**Huw Price** and **Richard Corry**, eds.
*Causation, Physics, and the Constitution of Reality: Russell's Republic Revisited.*
Cambridge: Cambridge University Press 2007.
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**Peter Machamer** and **Gereon Wolters**, eds.
*Thinking About Causes: From Greek Philosophy to Modern Physics*.
Pittsburgh, PA: University of Pittsburgh Press 2007.
326 pages
US$75.00 (cloth ISBN 978-08229-4309-9)

We all know Bertrand Russell's famous declaration that 'causation is a relic of a bygone age, surviving, like the monarchy, only because it is erroneously supposed to do no harm.' Russell would no doubt be upset that the British monarchy is still going strong. He might be equally upset that far from being a relic, the concept of causation is now an important and central part of every modern philosopher's toolbox. Both books reviewed here demonstrate that causation is still going strong too.

However, as Price and Corry point out, causal eliminativism is not a necessary concomitant of adopting a broadly Russellian stance with respect to causation: causal republicanism is a possible middle ground between eliminativism and 'full-blown causal realism' or 'causal fundamentalism'. Hence, Russell's general conclusion that causation does not find a happy home in fundamental physics is generally adhered to, but the *utility* of the concept of causation is not denied. To continue Russell's analogy: the monarchy, though not in line with most rational people's system of values, nevertheless brings in those tourists (and their money)! Causation likewise deserves its place in our toolbox on similarly pragmatic grounds.

Unlike Price and Corry, Machamer and Wolters feel under no obligation to defend the study of causation, so prevalent is it in contemporary philosophy. However, most of the essays collected in their book are primarily historical in outlook. Although certainly diverse, these essays hold the concept of causation in high regard—though most *do* shy away from extreme causal fundamentalism.

Whereas Machamer and Wolters' book might have caused Russell some discomfort, then, Price and Corry have tried to put together a book that would have enabled him to rest a little more easily. Both books are excellent and are of a consistently high standard. It goes without saying that they will be required reading for philosophers

interested in causation and metaphysics in general. Price and Corry's book contains much to recommend it to a wider audience, including philosophers of science, physics, and time. Let's say something more about the nature of the problem, whilst introducing the contents of the books.

Russell's claim was an empirical one, based on the fact that though physicists often use causal talk, the actual theories of fundamental physics (both *qua* mathematical representation and *qua* specification of the ontology) contain no trace of causation. Naturally this is a problem for fundamentalists. According to Russell, one simply has functional relationships and should leave it at this. Many (not all) of the essays in Price and Corry's book aim to defend this view. The basic strategy is to point to the time-reversal invariance of the laws (taken independently) of fundamental physics. Causation is certainly a concept that involves direction in time. Hence, one cannot base an account of causation on fundamental physics since one cannot capture even the most basic asymmetry of causation. Some of the contributions aim to capture this asymmetry in some way using principles of physics. One has to account in some sense for the apparent existence of causation, whether it is fundamentally illusory or not. This is the job of other essays.

The book begins with a useful and very clear introductory essay by the editors, explaining the project of causal republicanism and the ways in which the other essays fit into the project, or clash with it. John Norton, Chris Hitchcock, James Woodward and Adam Elga defend, in various differing ways, the *usefulness* of causation in science, despite its absence in fundamental physical theory. For example, Norton argues that causation is part of a *strictly false* 'folk theory': causation minimally requires certain constraints to be met (deterministic or at least probabilistic dependence between events) that simply aren't met in any physical theories (not even in good old Newtonian mechanics). This line is also followed in Norton's contribution to Machamer and Wolters' book.

However, like many items from folk theory, the fact that causation is not a 'fundamental' part of reality does not imply that it is without virtue. Woodward shifts his focus away from physics to the 'upper-level sciences' (the social sciences, for example). He argues that causation gets a different treatment in these sciences than it does in fundamental physics: that causation has no home in the latter says nothing about its role in the former. Ultimately he defends a pragmatic stance, pointing to the utility (or *effectiveness*) of causal strategies in the upper-level sciences. Elga's contribution builds on the well-accepted utility of causation, and attempts to find out what preconditions our universe must meet in order for such causal utility to exist in the first place. Elga argues that the answer lies in the universe's initial conditions. In their essays, Barry Loewer and Douglas Kutach try to derive a causal asymmetry from such a 'past hypothesis', and so find a home for causation in physics. However, Mathias Frisch argues that this move is problematic, because it cannot properly account for the *meanings* of the causal claims we

make. This is not a good argument: one might as well say that quantum electrodynamics (QED) is wrong because when people rest their cups on the desk they don't do it on the basis of knowledge of the forces acting on electrons. QED nonetheless accounts for why people are able to act in this way, safe in the knowledge that their cups will be supported by the table. Moreover, it would appear that a move that grounds the causal asymmetry like this readily paves the way for anti-republican positions.

There is an undercurrent of reductionism in this book, and (though less so) in Machamer and Wolters' book. Physics lies at the root of everything: if physics can't deal with causation, then nothing can. However, epidemiologists and social theorists would clearly take issue with this sentiment. Most of the good recent work on causation in science has occurred at these levels of complexity, yet Woodward is the only one who faces these aspects of causation head-on. Anthony Eagle pursues a similar line, questioning the reductionism that leads us to bestow upon fundamental physics the role of judge and jury in deciding ontological commitment. Choice, says Eagle, should be based on pragmatic factors, and these lead us to accept causation on pragmatic grounds *for certain perspectives*. The 'fundamental physics' perspective does not submit well to causal claims, but an 'agent based' perspective does. Peter Menzies, Helen Beebee, and Huw Price each go on to develop variations on the *perspectivist* theme, and Arif Ahmed develops an approach that attempts to *reduce* causal claims precisely to those involving human agency. Menzies' perspectivist position involves 'context sensitivity': the truth values of causal claims are not context-invariant. He then utilizes Pearl's 'surgical' account of causal modeling to further develop the position. Beebee's is the only historical chapter, and it aims to fit Hume into the mould of causal republicanism, showing how a story can be given about how we appear to see causal connections in the world despite their non-existence at a fundamental level: causation amounts to a *projection* onto the world by deliberative agents. Price defends an explicitly perspectivalist position with respect to causation: he too views causation non-objectively, as a matter of agents rather than the world. Price's concern is with the temporal asymmetries of causation: it is the *modal* asymmetries of causation that are perspectival.

As this brief review of the contents shows, the essays in Price and Corry's book show a remarkable degree of coherence and unity. The same cannot be said for Machamer and Wolters collection, though it does contain a few gems. The contributions come from the Seventh Pittsburgh-Konstanz Colloquium, and their diversity stems from the fact that the editors wanted to integrate both contemporary topics in causation and the history leading up to these topics. It begins, as the title states, with the concept of causality in Greek philosophy. We are then led through issues of causation in medieval theology and philosophy, early modern, modern, and then into contemporary physics. Nine historical chapters are followed by seven philosophical chapters.

To begin, there are three essays each tackling different aspects of causes in Greek philosophy. Jurgen Mittelstrass begins with a chapter focusing mostly on Plato and

Aristotle's writings, but some pre-Socratic discussion is included, where the basic home for causation is the dichotomy between generation and corruption. This analysis shows, I think, that though we still have our own confusions about causality, we have come a long way since the Greeks: modern philosophy is not just footnotes to Plato! Brad Inwood shifts from causation in ancient cosmology and physics, to ancient ethics. He examines the idea that grasping the cause of some event or phenomenon is connected to human happiness (or thriving), because understanding the ways of Nature underlies human fulfillment. I have to confess, I had some trouble unpacking the key points of Inwood's chapter. The subsequent chapter by Emidio Spinelli is apparently a defense of Inwood's position, but it makes it no clearer what that position is. This, no doubt, is simply a disciplinarity problem: both chapters are examples of classics rather than philosophy.

The chapter that follows, by Marilyn McCord Adams, deals with theological aspects of causality, focusing on the sacraments and their 'causal powers' (or, rather, their lack of them) and the scholastic treatment of this problem. Adams argues that in this discussion of causality the scholastics were an awfully long way from the kind of empiricist reductions that were to come later. Robert Schnepf sticks with the scholastic theme (though in this case, late scholasticism), offering a close analysis of the relationship between Malebranche's occasionalism and Descartes' philosophy. Drifting a little from the subject of causality, Eric Watkins advances forward to Kant, giving a clarification of Kant's transcendental laws. There are similarities to the kind of perspectivism mentioned above, for Kant's position, argues Watkins, is that the laws are based largely on our 'epistemic natures'. Indeed, Watkins' chapter, and many that follow, would sit comfortably in Price and Corry's book.

Next come two chapters on John Stuart Mill's conception of causality. Laura Snyder argues convincingly that Mill's political views filtered into his views on causation in science; further, the latter were designed to enable Mill's reformist political goals. Reform through intervention demands an appropriate account of causality; this is what Mill supplied in his *System of Logic*. Paolo Parrini examines the notion of 'the historical turn' in the philosophy of science that Snyder's chapter contributes to. Parrini is rightly critical of the stopping short of many historical analyses written under the guise of the aforementioned historical turn: unpacking the context within which claims were made is a crucial piece of the analysis, says Parrini, but the historian's task ought to be deeper, including an appraisal of the ideas *independently* of their contextual baggage.

Next there are three chapters on causal pluralism (and non-fundamentalism in general), all of which exhibit the pragmatism that we met in Price and Corry's book (although Hitchcock opposes 'radical pragmatism'). Raffaella Campaner and Maria Galavotti defend the idea of causal pluralism through a detailed examination of various forms of mechanist and manipulationist accounts. The authors suggest (by means of a well-chosen biomedical example) how, contrary to prevailing opinion, these two approaches to causality should be viewed as complementary rather than conflicting. Chris

Hitchcock takes a step back and considers exactly what is meant by 'causal pluralism' and what it involves. Hitchcock gives a brilliant unpacking of the interpretive possibilities. Norton, as already mentioned, defends causal anti-fundamentalism (albeit in a very different manner in this volume). John Norton shows how various principles of physics that appear superficially to be causal ones, really are not: they are instead ways of talking about the conditions that events and processes must satisfy if they are to be described by particular theories.

Larry Shapiro and Elliot Sober present a wonderful analysis of August Weismann's refutation of Lararckianism via a demonstration of (what we would now view as) the failure of parental-phenotypic to offspring-genotypic transmission, using an experiment involving parental mice with severed tails producing offspring with tails. They connect this to epiphenomenalism, since this view involves the causal inertness of one class of properties with respect to another class (though not to all other classes). They build from this analysis to defend the view that macrocausation entails microcausation, but not vice versa: one can have causally inert macrovariables that have causally efficacious underlying microvariables with respect to other macrovariables. In the next chapter, Peter McLaughlin sticks with the biological theme and argues against Sober's claim that the theoretical concept of 'selection' benefits somehow by its congruence with the ordinary language understanding of that term. This is a normative thesis: the restriction to ordinary-language would be an impediment to certain ways of theorizing and modeling. McLaughlin argues that it is an empirical matter to determine the congruence between the theoretical concept and ordinary language, not something that is legislated in advance.

The book finishes with a chapter on causality in economics by Sir Clive Granger, and a chapter on free will by Wolfgang Spohn. Granger presents an exceptionally clear introduction to the problems and prospects of causality in economics and econometrics (primarily: forecasting in time series—work related to that for which Granger was awarded his Nobel prize). That this chapter is included is surely evidence that those in the special sciences view the concept of causality as far from buried!

To sum up: the quality of the essays of both books is consistently excellent—a rare occurrence for collections of this sort. There are some real gems in both. However, only Price and Corry's book is likely to consistently please an individual reader: the Machamer and Wolters collection is a very diverse mixture. However, both books will be essential reading for philosophers interested in causation and surrounding areas.

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