Abstracts for the CauSci conference 15.09.-17.09.2014

Causation in Science: powers, mechanism, singularism

John Heil - Causal Production

Causation occurs when something brings about something else. Not everyone agrees. Some philosophers hold that causation is solely a matter of events' falling under generalizations, or being instances of laws, or answering to some true counterfactual or subjunctive conditional. I argue that an ontology of powers provides the resources to explain a robust notion of causal production and that this provides the basis of talk of causal laws, true counterfactuals, and the like, rather than the other way round.

Flavia Fabris – Beyond Waddington's Epigenetics: Canalization and Adaptive Plasticity

Contemporary researches that focus on genetic assimilation has provided empirical evidences for the role of canalization as mechanism of evolutionary development.The processes responsible for the phenomena of phenotypic plasticity draw attention to the fact that the causal complexity that biological systems manifest, need some kind of regulatory activity to be explained. So far, however, in evolutionary biology little has been said about an adequate ontological account of processes that fits the current understanding of the causal role of genomes in the mechanisms of inheritance. According to Mumford and Anjum, an adequate understanding of what genes do in biology requires acknowledgment of complexity and context-sensitivity as two key notions emphasized in their causal dispositional account. The talk will present how a dispositional interpretation of the mechanism of canalization may offer positive insights on the causal processes underneath the organism/environment feedback regulation.

Maria José Garcia Encinas – On Singular and External Causality: A Defence

That causality is external means that the nature of the terms in a causal relation is not their contribution to causation. So causality is something other than its terms. This thesis has been challenged by causal theories of properties. I offer two main reasons for causal externalism: that causes come in bundles, and the asymmetry of causation, and thus I argue that causal theories of properties cannot be right.

Fredrik Andersen - Relativistic Spacetime as a Principle Theoretic Stepping Stone

Einstein (1919) claims that relativity theory provides no ground for an understanding of space and time. The reasons for this are: The analytic method used in arriving at the conclusions and; the

postulated dualism between the measuring apparatus as "rigid objects" and 'everything else'. We side with Einstein and argue that relativity theory is best understood as a stepping stone toward a full theory of spacetime similar to Copernican astronomy. The talk will be a summary of the arguments presented in the paper.

Andrea Raimondi – The Composition of Powers - An Amendment to the Vector Model

In "Getting Causes From Powers" Mumford and Anjum suggested a way to model powers' composition by the use of the Vector Model. The theoretical assumptions of the model, however, fail to convey a clear understanding of the nature of the connection between components and resultant. This difficulty related to the model give rise to the hypothesis that no real composition occurs. In this paper I suggest to revise one of this assumption, that I call the Principle of Uniqueness of Powers Composition (UPC). By rethinking this assumption, I argue that composition, on the contrary, is real and effective, but that the nature of the powers' composition, rather than being mereological, is functional. By demonstrating that composition that occurs between powers cannot be characterized according to principles of extensional mereology, I suggest that composition is better understood starting from the functional characterization of powers in a context of interaction. By assuming this strategy I demonstrate, using the same Vector Model, that the way powers are arranged has important effect on the whole they compose and that this effect, that account for the emergence of high-order powers, can only justified by assuming that both components and resultant are real and irreducible.

Ruth Groff – What Exactly is a Causal Mechanism Again?

My comments will be culled from a longer paper in which I address the recent literature on causal mechanisms in sociology & philosophy of social science. In the full paper I begin by establishing a contrast between passivist theories of causation and productive, anti-passivist theories of causation. In setting out each type of approach, I identify both how causation itself is defined from that perspective and what a cause must be like, given the definition. I then turn to the notion of a causal mechanism as it has been deployed at the level of social science, with the dual aim of (a) illustrating existing confusion surrounding the term; and (b) raising the question of whether or not, even adequately conceived, the concept of a causal mechanism adds anything to the categories of causal power, causal bearer and causal process. Given that many of the participants in the conference are metaphysicians, I will focus on the issue of what, exactly, a causal mechanism might be, other than a powerful cause or a (powerful) causal process.

Max Kistler – Constitution and Causation in Mechanistic Explanation

A mechanism is a structure underlying the regular and reliable occurrence of a causal process. Understanding the mechanism and the causal process requires 1) analysing the structure in its components, 2) identifying the causal interactions between these components and 3) showing how these interactions achieve the transition from the mechanism's input to its output. Craver (2007) suggests that experimental techniques for investigating relations of both causation and constitution can be analysed in the framework of the interventionist account of causation. This requires modifying Woodward's (2003) conditions on interventions and causation. The modification yields an analysis of a general dependence relation, of which constitution and causation are subtypes. In this paper, I explore whether the concepts of specificity, proportionality, and stability, which have been used to distinguish different types of causal relations, can also be applied to constitution, such as, e.g., the relation between a protein and its constituent amino acids.

Mauricio Suárez – Propensities and Conditionals

What are propensities? I first quickly review the argument for opposing a reading of propensities as objective conditional probabilities. However, it is well known that the probability of a conditional is not generally the probability of the consequent conditional on the antecedent. So I canvass, and raise an array of different objections to, a number of proposals for an analysis of propensity ascriptions as conditional statements with probabilistic statements in the consequent.

Anna Marmodoro – Powers, Structures and Laws of Nature

This paper argues that the mechanism of movement and change in the world we live in, e.g. a being repelled by an opposite charge, can be explained in terms of the essences of the fundamental powers that make up the world. On the other hand, which types of change take place (even focusing only on changes that follow regular patterns and ignoring chance events), cannot be fully explained by the essences of powers. Such types of change, such as biological generation, require structure too, for a full explanation of the phenomenon. The paper argues that structure is not power. It further shows that structure derived from spatio-temporal relations, in the course of the unfolding events in nature; but that structure differs from spatio-temporal relations. Finally structure grounds the laws of nature in our world, which are needed in addition to the essences of powers in order to explain physical and biological phenomena in nature.

Jennifer McKitrick – Mechanistic versus Dispositional Explanations in Science

It is sometimes claimed that mechanistic explanations are superior to dispositional explanations. This is a false dichotomy. Dispositional explanations can appeal to mechanisms, and mechanistic explanations are not devoid of dispositional concepts. Consideration of a dualist account of mechanisms and a pluralist account of dispositions shows how appeals to mechanisms and dispositions can be complementary.

John Symons – Carving causes at the Joints

Donatella Donati – A Sketch of a Process Theory of Causation

According to prominent theories of causation, causation is a relation between two distinct entities. This kind of approach seems to generate at least two problems. First of all, it seems that it does not respect our intuitions. We perceive causation as something continuous and don't experience causal connections as something over and above the world itself. Secondly, causation is supposed to be the glue between two static entities. But why do we need an extra element? In respect to these concerns, a better way to capture causation is to consider it operating via an ontology of processes. A process is an unfolding interaction of powers, and all properties are clusters of causal powers. These properties are tendencies towards certain types of outcome - their manifestations (a cause disposes towards a certain type of effect). Therefore, causation occurs when powers manifest themselves and effects are always produced by many powers acting together. The world is a huge network of causal processes, which are parts of something much larger, of a unique big causal process: the whole universe. I will explore whether, on this model, metaphysical causation always identical to metaphysical change, and what relation links time and causation.

Jon Williamson – Causation in Systems Medicine: Epistemological and Metaphysical Challenges

Systems Medicine is a promising new paradigm for increasing the rate of progress in medicine. But it poses some tough challenges for those concerned with causal inference. This paper will put forward some epistemological challenges that arise from both the use of big data and the use of evidence of mechanisms in systems medicine. Systems medicine also serves to highlight the challenge of producing a viable metaphysical theory of causality that can account for the use of causality in medicine. I will give some suggestions for meeting these challenges, and I will discuss the place of powers in the metaphysical solution that I propose.

Aldo Filomeno – A Landscape of Metaphysical / Scientific Images of the Fundamental Dynamics

I reflect upon which requirements, if any, should be met by a theory to be considered as fundamental. Some criteria, naturalness and simplicity, are shown to be inconsistent with certain aspects of our best physics. In front of this tension, I defend the plausibility of an alternative metaphysical worldview alongside the existing ones. In a nutshell, one that takes at face value the complexity and unnaturalness and postulates a higher degree of (dynamical) complexity in the fundamental level. This has a bearing upon the philosophical discussions about physical necessity and laws of nature.

Rani Lill Anjum and Stephen Mumford – Methodological Pluralism and the Methods of Scientific Discovery

A number of methods are used to established causation. Different sciences favour different approaches, and some sciences use multiple methods. But do the different methods discover the same thing, namely causation? Or do they discover a number of different things, such as statistical correlations, difference making, probability-raising or causal mechanisms? Perhaps causation could be all these things. This would support a pluralistic notion of causation and at least it would mean that the different types of causation are all reconcilable. Otherwise we might find that two different methods could be used for opposite evidence: to establish and deny the same causal relationship. If our methods provide us with contradicting results, we need a way to choose between them. Here we give support to a single, uniform theory of the nature of causation. The suggestion is that although there is only one thing that is causation, because it is not reducible to anything else, there isn't one single, infallible way of uncovering it. There are, however, a variety of methods we can use, all of which have some weakness. They detect slightly different things, such as regularity and difference making and whether there is a plausible mechanistic theory. But these are all symptoms of causation rather than causation itself. And epistemically, in attempting to uncover causes, the best position to adopt is a methodological pluralism.