

Modally rich metaphysical landscapes

Programme and Volume of Abstracts

Kraków, June 9-10

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1 Marius Backman: No time for powers

In this talk, I will argue that the neo-Aristotelian powers view which claims that at least some properties have an inherently active and dynamic dispositional character is not compatible with any prominent temporal ontology. First, I will review an argument towards the incompatibility of the powers view with eternalism. According to this argument, it is the inherently active and productive character of powers that renders it incompatible with eternalism, which is supposed to be a static view of time. I will go on to argue that this inherently active and productive character of powers also makes the powers view incompatible with the growing block view, as well as with presentism.

2 Claudio Calosi: Quantum indeterminacy

Among the perplexing aspects of quantum mechanics is its seeming, on a wide variety of presently live realist interpretations, to violate the classical supposition of 'value definiteness', according to which the properties—a.k.a. 'observables'—of a given particle or system have precise values at all times. On the interpretations in question, the indeterminacy in such cases is taken to be metaphysical, not merely epistemological, much less semantic. Here we consider whether two recent approaches to metaphysical indeterminacy—a metaphysical supervenient account, on the one hand, and a determinable-based account, on the other—can provide an intelligible basis for quantum value indeterminacy (henceforth: quantum MI). We start by identifying three sources of quantum MI, as operative in cases of superposition, incompatible observables, and entanglement. We then provide new arguments in needed support of the claim, in Darby 2010 and Skow 2010, that metaphysical supervenientism cannot accommodate quantum MI, which arguments show that concerns with a supervenient treatment extend far beyond its failure to accommodate the orthodox interpretation in light of the Kochen-Specker theorem. We go on to argue, in ways touching base with Bokulich 2014 and Wolff 2015, that a determinable-based approach can accommodate each of the different varieties of quantum MI. We conclude by observing the positive mutual bearing of our results on the coherence and intelligibility of both quantum mechanics and metaphysical indeterminacy.

3 Balazs Gyenis: Humean branching, objective modality for Humeans, and physical possibility as epistemic possibility

The talk is a three-pronged provocation of my Krakow friends regarding philosophical issues surrounding modalities. I start with sketching out different notions of physical possibility and their relationship to different conceptions of laws of nature. I then point out an inherent weakness of the Humean approach to laws but argue that this same weakness allows us to give a Humean interpretation of branching spacetimes—the apparent objective modality of BST could hence be understood "Humeanly". On the flip side I argue that a Humean approach to laws can give rise to a notion of physical possibility which (albeit not without some tensions) seems compatible with objective modality. To the extent time permits I will finally start to develop and argue for a notion of physical possibility which essentially reduces to epistemic possibility and hence leaves no space for objective modality, Humeanly or traditionally understood.

4 Katarzyna Kuś: Justification of modal beliefs—Sources and limits of knowledge on necessity and possibility

The problem of modal knowledge can be formulated as a trilemma where we have a choice of three intuitive statements, each separately appealing and yet jointly inconsis-

tent:

1. We have knowledge (true, justified beliefs) on modal properties of objects.
2. Knowledge of the external world is acquired through causal relationships between the subject and the world.
3. Knowledge acquired through causal relationship cannot surpass the actual (non-modal) objects properties.

Although it is impossible to defend all the three statements at the same time, it is possible to reject one of them and accept the remaining two. Rejection of thesis 1 results in taking a skeptical position in relation to modal knowledge. Someone who is convinced that we have modal knowledge or at least well-justified modal beliefs, has two possibilities. Modal rationalist accepts the theses 1 and 3, rejecting the second one. A proponent of modal empiricism proclaims the first two theses, disagreeing with the third one. The question whether to reject the thesis 2 or the thesis 3 is in fact a dispute about whether modal knowledge is a priori or a posteriori knowledge in principle.

Two problems of modal epistemology will be at the center of my presentation:

1. What can one and what cannot one know, that is what kind of propositions can be the subject of knowledge? (the demarcation problem)
2. How do we gain and how should we gain knowledge? (the method problem)

On the other hand, I will try to bypass, at least partially, the problem of skepticism, which is perhaps central to the whole epistemology. I will be more interested in the extent to which our justification for modal beliefs can be rational and to what extent we have a reliable basis for sustaining them, but less the possibility or inability of modal knowledge. I will show which of the proposed ways of reaching modal knowledge raises more doubts and which - less.

In the literature, there are two basic concepts of the answer to the question on ways of justifying modal beliefs. First, it is an analysis of intuitive cognition, modeled in a similar way to cognition in mathematics. Intuition justifying modal beliefs would be closely related to detecting the contradiction between a set of accepted sentences and a modal statement. The second group of concepts is centered around concepts of imaginability and conceivability. They are related to the thesis that if it is imaginable/conceivable that p , then it is also possible that p , and if it is not imaginable/conceivable that p , then it is impossible that p , i.e. it is necessary that $\neg p$.

Rationalism is a leading position in modal epistemology, and the main research effort of epistemologists is aimed at such a view of necessary a posteriori propositions to ensure modal cognition that is a priori. I will claim that there is no one way to justify modal beliefs, and that we have several different strategies for justifying them. This is a theory that points to empirical sources of such knowledge and to reasoning through analogy.

I propose the division of positions in modal epistemology into symmetric and asymmetric theories. The theories from the first group postulate two different cognitive powers - one responsible for exploring the possibilities, the other - for getting to know

necessities. Asymmetric theories accept that the system of modal beliefs is based on one kind of base model propositions, depending on the specific solutions either on necessary propositions or on possible propositions. On the basis of propositions with primary modality, due to appropriate inferences, we discover the value of propositions with secondary modality. These positions, regardless of which of the modalities they postulate as fundamental, must fulfill a number of conditions in order to understand the structure of modal beliefs.

In the talk, I will examine ways of obtaining rational modal beliefs. I will show that, contrary to many stands, there is no one way to justify them. Due to their diverse character and different, mutually irreducible types, we have several strategies of justification available. They are local in character and do not allow to justify a substantial part of the accepted beliefs about the possibility and necessity. The position I propose is neither explicitly empirical nor strictly rational. According to it, the choice of empirical or rationalistic strategy depends on the type of sentence to be justified.

5 Joanna Luc: Are different laws of nature necessary in different ways?

In the philosophy of modality there exist the idea that this notion is not homogeneous and therefore there are different types or degrees of modality, in particular of possibility and necessity (e.g. Fine 2002, Williamson 2016). There is no agreement what types exactly there are, but the most often mentioned are logical, metaphysical and natural necessity/possibility. The last one is connected with laws of nature—what is implied by them is naturally necessary. One may ask the question whether we can reasonably “divide further” the natural modality, i.e. distinguish different types of it connected with different types of laws of nature. In my talk I will consider four attempts to draw such a distinction, which I find unsatisfactory, and then I will sketch my own proposal.

The four attempts which I criticize are as follows:

1. if one law of nature implies the other (in the logical sense), then the second one is more necessary than the first one,
2. if scientists use some law to explain or derive the other, then the first one is more necessary than the second one,
3. Lange’s idea (1999, 2000, 2005, 2007) that more necessary laws are more stable under counterfactual suppositions (in his technical sense of stability),
4. Wolff’s idea (2013) that according to some physical theories conservation laws are more necessary than dynamical laws.

My own proposal is based on the observation that “typical” examples of laws of nature (at least in physical sciences) take the form of mathematical equations. They are often non-adequately treated by metaphysicians as something autonomous, but in fact they require the whole mathematical formalism (like differential geometry) in order

to be formulated at all. And applicability of this formalism to physical phenomena is non-trivial fact about nature, which is not captured by any ordinary law, is more basic than holding of any of these laws, and is something essentially different from mere mathematical truth. This suggests that such truths may be regarded as higher level of natural necessity.

6 Thomas Müller and Tomasz Placek: Branching space-times after 25 years: New foundations

25 years ago Nuel Belnap proposed the theory branching space-times (BST), a framework for non-Humean metaphysics, agency, and philosophy of science. Since for non-Humeans some modal entities, like modal facts, potentialities, or possibilities, are irreducible furnishing of our world, non-Humeans face a challenge to explain how these modal entities interrelate with temporal and spatial features of our world. The first task was achieved, in the branching traditions, by A. Prior's (1967) branching time, the second—by Belnap's (1992) BST. A remaining problem is to explain how BST events are to be assigned spatio-temporal coordinates, which is very much needed to understand how objects continue to exist or how they move. Addressing this “coordinatization problem” is required to draw a bridge between BST and physics of space and time. Perhaps there are different ways of approaching the coordinatization problem, yet we follow an established method of physics that calls for producing a locally-Euclidean manifold as the representation of the set of spatiotemporal events. The original axioms of BST, however, prevent BST models from being locally Euclidean, the exception being trivial one-history models. That is, if there are two (or more) histories in a model, they split at choice points, and it is impossible to map a neighborhood of a choice point onto an open set of reals. We thus propose a new prior choice axiom which says that histories split at pairs of points; we develop the resulting theory accordingly. We prove a number of topological facts about BST models and histories with respect to a natural topology for BST (i.e., Bartha's topology). These theorems exhibit a certain pattern, as they roughly say: if all histories in a BST model are topologically nice, so is the whole BST model. A pertinent example is this: if all histories of a BST model are locally Euclidean, the BST model is locally Euclidean as well. The moral of these findings is that if physics comes with topologically unproblematic space-times, the BST modal structure built on these space-times is topologically unproblematic as well.

7 Antje Rumberg: Time for powers

In my talk, I will present a dynamic, modal explanation of branching time models for real possibility in terms of potentialities. The crucial idea is this: by manifesting their potentialities, objects become causally efficacious and jointly give direction to the possible future courses of events. A rigorous formal characterization of potentialities and their manifestations will be provided, and it will be shown how that conception of potentialities allows us to lift a branching time model for real possibility from a single momentary circumstance in a dynamic fashion. What is crucial to our approach is

that we uncouple the manifestation of a potentiality from what turns out to be the case if the potentiality is manifested. The manifestations of potentialities are conceived of as transitions toward the future: they are initial-outcome pairs that capture local change. By modeling the manifestations of potentialities as transitions, we bring a dynamic element into the picture and make room for interventions and omissions. Our approach allows for a trifold distinction between the manifestations of potentialities, their individual outcomes and what eventually turns out to be the case. Branching time models for real possibility are ultimately grounded in the potentialities of objects and the interaction of their manifestations. The result is a limited kind of indeterminism.

8 Dawa Ometto: Powers and emergence

TBA

9 Niels van Miltenburg: Manifestations as processes, powers as formal causes

Traditionally, realists about powers hold that a power is a property that necessitates its manifestation when it is triggered. But cases of manifestation prevention (finks, masks and antidotes) present a problem for this view. They seemingly show that there are situations in which a power can be triggered but nevertheless fail to manifest. In this problem some have seen cause to abandon realism about powers altogether, others (e.g. Schrenk, Mumford and Anjum) have argued that powers bring a *sui generis* dispositional modality to the world that is somehow weaker than full-fledged necessity but stronger than mere possibility. I will argue that necessity can be saved if philosophers stop thinking about trigger and manifestation as separate events. Instead, we should think of manifestations as processes that have triggerings as their starting points. On this alternative view, interference between trigger and manifestation becomes conceptually impossible and the famous cases of finks and antidotes can be unmasked. The remainder of this talk is concerned with the nature of processes and with how processes are different from events. Crucially processes have a modal profile—a process can become longer, larger, and can withstand certain other changes. But what makes up the unity of a process? I will suggest that this question can start to find an answer if we think about powers as the formal causes of processes.

10 Jacek Wawer: Branching time and modal neutrality

The model of so-called Branching-Time was introduced by Saul Kripke and Arthur Prior to investigate indeterminism and temporal asymmetry between “settled” past and “open” future. The model was often adopted for various formal (primarily semantic) purposes, but the proper philosophical interpretation of the model was often highly underdeveloped. The purpose of the paper is to fill in the interpretative gap.

I first observe that it is highly misleading to assume that the structure represents the branching of time. Such interpretation is open to many common sense and scientific objections. I argue that it is much more reasonable to understand the structure as a representation of branching temporal possibilities.

I then propose an interpretation of the structure in fashion of genuine (or extreme) modal realism of David Lewis. In this view, it is composed of non-modal and tense-less events, which can be “modalized” and “tensed” only when a particular temporal and modal location is distinguished. I argue that many claims of branching theorists suggest metaphysical primacy of such “external” account of reality. In particular, their insistence that no particular modal viewpoint is privileged—which I call modal neutrality—can be readily understood, if we accept such approach.

I propose, however, an interpretation of the branching structure that weds modal neutrality with fundamentally modal nature of reality. I base my solution on the non-standard tense realism (or non-standard A-theory) proposed by Kit Fine.