Review of Max Kistler, *Causalité et lois de la nature* Paris: Vrin 1999, 311 pages, FRF 198

(published in *Dialectica* **55** (2001), pp. 181–184)

Max Kistler's first book, based on his Paris Ph.D. thesis, is an elaborate defence of a transference theory of causation. Such a theory conceives of causality as the transfer of a conserved quantity. A transference theory of causation is thus one form that a regularity account of causation, as opposed to a counterfactual account, might take. Kistler's original contribution consists (a) in the way in which he develops an account of causation based on transference and (b) in relating a theory of causation to a specific view of natural laws.

Kistler first considers what a relation of causation is and thereby contrasts the transference theory with other explanations (Ch. 1). He then develops a view of natural laws (Ch. 2) and combines this view with his transference theory of causation (Chs. 3 & 4). The second part of the book focuses on causally efficacious properties. Kistler employs the notion of properties that are responsable for a relation of causation. The function of such properties in laws of causation is examined (Chs. 5 & 6). The last chapter discusses examples that are to show how this theory of causation works (Ch. 7).

Kistler argues for a realistic view: there is causation in the world independently of whether and how people conceptualize causal relations. The relata of a causal relation are events. An event is the content of a continuous space–time region (which may be as small as being point-like) (18, 64–68). Events are in space–time what objects are in space (196): An object has spatial parts, whereas an event has spatio–temporal parts. To give an example, a volcano has spatial parts such as a top, whereas an eruption of a volcano can be gentle and limited to its northern side first and then become violent and extending to all sides. There is a relation of causation between two events if and only if at least one conserved quantity is transferred between them (39–40, 100). That is to say: an event *x* has a certain value of a physical quantity, and that individual value is transferred to another event *y*. The foremost example of a conserved quantity is energy. Physics discovers the quantities that are conserved.

The relata of a causal relation are thus particulars. However, they enter into causal relations in virtue of certain of their properties, namely conserved quantities. According to Kistler, the properties that make it the case that events are causally related are intrinsic properties. All and only intrinsic properties have the capacity of being causally efficacious (221–234). Kistler prefers a trope theory of properties: properties exist as abstract particulars instead of being universals or instantiated universals (80, 129). Consequently, causation involves only particulars. Nonetheless, Kistler's transference [182] theory of causation is not logically committed to an ontology of tropes: one could defend that very theory in combination with an ontology according to which conserved quantities are universals.

Saying that events are the relata of a causal relation in virtue of certain of their properties enables Kistler to take the following into account: the descriptions of events are not merely extensional. Only some of the many possible descriptions of two events that are causally related bring out the causal connection. For only some descriptions pick out those properties in virtue of which events stand in a relation of causation. Kistler describes these properties as being responsible for the relation of causation (193–194). That an event has a property in virtue of which it stands in a relation of causation to another event is a fact about that first event. These facts – and thus the properties that are responsible for a causal relation – are independent of our descriptions. Causal explanations refer to such facts in the first place: these are the truth-makers of causal explanations (Ch. 5). Facts in this sense are universals, and they have a propositional structure. But the ontological bedrock consists in particulars (events) that are composed of particular property instances (tropes). Causation, for Kistler, thus has two aspects: The ontological one of relations between events – in virtue of certain of their properties – and the epistemological one of explanations that are made true by facts.

A transference theory of causation is a version of a regularity theory of causation: conserved quantities are tied to laws of conservation. Every instance of a relation of causation is an instance of a law of conservation. Causal relations require for Kistler strict laws in the sense of laws that do not admit of exceptions (Ch. 3 and pp. 178–179). In the case of a causal relation we are entitled to the following generalization: If there is an event that is *F*, then there is another event that is *G*. The known conservation laws are symmetrical with respect to time reversal. According to Kistler, asymmetry enters only on the level of the particular instances of the causally efficacious properties. It is due to the particular network in which these properties occur (100–101). Asymmetry does not imply that the cause comes before the effect: for Kistler, it is a question of physics whether there is backward causation (32 note 1, 50–51). But there is no such possibility of simultaneous causation: the transfer of a conserved quantity between two distinct events takes time, however little that time may be (57–64). This account differs from a traditional regularity theory of causation by not reducing causation to the instantiation of a law. The physical laws that we know, including conservation laws, are symmetrical, whereas causation is asymmetrical.

Kistler’s conception of causation requires that conservation laws are strict laws. According to the general view of laws that he puts forward, however, a natural law that connects two properties *F* and *G* does not imply the generalization that everything that is *F* also is *G* (Ch. 2). The reason is that there may be circumstances that prevent the property *G* from being instantiated such as other properties interfering. Laws can hence have exceptions. Exceptions are not due to the laws as such, but to the circumstances in which the instantiations of the properties to which a law refers occur. Kistler claims that this view is more plausible than a qualification by means of a *ceteris paribus* clause: Whereas a *ceteris paribus* clause does not admit of a clear specification, it is possible to spell out the circumstances in which particular property instantiations occur and to make clear which circumstances prevent the lawlike connection between two or more properties from being instantiated (128–129). In particular, exceptions to a law can thus be explained by referring to other laws. Again, however, Kistler’s transference theory of causation is not committed to this view of laws.

[183] A transference theory of causation seems to be tied to physicalism: Causation is transfer of a conserved quantity. Our basic physical theories identify these quantities. Nonetheless, Kistler refuses to subscribe to physicalism in the sense of the epistemological claim that all scientific theories can be reduced to microphysics. He defends naturalism in a broader sense: there are not only microphysical laws and microphysical properties. Macroscopic laws and properties are also admitted – independently of whether or not it may turn out to be possible to reduce them to microphysical ones (287–292).

However, Kistler is not only committed to a naturalism in this weak sense. His theory has more specific implications: conserved quantities are identified in basic physical theories (such as quantum mechanics, electromagnetism, and relativity). Thus, if causation is transfer of a conserved quantity, then every causal relation is realized as a relation that can be described in terms of the concepts and the laws of a basic physical theory. This commitment does not imply the epistemological claim that it is in principle possible to reduce all scientific concepts and laws to the concepts and laws of basic physical theories; the laws and concepts that describe relations of causal responsibility among macroscopic properties may not be reducible to the laws and concepts of basic physical theories. But this position implies a sort of ontological physicalism or reductionism: insofar as macroscopic and common sense properties are causally efficacious, they are realized as an arrangement of basic physical properties.

What are the broader implications of Kistler's position for the metaphysics of causation? First of all, there is a commitment to naturalism or physicalism in the philosophy of mind as well: if there is mental causation, mental properties that are causally efficacious have to be realized as physical properties to which conservation laws apply. More important than this consequence for the philosophy of mind is the issue of the scope of a transference theory of causation. If a theory of causation in terms of a transfer of a conserved quantity were intended to be a conceptual analysis of what causation is, such a theory would imply that in all possible worlds causation is transfer of a conserved quantity. Such a position would provoke the following objection. Even if one grants that causal relations are realized as transfer of a conserved quantity in our world, there is no reason to conclude that causation is conceptually tied to the transfer of a conserved quantity. Kistler does not draw such a conclusion. He limits his proposal to the claim of empirical validity (18, 39). Thus, a transference theory of causation tells us merely in which manner causal relations are realized in our world. This is a considerable restriction of the scope of the theory of causation that Kistler proposes. His theory does not meet the requirement of a metaphysics of causation. If there are different realizations of causation in different possible worlds – one of which is the transfer of a conserved quantity – then the metaphysical question is: What makes it the case that all these different realizations are realizations of *causation*?

Kistler fully discusses the problems of a transference theory of causation. He considers both the different versions of such a theory that exist in the literature as well as alternative proposals. But he mentions his preferred view of properties as tropes only briefly. This is acceptable; for the defence of a trope theory of properties would be a matter for another book. Kistler explains what conserved quantities are (75–80, 90–93). However, one would like to learn more about them. If they are transferred between distinct events and thereby remain one and the same, what exactly are their conditions of identity and individuation? Furthermore, Kistler merely touches upon the broader discussion between friends of a regularity account of causation and friends of a counterfactual account (such as, notably, David Lewis). A more elaborate discussion of the [184] relationship between a transference theory of causation and a counterfactual account in particular would have been desirable – especially against the background of the conceptual limits of a transference theory mentioned in the preceding paragraph. For instance, it is not obvious why someone who defends a counterfactual account of causation as a conceptual analysis of what causation is should not be able to grant that, as a matter of fact, all causal connections between events in our world are realized as a transfer of a conserved quantity. So what is the position of a transference theory of causation, limited to empirical validity, in the big field of the metaphysics of causation? With which metaphysical positions is it compatible, which ones does it exclude, and which ones does it suggest?

Further work remains to be done here. These points notwithstanding, it should be said that it is a pleasure to read Kistler's book and that its argument is very well developed. It is a remarkable example of the standards of clarity and precision that are achieved in today's analytical philosophy of science.

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