In 1912, in the lull between *Principia Mathematica* and the Great War, Bertrand Russell turned a famously iconoclastic eye on the problem of causation:

All philosophers, of every school, imagine that causation is one of the fundamental axioms or postulates of science, yet, oddly enough, in advanced sciences such as gravitational astronomy, the word ‘cause’ never occurs ... The law of causality, I believe, like much that passes muster among philosophers, is a relic of a bygone age, surviving, like the monarchy, only because it is erroneously supposed to do no harm. (Russell, 1913)

Ninety years later, both targets seem to have survived Russell’s attack. The monarchy in question remains firmly in place (Russell having proved one of the lesser trials of a troubled century). And causation still cuts the mustard in philosophy, apparently, despite further threats from new revolutions in physics.

Causation thrives in contemporary philosophy in two senses, in fact. First, the philosophy of causation remains a popular topic—if Russell was right in thinking that causality is a relic of a bygone age, many contemporary philosophers are still living in the past. Secondly, and perhaps more importantly, causation has come to play an increasingly central role in the toolkit of contemporary philosophy, invoked in the foundations of popular approaches to a very wide range of other philosophical topics. To mention a few examples, it is crucial to popular arguments for the identity of mind and brain, central to discussions of free will, action and agency, and often invoked in criteria for realism about particular topics; and it underpins some accounts of epistemic reliability and argument to best explanation, and grounds well-known accounts of many other matters, such as reference, perception, memory and the direction of time.

On the other hand, the issues Russell raised about causation remain unresolved and profoundly puzzling. In particular, there is still no satisfactory account of the asymmetries of causation—the difference between cause and effect, and the fact that cause–effect pairs are (almost?) always aligned from past to future. There has been considerable progress in our understanding of the physics of temporal asymmetry, but to date, at any rate, this has not yielded an explanation of how to ground the causal asymmetries in a physical world of the kind we inhabit.

Thus the issue of the place of causation in the constitution of the kind of reality revealed to us by physics remains both highly problematic and highly important. Taking its point of departure from Russell’s famous article, this volume of essays explores this issue in several directions.

One key theme of the volume turns on the possibility that in presenting philosophy with a stark choice between finding causation in physics and rejecting it altogether, Russell missed an important range of intermediate views. What he missed is what, by a natural extension of his own constitutional analogy, we may call the republican option. In the political case, rejecting the view that political authority is vested in our rulers by God leaves us with two choices: we may reject the notion of political authority altogether; or we may regard it, with republicans, as vested in our rulers by us. Arguably, the republican option exists in metaphysics, too. Causal republicanism is thus the view that although the notion of causation is useful, perhaps indispensable, in our dealings with the world, it is a category provided neither by God or by physics, but rather constructed by us. (From this republican standpoint, then, thinking of eliminativism about
causality as the sole alternative to full-blown realism is like thinking of anarchy as the sole alternative to the divine right of kings.)

Several papers in the volume explore and develop this republican view of causation. The common thought, roughly, is that in looking for causation in fundamental physics, we may be looking for the wrong thing. Causation may be important, both in science and in everyday life, and yet not the sort of thing we should expect to find in physics.

The first four essays (Norton, Hitchcock, Woodward, and Elga) take on Russell’s argument explicitly. Each of these papers endorses, to some extent, Russell’s claim that there is a tension between our usual notions of causation on the one hand, and our theories of fundamental physics on the other. Yet each paper rejects Russell’s conclusion that the concept of causation is of no use.

John Norton begins to clear the way for a republican view of causation by arguing that causal notions should be regarded as part of a false, but approximately true, folk theory. Norton joins Russell in arguing against ‘causal fundamentalism’: the claim that causality is a fundamental part of nature. He argues that unless causal fundamentalism places some constraint on the factual content of scientific theories, it is an empty position. But a quick survey of the history of science, he says, is enough to show that all plausible candidates for such causal constraints (the existence of final causes, no action at a distance, determinism, determination of probabilities) have been violated. To make this point graphic, Norton provides a beautiful example of the failure of determinism even in simple Newtonian mechanics. Norton concludes that the claim that causes play a fundamental role in nature has been falsified by science. But the falsity of a theory, he goes on to point out, does not mean it is useless. A false theory can be very useful in certain domains if, within these domains, the world behaves as if the theory were true. Such is the case with the Newtonian theory of gravitation, or the caloric theory of heat, and such is the case, Norton suggests, with the folk theory of causation.

Christopher Hitchcock, Jim Woodward, and Adam Elga can be seen as adding flesh to Norton’s suggestion by investigating the kinds of physical domains in which the notion of causation is useful, and why it is that causation is useful in those domains. Interestingly, there is a lot of general agreement amongst these authors. In particular they all agree on the following:

1) All three seem to favour (though Elga less explicitly than the other two) an ‘agency’ or ‘interventionist’ approach to causation, which holds that notions of agency or manipulation play an essential role in a philosophical elucidation of the notion of causation. On this view, as Woodward puts it elsewhere, ‘causes are to be regarded as handles or devices for manipulating effects’ (SEP article, 1st line)—and it is the role that the concept of causation plays in means-end reasoning that explains its usefulness, even though the concept may have no place in fundamental physics.

2) Based on this interventionist approach, all three of these authors argue that the concept of causation only makes sense when applied to the kinds of system that Pearl (2000) calls ‘small worlds’—systems that are relatively closed and autonomous, and yet are embedded in a larger world so that interventions into the system are possible.

3) All three suggest that the variables under consideration must be extremely coarse grained, or imprecise, from the point of view of fundamental physics. It is this coarse graining that allows us to divide the world into discrete causal relations, and to identify something less than the entire backward light-cone as causally relevant to an event.
Despite this degree of agreement, these three essays develop their arguments in different directions. Hitchcock is concerned with the implications this picture has for the kinds of questions that we can sensibly ask about causal situations. He argues that careful attention must be paid here if we are not to be led astray by the 'misleading associations' suggested by Russell. Woodward focuses on developing a detailed interventionist analysis of causation and showing how this concept of causation is useful in common sense and the 'upper sciences'. Elga, on the other hand, looks at what it is about the physics of our world that makes possible the kinds of systems in which causation is useful. In particular, Elga argues that the existence of stable coarse-grained systems relies on a certain probability distribution over the initial conditions of the universe—the very same distribution that is responsible for the temporal asymmetry of thermodynamics. Thus, as we shall see, Elga’s article provides a bridge between the papers in the first and last sections of this volume.

As we have already mentioned, the interventionist, or agency, approach to causation is an important element of many papers in this volume. However, opponents of such approaches accuse the view of circularity, on the grounds that agency itself is a causal notion. In his paper in the volume, Arif Ahmed turns his attention to this charge of circularity. He reviews a well-known response by Menzies and Price (1993), argues that it is unsuccessful, and then proposes an alternative response, based on the phenomenology of decision. Ahmed also applies his proposal to the issue of the temporal orientation of causation, and this provides a second link to the last section of this volume.

Consideration of the interventionist approach also leads nicely to a second key theme of this volume, namely the extent to which our causal claims essentially involve a projection onto the world of features of our perspective as deliberative agents. While our first four authors focus on the objective physical conditions that allow causal reasoning to take place, they are all motivated by the need to explain the usefulness of causation for agents involved in means–end reasoning—thus the need for the interventionist approach. Now, some writers (e.g. Hausman 1998) take intervention to be a thoroughly objective notion. (In this form, the view has close links to that of Pearl 2000. See also Woodward 2001). But other proponents of the agency approach (e.g. Menzies and Price 1993) take it to imply that causation is anthropocentric, or a secondary quality. So although our first four authors seem to view causality as an objective notion, their discussion raises that question of the role of the agent’s perspective.

This issue of objectivity is taken up first by Antony Eagle, who develops a counterfactual analysis of causation that is broadly compatible with the common elements of Norton, Hitchcock, Woodward, and Elga. However, Eagle points out that since (as Russell suggests) causation is not reducible to fundamental physics, one might argue that we should not accept causal relations into our ontology. In response, Eagle argues that fundamental physics is not the final arbiter of what ontology we should accept. The acceptance of theories (and hence their ontologies), says Eagle, is a pragmatic matter; theories are accepted for a purpose and from a particular perspective. From the perspective of limited agents such as ourselves, with the aim of planning effective strategies, Eagle claims, the notion of causation is extremely useful and can be legitimately accepted. From a different perspective, fundamental physics is the most acceptable theory. What we mustn’t do, says Eagle, is make the mistake of thinking that the concepts and ontology of one perspective will replace those of the other.

The essays by Helen Beebee and Peter Menzies further develop the idea that the agent’s perspective is essential to the concept of causation, though they take very different directions.
Menzies begins by arguing that the truth of causal judgements is context sensitive. Looking at a single situation from different contexts, he says, we may legitimately make different judgements about what causes what in that situation. This is true, he argues, even if we do not change our mind about the objective structure of physical events and relations in that situation. In support of his claim, Menzies develops an analysis of context dependent causal claims based on the theory of causal modeling put forward by Pearl (2000) and argues that this analysis correctly deals with numerous examples of apparent context-variability. Given that the truth of causal claims is not determined by the objective physical features of a situation, Menzies concludes, with Russell, that causal facts cannot supervene on objective physical facts. However, like Eagle, Menzies cautions us against hastily following Russell to the conclusion that causation has no place in an objective account of reality. Menzies hints at another option, which he calls perspectival realism. The perspectival realist accepts the perspectival nature of causal claims yet holds that causal relations are a genuine part of reality nonetheless.

Beebee gives the volume a historical twist by suggesting that Hume is best interpreted as something like a causal republican. Following a suggestion made by Simon Blackburn, Beebee advocates an interpretation according to which Hume could be described as holding a quasi-realist projectivist position on causation. The position Beebee ascribes to Hume is characterised by three claims: (i) Statements about causal connections do not have representational content, rather they are expressions of our inductive commitments. (ii) Nonetheless, because of the role that these inductive commitments play in our cognitive lives, it is quite legitimate to treat causal statements as propositions that can be objects of belief, knowledge, truth, and falsity. (iii) Once we acquire these inductive commitments, they change the nature of our perceptual experience, so that we really do perceive the world as containing causal connections. Thus, as well as turning the standard interpretation of Hume on its head, Beebee presents us with an alternative way of seeing causation as something that is projected onto the world by deliberative agents.

Huw Price also takes up the question of objectivity, but considers, in particular, the objectivity of the temporal asymmetries that seem to be associated with causation. Thus Price leads us into the third major theme of this volume. This theme concerns the connections between three clusters of temporal asymmetries: (i) the modal asymmetries of cause and effect and of counterfactual dependence; (ii) the decision-theoretic asymmetries of knowledge and action; and (iii) the physical asymmetries associated with the second law of thermodynamics. There are good reasons for thinking that these three clusters of asymmetries are intimately related, but wide differences of opinion about the nature of the connections.

Price argues that the modal asymmetries are perspectival—features of the world as it looks from the viewpoint of creatures characterised by the decision-theoretic asymmetries, rather than of the world in itself. The role of the physical, thermodynamic, asymmetries is to make possible the existence of such creatures. On this view, the temporal orientation of causation reflects that of agents (here connecting again with some ideas in Russell’s paper), and this provides one clear sense in which causation is less than fully objective—differently oriented creatures, in a region of the universe in which the thermodynamic asymmetry had the opposite orientation, would regard it as having the opposite direction, and neither view is objectively correct. Price appeals to this argument, among others, to argue that only the perspectival view makes good sense of the key role of intervention in an account of causation.

In opposition to Price’s position is the view that the modal asymmetries of causation are objective, and reducible to (or explicable in terms of) the physical asymmetries—which, either via this route or directly, perhaps also supports the decision-theoretic asymmetries. This view has affinities with that of David Lewis (1979), and is also related to those of Papineau (1985), Ehring
(1982) and Hausman (1998). However, it is vulnerable to criticisms of the kind raised by Price (1992a), Field (2003), Elga (2000), Frisch (REF) and others. The view has recently surfaced in a new form, claimed by its proponents to evade the problems facing Lewis’s account. The new variant, drawing on work by Albert (2000), and developed most thoroughly by Kutach (2002), accords a crucial role to fact that entropy is very low in the past. This objectivist view is developed in this volume by Barry Loewer and Douglas Kutach, and is criticised by Mathias Frisch.

Based on considerations of statistical mechanics, Leower argues that our generalisations about the macroscopic evolution of the world presuppose both that the early universe was in a state of very low entropy and that there is a uniform probability distribution over the microstates that could realise a given macrostate (here we see the close connection to the paper by Elga). To be consistent with our generalisations about the macroscopic world, then, we should also hold fixed these two presuppositions when evaluating counterfactual claims. If we do this, Loewer argues, Lewis’ analysis will indeed give rise to an asymmetry in counterfactual dependence.

Kutach also identifies the assumption of a low entropy state of the early universe (which is not balanced by the symmetric assumption that the late universe is also in a low entropy state) as the source of causal and counterfactual asymmetries. In this sense, Kutach is in agreement with Loewer, and in opposition to Price. Yet Kutach points out that asymmetry is only one aspect of our notion of causation. Another important aspect is the idea that causes determine, or necessitate their effects. However, he argues, determination is only a feature of the objective world at the micro-scale, and at this level of description, the entropic asymmetry plays no role. Thus our concept of causation relies on mixing up the micro- and macro- levels of description, and does not correspond to any objective reality. In the end, then, Kutach seems to agree with the more general republican claim that our concept of causation can only be justified pragmatically.

Frisch argues that attempts, like those of Loewer and Kutach, to base causal asymmetries upon thermodynamic asymmetries are unlikely to succeed. He has no quarrel here with the claim that we must hold fixed the hypothesis that the early universe was in a state of very low entropy. However, Frisch questions whether this constraint does actually lead to an asymmetry of counterfactual dependence between the past and the future. On the one hand, Frisch argues that the constraint is not strong enough to generate the asymmetry of counterfactual reasoning. On the other hand, he argues that if the constraint were strong enough it would lead to the counter-intuitive claim that records of the past are more reliable than any inference we might draw from the present macro-state of the world together with the laws of nature.

The essays in this volume thus exhibit a considerable degree of agreement. Almost all our authors agree with Russell that causation is not to be found in fundamental physics. Yet all disagree with Russell’s conclusion that the concept of causation is therefore useless. There is also some consensus that the way to reconcile these two positions is to explain how it is that causal concepts are useful in the deliberative lives of agents like us (hence the prominence of interventionist approaches). Thus, in some sense, most of the papers in this volume have republican sentiments. Where our authors disagree is on some of the details. What exactly are the objective facts (about the world, and about us) that account for the usefulness of our causal reasoning? And accordingly, which features of our concept of causation reflect objective features of the world, and which are merely projected onto the world (even if on the basis of objective features of ourselves)? In particular, how are we to understand the temporal characteristics of causation, in this framework?
Price notes that in treating our modal categories as products of our perspective as knowers and agents, the perspectival view is neo-Kantian or pragmatist in character. In other words, it is a republican view, in the sense outlined earlier. Given the apparent centrality of causal and counterfactual reasoning in science and everyday life, a successful defence of this view, informed by contemporary understanding of the physics of time asymmetry, would be an important victory for a neo-Kantian metaphysics.

In view of the centrality of causation in contemporary metaphysics, moreover, the battle over causation cannot remain a regional skirmish. A republican victory here would be a real revolution in philosophy—even if only Kant’s Copernican revolution, rediscovered and reinvigorated by our new understanding of our place in the temporal world revealed to us by physics. Hence, we think, the great importance of the issues discussed in this volume. Few issues in contemporary metaphysics are so central and so timely.

**BIBLIOGRAPHY**


