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***Causation, Physics, and the Constitution of Reality: Russell's Republic Revisited***, edited by Huw Price and Richard Corry. Oxford: Clarendon Press, 2007. Pp. 403. H/b 68.00, P/b £24.00.

This is an outstanding anthology. It contains extended reflections on Russell's idea that our notion of causation is a relic of stone-age metaphysics, which fails to fit contemporary physics and thus deserves elimination ('On the Notion of Cause', *Proceedings of the Aristotelian Society*, 13, 1913, pp. 1–26). It will be of interest to anyone interested in causation or the physical image of the world, and to anyone interested in reconciling the manifest and scientific images.

*The question of fit*: Virtually every contributor agrees with Russell that folk causation does not fit the scientific image, though for different (albeit compatible) reasons. For some the problem is that causal relations are local while laws are global, concerning entire hypersurfaces of back light cones. For others the problem is that causation is asymmetric while laws are time symmetric. Still others take the problem to arise for reasons internal to causation and independent of the physical details: causal modelling techniques are said to require the notion of an intervention from outside, and thus not apply to the cosmos; also causal discourse is said to be context-sensitive.

*The consequences of a poor fit*: Virtually every contributor disagrees with Russell that folk causation should be eliminated for lack of fit, though different (seemingly incompatible) preservative claims are made. For some, folk causation remains a decent heuristic akin to concepts like Newtonian gravity. For others, folk causation is viewed as a perspectival notion developed from our agential viewpoint, which remains real from that perspective.

I will offer very brief summaries of the contributions (Sect. 1), followed by discussion of both the question of fit and consequences of a poor fit (Sect. 2).

## 1. Summaries

Price and Corry provide a useful and accessible introduction, summarizing the main themes and connecting the various contributions. Norton then argues that causation is a crude notion which merely approximates the developed concepts of mature science. But he also argues that causation provides a useful approximation in certain domains, much like Newtonian

gravitation is still useful when the spacetime curvature is low. He concludes that causes, like caloric and gravitational forces, ‘have a derivative reality’ (p. 31). He thus aims for a compromise between fundamentalism and fictionalism.

In the second paper, Hitchcock evaluates four theses from Russell, separating the ‘hard problem’ of causation from the ‘easy problem’ (pp. 57–8). The hard problem consists in distinguishing casual from non-causal relationships, and grounding causation in physics. Here Hitchcock mentions the idea that counterfactuals — needed to ground Cartwright’s distinction between effective and ineffective strategies (*How the Laws of Physics Lie*, Oxford: Oxford University Press, 1983) — are characterized via outside interventions, in a way inapplicable to the cosmos. The easy problem consists of working within our folk concept — explicated via causal models — to taxonomize our concepts. In this way Hitchcock aims for a more nuanced mapping of our concepts, independent of fit with physics.

Next, Woodward continues the focus on causal modelling. He offers an account of our causal concept based on a non-anthropic conception of intervention. Causal modelling notions are said to be legitimate even if not found in physics, so long as ‘we can explain why they are useful, what work they are doing, and how their application is controlled by evidence’ (p. 67). Woodward concludes by suggesting that causal relations are as real as are attributions of chance to deterministic systems. Such attributions are not fundamental, but equally they are not arbitrary. Perhaps Woodward would agree with Norton that these concern a derivative reality.

Continuing, Elga (agreeing with Norton) says that the laws are such as to make folk causation useful in certain domains, and asks how. He points out that our folk concept is local and encoded by crude dispositions, while physics is global and written in differential equations. So where and why does causal thinking work? Elga’s answer consists in distinguishing between insensitive systems (like rocks), detector-like systems (like light detectors), and quasi-chancy systems (like gambling devices). He sketches a physical explanation for why our causal thinking works fairly well for such systems.

Ahmed turns the discussion to agency theories of causality, such as defended by Menzies and Price (‘Causation as a Secondary Quality’, *British Journal for the Philosophy of Science*, 44, 1993, pp. 187–203). He argues that such theories need not be circular. He begins by suggesting that Menzies and Price did not rebut the charge of circularity, since their notion of a free agent requires a certain kind of causal history. So Ahmed steps in, and illustrates a betting pattern that would suggest that someone had the concept of free agent without the concept of causation.

With Eagle’s contribution the perspectival idea comes fully into play. Eagle (agreeing with Hitchcock and Woodward) suggests understanding our concept of causation via causal modelling. He grants that causation is not needed for a complete *description* of reality, but adds that it is needed for

*explanation*. Causation is practically indispensable for us as agents. Without it, 'the world would be an alien and incomprehensible place' (p. 170).

Menzies continues three emerging themes—those of explicating our concept via causal modelling, claiming a poor fit with physics, and drawing a perspectivalist conclusion. Menzies's argument for lack of fit is not driven by physics, but rather by the claim that 'the concept of causation is context-sensitive' (p. 192). He develops an account of how this works, via his notion of 'default worlds' (models in which the exogenous variables are set to contextually determined 'natural' values). The metaphysical conclusion reached is 'perspectival realism' (p. 193), on which causal claims are true relative to a perspective.

The next contribution—and the only historical paper in the volume—is from Beebe, who develops a projectivist reading of Hume. According to Beebe, Hume views causal talk as having two features. First, it has the surface of descriptive discourse: 'we speak and think as though causation were a mind-independent relation' (p. 227). But secondly, it is not descriptive in function but rather expressive. If so then Hume's view would not be troubled by the question of fit with the physical image, since for Hume causal talk is not even in the game of describing reality.

Price then argues for perspectival realism. He introduces the notion of being a foreigner as perspectival. Who counts as a foreigner depends on who is counting—yet still 'foreigners are as real as we are' (p. 250). Price then suggests that we should think of the causal, temporal, and counterfactual asymmetries—given time-symmetric laws—as grounded in our agential perspective. At the conclusion Price notes that causation is tied to explanation, and hints that science itself might turn out perspectival: 'some perspectives simply cannot be transcended' (p. 290).

Next, Loewer argues for objective asymmetries, from Albert's Past Hypothesis (*Time and Chance*, Cambridge, MA: Harvard University Press, 2000). Loewer posits two new fundamental laws. Roughly, the first law posits a low entropy macro-condition at one boundary of the universe, and the second law posits a uniform probability distribution over possible micro-realizations of this macro-state. He uses these laws to formulate an account of decision conditionals, and suggests an account of non-decision conditionals 'parasitic on decision conditionals' (p. 320). Thus, while Loewer and Price disagree about the objectivity of the asymmetries, they may still agree that causal reasoning arises from our perspective as decision-makers.

Kutach takes a novel perspective on the question of the fit. He views our causal concept as having two components—determination and asymmetry—and regards each component as fitting the scientific image. But he sees them as fitting in different places. The determination component fits the laws, requiring fine-grained micro-events. While the asymmetry component fits the Past Hypothesis, requiring coarse-grained macro-events. As a result,

like partners in a doomed marriage, ‘these two components do not cohabit peacefully’ (p. 328).

In the final contribution, Frisch critiques Albert’s Past Hypothesis (and thus the contributions by Loewer and Kutach). One criticism is that the Past Hypothesis is unnecessary to explain how we reason about records, or to justify our reasoning. A second criticism is that the Past Hypothesis does not suffice for the reliability of records. So Frisch concludes that the asymmetries have yet to be grounded in physics.

## 2. Discussion

Four main problems of fit with physics have emerged. One problem is said to be that causation is local while laws are global (Elga, Kutach). But as Eagle replies, the real fault ‘lies in the conception of causation as requiring determination’ (p. 161). A counterfactual-based explication of our causal concept resolves this problem, allowing local causation to mesh with global laws.

A second problem is that causation is asymmetric while laws are symmetric (Price, Frisch). But it is not obvious that there is no remaining physical basis for asymmetry. Matters depend on the outcome of the dispute over the Past Hypothesis (Loewer and Kutach versus Frisch).

A third problem is that causal modelling—involving the idea of an intervention from outside—is inapplicable to the cosmos (Hitchcock, Woodward?, Eagle). But the notion of an intervention assumed in causal modelling need not be understood as literally a hand from outside. The assumed notion of an intervention seems to only require change to the value of a variable  $X$ , without changes to any variables causally upstream of  $X$ , or changes to any variables causally downstream of  $X$  except through the change to  $X$ . So it is unclear to me why we cannot consider such interventions on variables in a causal model of the cosmos.

A fourth and final problem is that our causal discourse is itself context-sensitive (Menzies). But there must be some parameter of context to which our causal discourse is sensitive—perhaps the relevant alternatives to the events under discussion. Then there will be a context-insensitive relativized notion incorporating this parameter. For instance, letting  $C^*$  be the set of relevant alternatives to  $c$  and  $E^*$  the set of relevant alternatives to  $e$ , it will be objective whether  $c$  rather than  $C^*$  causes  $e$  rather than  $E^*$ .

So it seems to me that the question of fit remains a fascinating and open question. Along these lines I should mention Salmon’s claim that relativity is formulated via the notion of a signal, which is *prima facie* a causal notion (*Scientific Explanation and the Causal Structure of the World*, Princeton: Princeton University Press, 1984, pp. 141–4). So there is even a case for the claim that physics retains causal notions.

In any case, supposing a poor fit, three main conclusions seem possible. There is Russell's eliminativism (not endorsed by any contributors), the reductionist view that causation is a feature of derivative reality (Norton, Elga?, Woodward?, Loewer?, Kutach?), and the perspectivalist view that causation is real from our agential perspective (Ahmed?, Eagle, Menzies, Price).

I understand the eliminativist and reductionist views, but am not sure I understand perspectivalism. If a causal relation between *c* and *e* is real from perspective *p*, is there not an objective relativized fact that *c* causes *e* relative to *p*? But if perspectival notions can be rendered objective by relativization, then any alleged perspectival truth will come with an objective relativized counterpart. The problem of fit with physics will rearise for this counterpart. Perhaps the problem will rearise in a less problematic form, but that would need arguing. At any rate it is not clear to me if the perspectivalist is merely saying that objectively real causal relations have an extra argument place, or if she wants a more radical thesis. Clarification here would be useful.

In summary, this is an outstanding anthology touching on the most fundamental issues in the physics and metaphysics of causation. I only hope that the question of fit, and the consequences of a poor fit, will continue to be discussed so insightfully.

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***Punishment, Compensation, and Law: A Theory of Enforceability***,  
 by Mark R. Reiff. Cambridge: Cambridge University Press, 2005. Pp. x + 272.  
 H/b £52.00.

Reiff, a lecturer in Philosophy of Law at the University of Durham, has written a tight, well-argued book that will appeal to readers who like roaming across diverse areas of law with a functional approach. A little game theory here, deterrence theory there, and some serious thinking about social sanctions and collective action problems, make for very comfortable reading for someone familiar with, and confident in, the power of such ideas. The reader correctly feels in safe hands. The major contribution is an attempt to offer a unified theory of enforcement, and the central problems there are rights that appear to have no remedies, and the fragility of what might be called pre-violation social cooperation. The author is fairly optimistic about the role and power of non-legal sanctions, and it is the integration of these sanctions