesn’t *exhibit*, in the final section, how to “better respond” to created controversies with clarity, accuracy, and humility, it does very well *explicate* both (i) how to detect such controversies and (ii) how they are engineered in society through exploiting science illiteracy, in-group/out-group heuristics, subconscious fears and desires, pre-existing beliefs, and confirmation biases. Harker’s analysis of how created controversies are distinctively agenda-driven is also penetrating and insightful; he successfully illustrates how their underlying motive is often ulterior and non-scientific, and how they cherry-pick data, push skepticism, and promote a deceptive ardour of fairness and authenticity.

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