

METAPHYSICS OF SCIENCE



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Timetable | Saturday, 12 Sept

9:00 - 10:30	Arrivals and Registrations (Registration possible in all major breaks)			
10:30 - 10:45	Welcome Address			
10:45 - 12:00	H. Beebee Natural Kind Essentialism			
Coffee Break (15min)				
12:15 - 13:00	S. Gozzano [MN] Scientific Essentialism and the Mind [k]	A. Bird [FL] TBA	S. Barker [RS] Necessary Connections between Distinct Existences and Physical Modality [m]	A. Sloman [MH] Virtual Machines and the Metaphysics of Science [o]
Lunch Break (1.5h)				
14:30 - 15:45	L. A. Paul Indiscernibility in Metaphysics & in Quantum Mechanics			
Coffee Break (15min)				
16:00 - 16:45	D. Yates [SG] Dispositional essentialism, essence and emergence [k]	F. Longworth [AB] TBA	J. Persson [SB] Three conceptions of explaining how possibly [m]	K. Engelhard [AS] An Identity Theory of Powers [d]
16:45 - 17:30	M. Nagatsu [DY] The Functional Stance in the Sciences of Human Decision Making [o]		R. Stenwall [JP] Against Truthmaker Necessitarianism [o]	M. Haug [KE] Causal Theories of Properties and Contingency Intuitions [d]
Coffee Break (30min)				
18:00 - 19:15	Barry Loewer What Objective Probabilities There Are and What Objective Probabilities Are			
Break (45min)				
20:00 - late	Buffet Dinner (Dinner I) and Viewing of Fischli and Weiss's Lauf der Dinge (The Way Things Go) at Coral			
Rooms	Amber	Coral	Jade	Topaz
	All keynotes and general functions at Coral			

All parallel papers are **30min + 10min** Q&A, please allow **5min** for change of rooms.
Abbreviations: [c] causation [d] dispositions [k] kinds [l] laws [m] modality [o] other [qm] quantum mechanics
Chairs: Please note that everyone except keynotes chairs a session within their column on the same day. Please find your initials behind the name of the person for whom you will be chairing.

Timetable | Sunday, 13 Sept

9:00 - 10:15	A. Eagle Can we Read Metaphysics off Physics?			
Coffee Break (15min)				
10:30 - 11:15	T. Dumsday [EW] Natural Kinds, Laws, and the Problem of Complex Essences [k]	A. Reutlinger [LL] Counterfactuals: A Problem For Interven- tionism [c]	L. Porro [LW] Tropes and Laws of Nature [l]	A. Wilson [TC] Disposition- manifestations and reference frames [d]
11:15 - 12:00	E. Taylor [TD] Real Patterns and Less Real Patterns [o]	A. Marcellesi [AR] Manipulation and In- terlevel Causation [c]	L. Walters [BS] Laws, Explanation and Counterfactuals [l]	L. Kang [AW] Contrastive disposi- tions [d]
Coffee Break (15min)				
12:15 - 13:00	E. Walker [ET] A Defence of Biologi- cal Essentialism [k]	L. Leininger [AM] Non-Causal Mecha- nisms and Effective Strategies [c]	B. Smart [LP] Regularity Theory and Inductive Scepticism; the Fight Against Armstrong [l]	T. R. Cardoso [LK] The fake finkishness: a case of unnotice- able manifestations [d]
Lunch Break (1.5h)				
14:30 - 15:45	Katherine Hawley Natural Properties and Natural Kinds			
Coffee Break (15min)				
16:00 - 16:45	N. Leary [MK] TBA [k]	N. Stein [MT] Immanent and Tran- scent Causation for Aristotelians [c]	T. E. Tahko [HB] Natural Boundaries and Metaphysical Realism [o]	B. Vetter [JW] The explanatory power of dispositional essentialism: a note on A. Bird's Nature's Metaphysics [d]
16:45 - 17:30	M. A. Khalidi [NL] The Trivialization of Essentialism about Kinds [k]		H. Bensusan & M. de Pinedo [TT] A linguistic turn of 360°: taking the complexity of predicates ontologically seriously [o]	J. Wilson [BV] Hume's Dictum and Natural Modality: Counterfactuals [m]
Coffee Break (30min)				
18:00 - 19:15	Marc Lange A Tale of two Vectors			
Break (45min)				
20:00 - late	Conference Dinner (Dinner II) at Strada			
Rooms	Amber	Coral	Jade	Topaz
	All keynotes and general functions at Coral			

All parallel papers are **30min + 10min** Q&A, please allow **5min** for change of rooms.
Abbreviations: [c] causation [d] dispositions [k] kinds [l] laws [m] modality [o] other [qm] quantum mechanics
Chairs: Please note that everyone except keynotes chairs a session within their column on the same day. Please find your initials behind the name of the person for whom you will be chairing.

Timetable | Monday, 14 Sept

9:00 - 10:15	J. McKittrick How to Activate a Power			
Coffee Break (15min)				
10:30 - 11:15	P. Percival [BK] Necessitarianism and indeterminism [o]	J. Roberts [AD] Laws, Measurements, and Counterfactuals [l]	S. Mumford [MK] Powers and Double Prevention [d]	A. Hüttemann [TJ] Towards a dispositional theory of causation [c]
11:15 - 12:00	B. Kiliç [PP] An Ontology for the Frequency Accounts of Probability [o]	A. Drewery [JR] Necessary laws in the non-fundamental sciences [l]	M. Keinänen [SM] Dispositionalism, causal powers and metaphysical necessity [d]	M. ThomsonJones [AH] Holism and Nonsupervening Dispositions in Quantum Mechanics [qm]
Coffee Break (15min)				
12:15 - 13:00	H. Zinkernagel [PG] On the necessity of tomorrow's sunrise [m]	E. Tobin [SD] The Metaphysics of Determinable Kinds [k]	G. Contessa [KC] Shoemaker's Key, Extrinsic Dispositions, and Causal Bases [d]	M. Morganti [TB] Properties, Causality and Identity in Entangled Quantum Systems [qm]
Lunch Break (1h; note the shorter lunch break today)				
14:00 - 14:45	P. Goff [HZ] Supersubstantialist Monism and the Explanation of Induction [o]	S. Dragulinescu [ET] Lowe on Kinds, Changes and Identity [k]	K. Cheng [GC] Dispositions, Rules, and Finks: The privileging problem [d]	T. Bigaj [MM] Quantum entanglement and the metaphysics of dispositions [d]
14:45 - 16:00	J. Woodward Laws, Counterfactuals and Invariance			
16:00 - 16:30	Farewell Coffee			

Rooms	Amber	Coral	Jade	Topaz
	All keynotes and general functions at Coral			

All parallel papers are **30min + 10min** Q&A, please allow **5min** for change of rooms.
Abbreviations: [c] causation [d] dispositions [k] kinds [l] laws [m] modality [o] other [qm] quantum mechanics
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ABSTRACTS

S. Barker

Necessary Connections between Distinct Existences and Physical Modality

[Saturday, 12:15. Chair: R. Stenwall]

The facts of physical modality are facts about physical necessitation, physical possibility, and nomological chances. I distinguish three degrees of involvement that physical modality might have in the world at large. The 1st degree is that modal facts are fixed by the overall patterns of natural property distribution in the actual world. The 2nd degree is that certain 2nd-order relations holding of natural properties determine these facts. The 3rd degree is that the facts of physical modality are inherent in the natural properties themselves. Proponents of the 1st degree are Humeans, those of the 2nd are theorists like Armstrong. Those of the 3rd-degree are powers theorists, who believe that somehow modal power is inherent in natural properties. I argue that the 2nd- and 3rd-degree conceptions are committed to the principle that there are necessary connections between distinct existences, whereas the 1st-degreeers eschew

that principle. I argue that there are good reasons not to accept the principle. Furthermore, its acceptance by 2nd and 3rd degreeers is ultimately self-undefeating. That's because to accept the principle amounts to no more than this: (i) the set of metaphysically possible worlds is a sub-set of the set of possible worlds according to 1st degree theorists; (ii) laws or modal facts supervene on patterns of property distribution throughout these worlds. In other words, the idea that laws or the inherent powers of natural properties govern happenings in the world is given up. But that is a core thesis of both the 2nd- and 3rd-degree views.

H. Beebee

Natural Kind Essentialism

[Saturday, 10:45. Chair: S. Mumford]

Hilan Bensusan & Manuel de Pinedo

A linguistic turn of 360°: taking the complexity of predicates ontologically seriously

[Sunday, 16:45. Chair: T. Tahko]

Properties are supposedly different from mere predicates. Predicates are items of language whereas properties are features of items in the world. It is not straightforward,

no matter what method we use to research in metaphysics, which predicates correlate to properties in the world. Some predicates are arguably just features of our languages – candidates include “enjoyed”, “pleasant”, “good”, “fair”, “vulnerable” or “soluble”, “useful”, “close to me”, “known” and, even, “justified” or “true”. Many of the debates concerning realism in science, in ethics, about taste, about dispositions or about the future hinges on whether the terms of our language have correlates in the furniture of the universe. We claim that, once we take properties to include a) dispositional features of items of the world and b) tropes and less than universal attributes of objects, the road is paved for a metaphysics that admits of more properties than those corresponding to easily definable predicates – often taken to be universal and non-dispositional ones.

T. Bigaj

Quantum entanglement and the metaphysics of dispositions

[Monday, 14:00. Chair: M. Morganti]

I believe that some concepts and distinctions from the metaphysics of dispositions can be fruitfully applied to the analysis of quantum entangled states. I focus on two characteristic features of entanglement: non-locality and non-

separability. Regarding the former, it may be observed that typical instances of non-local interactions involve either creation or destruction of a dispositional property from a distance. I propose to tame this type of non-locality by arguing that quantum dispositions have the following properties: they are not reducible to any categorical (structural) properties, they are mere potentialities with very little actuality, and, most probably, they are not intrinsic properties of their bearers. As for the issue of non-separability, I argue that the relation between dispositions of the entire system and dispositions of its components is that of weak non-supervenience. I also claim that some properties of the entire compound system that are represented by eigenvectors (such as the total spin in the singlet-spin state) should nevertheless be interpreted as deterministic dispositions, not categorical properties.

A. Bird

Tbc

[Saturday, 12:15. Chair: F. Longworth]

T. R. Cardoso

The fake finkishness: a case of unnoticeable manifestations

[Sunday, 12:15. Chair: L. Kang]

Dispositional properties or powers have been one of the central concerns of recent metaphysical discussion. Their importance lies mainly in that they may allow us to account for causal properties as primitive dispositions. Evidently, a complete dispositional ontology requires an understanding of how primitive dispositions relate to other metaphysical issues. Individuality is one such issue: if we are to account for a causal system of events as a system of powers, then we must keep in sight the individuals that bear the relevant properties within the system. I will argue that the three main traditional accounts of identity, the essence, the bundle and the substratum theories, namely, cannot accommodate powers as a primitive category. I will show that the explanation of individuality given by any of these theories might have (within a system of primitive dispositions) the consequence of producing counterintuitive cases of unnoticeable manifestations, cases of what one could call "fake finkishness".

K. Cheng

Dispositions, Rules, and Finks: The privileging problem

[Monday, 14:00. Chair: G. Contessa]

Dispositions have been appealed to in the explanation of a wide range of phenomena which interest philosophers. Much progress can be expected to be made in explaining these puzzling phenomena, if some notion of disposition is shown to be superseded by a superior one. The problem of rule-following is one such example. By replacing a highly inadequate counterfactual analysis of dispositions with a realist view, Martin and Heil (1998) have defended a dispositional account of rule-following against Kripke's (1982) influential criticisms. Things are not so straightforward, however. In a recent paper, Handfield and Bird (2008) argue that the progress made by realist dispositionalists is very limited with respect to solving Kripke's skeptical problem. The aim of this paper is to strengthen the case for realist dispositionalism against some important objections raised by Handfield and Bird. This paper consists of four parts. In part I, I discuss a prominent realist dispositional account of rule-following offered by Martin and Heil (1998), showing how this account improves on previous dispositional accounts criticized by Kripke. In part II, I examine two major objections raised by Handfield and Bird against realist dispositionalism. I shall point out that, while one objection (the problem of intrinsic finks) is ill-founded, another (the privileging problem), once suitably clarified, contains a more substantial challenge for realist dispositionalists to meet. In Part III, I

propose how this challenge may be met. Part IV is a conclusion.

G. Contessa

Shoemaker's Key, Extrinsic Dispositions, and Causal Bases

[Monday, 12:15. Chair: K. Cheng]

Abstract: In this paper, I distinguish two often-conflated theses—the thesis that all dispositions are intrinsic properties of their bearers and the thesis that the causal bases of all dispositions are intrinsic properties of their bearers—and I argue that the falsity of the former thesis does not entail the falsity of the latter. In particular, I argue that extrinsic dispositions are not necessarily counterexamples to the second thesis, because a disposition does not need to include any extrinsic property in its causal basis in order to be extrinsic. The primary purpose of this paper, however, is not to defend the thesis of that causal bases are intrinsic, which for all I say here may well be false, but to suggest that the standard notion of causal basis should be replaced with a more liberal one.

S. Dragulinescu

Lowe on Kinds, Changes and Identity

[Monday, 14:00. Chair: E. Tobin]

An important challenge for any account of natural kinds is the ability to deal with the phase/non-phase distinction and the problem of how kinds are singled out, given the threat of the so-called Spinozan or Heraclitan views on reality. Jonathan Lowe construes natural kinds as substantive universals and differentiates the phase from the non-phase (substantial) changes undergone by kind members by employing certain category-based and natural law-based criteria. These criteria entail that the diachronic conditions of identity for kind members undergoing phase and substantial kind changes have nothing to do with their kind membership. In this paper, I argue that Lowe cannot alleviate the Spinozan and Heraclitan threats on the reality of kinds that his construal of substantive universals seeks to bring into relief. To alleviate them, I suggest, the kind membership should be reckoned with in the diachronic conditions of identity for kind members. In other words, I propose that natural kinds should be understood as ontological categories, in Lowe's idiom.

A. Drewery

Necessary laws in the non-fundamental sciences

[Monday, 11:15. Chair: J. Roberts]

In this paper, I examine how an essentialist metaphysics relates to the

question of whether there are non-fundamental laws, that is, laws in the non-fundamental sciences (such as psychology, biology and so on) . On the face of it, essentialism is a doctrine about the natures of things, and particularly of medium sized physical objects, which are certainly not the things which feature in fundamental laws. One might therefore think that essentialist accounts of laws would lend themselves to a defence of non-fundamental laws. However, some versions of modern essentialism, such as those proposed by Ellis and Bird, seem to adopt a reductionist approach which appears to deny or at least stand in tension with the existence of higher-level laws. I will argue that in creating such a tension, these views undermine the plausibility of their essentialist premises, and that a non-reductive essentialism is a much more attractive option.

T. Dumsday

Natural Kinds, Laws, and the Problem of Complex Essences

[Sunday, 10:30. Chair: E. Walker]

Natural-kind essentialism faces an important but neglected difficulty. The essences of many, if not all, natural kinds seem to be complex, consisting of multiple properties that appear to have no necessary connection between them. Negative charge and a precise rest mass of

9.109×10^{-28} grams are both essential properties of an electron, yet they seem to lack a conceptually necessary connection between them. Hence some particles have the same charge as an electron but a different mass (tau leptons), and the same mass but a positive charge (positrons). How then are these diverse and inherently separable properties unified into a single essence? I refer to this as the problem of complex essences, and attempt here to address it. I also show how the issue has an important bearing on the essentialist ontology of laws.

A. Eagle

Can we read metaphysics off physics?

[Sunday, 9:00. Chair: A. Bird]

I argue that the prospects for a relatively autonomous metaphysics—'autonomous' in the sense that its epistemic status is not solely parasitic on the epistemic status of some scientific theory, as in a 'naturalised' metaphysics—are better than has recently been suggested. In light of this argument, I consider a famous putative instance of a metaphysical theory being refuted by a scientific theory: Putnam's argument from STR against presentism. While no presentist myself, I argue that there are principled metaphysi-

cal considerations that allow presentists to evade this argument. I conclude that the best arguments against presentism are metaphysical in character—physics alone can't show us that a relatively autonomous metaphysical thesis is false.

K. Engelhard

An Identity Theory of Powers

[Saturday: 16:00. Chair: A. Sloman]

Pandispositionalism, the view that all sparse fundamental properties are powers, has been confronted with a number of objections, behind which stands what I call "the dualist intuition" consisting in the conviction that there is an ontological difference between a power and its manifestation that is not merely numerical but a difference in character. Pandispositionalists have rejected these objections, but their rejection is not completely satisfactory. The paper shows, that it is nevertheless possible for pandispositionalism to incorporate the dualist intuition despite holding an all powers view. Theories of this kind are so-called identity theories. They face severe counterarguments. In order to solve these problems a category system is introduced that is able to indicate an ontological difference between a power and its manifestation on the basis of pandispositionalism. This

view I call semi-dualist pandispositionalism.

P. Goff:

Supersubstantialist Monism and the Explanation of Induction

[Monday, 14:00. Chair: H. Zinkernagel]

Non-Humeans Armstrong, Foster and Ellis accuse Humeans of being unable to account for the rationality of inductive inference. I will argue that this consideration has no force against the (four-dimensionalist) monist Humean, for she is able to give an explanation of the rationality of inductive inference relevantly similar to that of Armstrong, Foster and Ellis. These non-Humeans explain induction as involving two kinds of inference: an inference to the best explanation from the past regularity of the world to the existence of necessary connections in nature, followed by a deductive inference from the existence of necessary connections in nature to the future regularity of the world. The (four-dimensionalist) monist Humean can give a similar account: an inference to the best explanation from the past regularity of the world to the fact that spacetime as a whole instantiates the property of having an ordered distribution of properties in its regions, followed by

a deductive inference from the fact that spacetime instantiates such a property to the future regularity of the world.

S. Gozzano

Scientific essentialism and the mind

[Saturday, 12:15. Chair: M. Nagatsu]

M. Haug

Causal Theories of Properties and Contingency Intuitions

[Saturday, 16:45. Chair: K. Engelhard]

In this paper, I sketch a modified version of the causal theory of properties that is designed to accommodate the powerful and prevalent intuition that the relation between causal powers and properties is contingent. This proposal relies on the fact that properties can be reliably sorted into different kinds based on what I call the “aspects” that characterize properties of that kind. If it is only causal powers grounded in aspects of a certain kind that individuate and are essential to a given property, then one can accommodate the relevant contingency intuitions while respecting the naturalistic principles that motivate causal theories of properties.

K. Hawley

Natural Kinds and Natural Properties

[Sunday, 14:30. Chair: H. Beebee]

Given the distinction between natural and unnatural properties, what is the point of natural kinds? Different authors make quite different claims about the ontological status of kinds, disagreeing about whether they are property-like entities, and about whether, if so, there is any significant difference between kind-properties and the rest. Across the literature of metaphysics, philosophy of science, and philosophy of language, on the other hand, natural kinds are expected to perform very varied work, via connections with sortals, individuation and persistence, laws of nature, essence, and the semantics of a certain class of words. Perhaps unsurprisingly, the question about what natural kinds are – and whether they are distinct from natural properties – turns upon what natural kinds are expected to do.

A. Hüttemann

Towards a dispositional theory of causation

[Mon, 10:30. Chair: Thomson-Jones]

L. Kang

Contrastive dispositions

[Sunday, 11:15. Chair: A. Wilson]

Not only the conditional analysis of dispositional ascriptions faces the problems of finks, antidotes, and mimics, but also it is challenged directly or indirectly by (a) the extrinsic dispositions thesis, (b) multi-track dispositions, (c) comparativity of dispositions, and (d) absent stimulus. Besides, the recent study on dispositions suggests that dispositional predicates are context sensitive. In order to rescue the conditional analysis, in this paper, I adopt a contextualist approach towards the semantics of dispositions. More specifically, under the influence of Jonathan Schaffer’s theory of contrastive causation, I propose a contrastivist account of dispositions. I argue the contrastivist account is able to solve all above problems while the traditional conditional analysis is not. What is more, I argue the contrastivist account of dispositions is better than its contextualist cousins. At last, I conclude the contrastivist account of dispositions has the virtues of holding the tradition as well as facing the problems.

M. Keinänen

Dispositionalism, causal powers and metaphysical necessity

[Monday, 11:15. Chair: S. Mumford]

According to one of the basic theses of Ellis's Dispositional Essentialism, the instantiations of fundamental dispositional properties (such as masses or electric charges) necessitate certain fundamental causal processes (such as gravitational attraction or electric repulsion by certain force) in certain circumstances. The distribution of certain kinds of objects and their essential causal powers is contingent, but the connection between property instantiations in certain places and fundamental processes remains metaphysically necessary. Moreover, Ellis's version of Dispositional Essentialism and claim that certain earlier events metaphysically necessitate certain later events avoids the problems presented by Eagle (2009) and Schrenk (2009).

M. Ali Khalidi

The Trivialization of Essentialism about Kinds

[Sunday, 16:45. Chair: N. Leary]

Contemporary essentialism about natural kinds has always been associated with a semantic thesis about the terms that pick out those kinds, namely that natural kind

terms are rigid designators, picking out the same kind in every possible world in which that kind is instantiated. But it is now widely acknowledged that the notion of semantic rigidity cannot be straightforwardly applied to general terms (as opposed to singular terms). According to one proposal, a general term is rigid if and only if there is a unique property which it stands for that determines its extension at each possible world. However, it can be shown that any predicate can be said to stand for the same unique property at every possible world. Thus, as Soames (2000, 251) puts it, "there is no point in defining a notion of rigidity for predicates according to which all predicates turn out, trivially, to be rigid." But the corresponding point concerning scientific essentialism does not seem to have been fully appreciated. If scientific essentialism is the thesis that each scientific kind is associated with the same set of essential properties in every possible world in which it is instantiated, then that thesis can be said to hold for virtually any kind, not just the micro-structural kinds favored by scientific essentialists.

B. Kiliç

An Ontology for the Frequency Accounts of Probability

[Monday, 11:15. Chair: P. Percival]

Is there a property of being $p\%$ F, when F is a property that can be instantiated in an object X, which is also instantiated in X? Frequency accounts of probability usually assume that there is, given by the proportion of X-like objects that have the property F. However, the nature of X-like objects, both in theory and practice, is usually left unanalyzed. I argue that there is an ontological problem here that can be solved by positing natural kinds—substantive or process universals. That is because X-like objects form a complex of universals with various degrees of similarity to X. Assuming that the infimic kind which X instantiates captures the whole repeatable essence of X, and that there is such an essence of X, I propose a possible metaphysical grounding of the frequency theories of probability, and show how this assumption helps solve the reference class problem.

M. Lange

A Tale of Two Vectors

[Sunday, 18:00. Chair: F. Longworth]

Why (according to classical physics) do forces compose according to the parallelogram of forces? This question has been controversial. If the parallelogram law is explained statically, then the laws of statics are

separate from and (in an important sense) transcend the laws of dynamics. Alternatively, if the parallelogram law is explained dynamically, then statical laws become mere corollaries to the dynamical laws. I shall attempt to trace the history of this controversy in order to identify what it would be for one or the other of these rival views to be correct. I shall argue that various familiar accounts of natural law (e.g., Lewis' Best System Account, scientific essentialism) not only make it difficult to see what the point of this dispute could have been, but also foreclose some serious options. I will sketch an alternative that helps us to understand what this dispute was all about.

N. Leary

TBA

[Sunday, 16:45. Chair: M. Ali Khalidi]

L. Leininger

Non-Causal Mechanisms and Effective Strategies

[Sunday, 12:15. Chair: A. Marcellesi]

According to Hartry Field, the problem of reconciling the noted ab-

sence of causation from our fundamental physics with the need for causation in most other areas of science is the central problem in the metaphysics of causation. I argue that Nancy Cartwright's defense of causal realism rests on a problematic ontology of causal laws and capacities. I advocate the abandonment of the notion of capacities and further claim that causal laws are in fact not needed to distinguish between effective and ineffective strategies. The effectiveness of strategies can be explicated in terms of a causally neutral account. This causally neutral account utilizes the concept of mechanisms in which we can appeal to regularities present as part of a stable structure without the invocation of a causal law. I hold that once we have an account of effective strategies without appeal to causation, Bertrand Russell's arguments against causation (and Cartwright's inability to refute them) should compel us to reconsider the position of causal realism.

B. Loewer

What Objective Probabilities There Are and What Objective Probabilities Are

[Saturday, 18:00: N. Leary]

My paper will provide some reasons for thinking that laws of

fundamental physics entail conditional probabilities for all pairs of physically expressible propositions. Then I will argue for the metaphysical view that these probabilities are best understood along the lines of David Lewis' Best Systems account of laws and chances.

F. Longworth

TBA

[Saturday, 16:00. Chair: A. Bird]

A. Marcellesi

Manipulation and Interlevel Causation

[Sunday, 11:15. Chair: A Reutlinger]

Max Kistler and Panu Raatikainen have independently argued that Woodward's manipulationist approach allows for downward causation. If correct, their conclusion is a problem for Carl Craver and William Bechtel who have argued, taking the manipulationist account as their background, that apparent cases of downward causation can be explained away by combining intralevel causal relationships with interlevel constitutive relationships. I disagree with Raatikainen and Kistler. I argue, first, that the causal relata in Raati-

kainen's argument are not located at different levels. Second, I argue that, if we follow Kistler's suggestion, any possible manipulation of a putative downward cause will fail to qualify as an intervention in Woodward's sense. Pace Raatikainen and Kistler, Woodward's approach thus does not allow for downward causation.

J. McKittrick

How to activate a power

[Monday, 9.00. Chair: M. Tugby]

The notion of an activation condition, or "trigger," is central to the notion of a disposition (or power). Dispositions are defined not only by their manifestations, but also their triggers. I will explore the nature of activation conditions and their relation to the powers they activate. In particular, I will consider the implications of pandispositionalism for the nature and role of activation conditions. While many have expressed worries about manifestations involving instantiations of only dispositional properties, it is also worth noting that, on the pandispositionalist scenario, the activation event must be equally dispositional. If all properties are powers, it seems that a triggering event must be an acquisition of a power. But how does something acquiring a power activate

another power to produce its manifestation? I suggest and evaluate possible answers.

M. Morganti

Properties, Causality and Identity in Entangled Quantum Systems

[Monday, 12:15. Chair: T. Bigaj]

Teller's idea that entangled quantum systems exhibit 'inherent' properties, not reducible to the properties of the systems' parts, is endorsed. It is argued, however, that such properties are categorical monadic properties with a 'dispositional aspect' rather than relations. This view is relevant in (at least) two ways. 1) Identity: the view that quantum particles are weakly discernible is challenged. It is shown that such view gets off the ground only if strong metaphysical assumptions are made; and that there are alternative – and at least equally reasonable – ways to preserve particle individuality. 2) EPR-Bell: in the sense in which dispositions may be said to cause their categorical manifestations, inherent properties of entangled quantum systems may be regarded as the common cause of the correlations typical of such systems. The ensuing violation of 'causal separability' is important, but appears preferable to non-locality.

S. Mumford

Powers and Double Prevention

[Monday, 10:30. Chair: M. Keinänen]

M. Nagatsu

The Functional Stance in the Sciences of Human Decision Making

[Saturday, 16:45. Chair: D. Yates]

I will argue that the relation between psychological and economic explanations of individual decision making can be well understood by a metaphysical attitude which I call the functional stance. This stance suggests that scientists study the system in question (e.g. individual decision maker) by identifying it with a specific function (or a set of functions) which it serves, relatively independently from the detailed understanding of underlying implementation mechanisms. In this view, mechanisms are understood less realistically, as a metaphor that enables researchers to interact with the system as if it were an artefact. First, the functional stance better captures an important cognitive heuristic that are routinely exploited in evolutionary biology, cognitive psychology and economics. Second, it explains a recent trend of importing individual-level rational choice theory to illuminate lower-level cognitive and neuro-

physiological mechanisms. Finally, it also explains the limited extent to which neuroscience is informing the economic modeling of individual decision making.

L.A. Paul

Indiscernibility in Metaphysics and Quantum Mechanics

[Saturday, 14:30. Chair: E. Tobin]

I discuss what it is to be an object according to quantum mechanical approaches that make use of the Principle of the Indiscernibility of Identicals. I then show how the quantum mechanical understanding of what it is to be an object should affect theories of objects in metaphysics that make use of the Principle of the Indiscernibility of Identicals, with special attention paid to the bundle theory of objects.

P. Percival

Necessitarianism and indeterminism

[Monday, 10:30. Chair: B. Kiling]

"Necessitarians" ally with Lewis in rejecting Armstrong's view of the modal status of the laws: pace Armstrong, they hold that the laws (if such there are!) supervene on the

microphysical pattern of events. They differ from Lewis (and Armstrong), however, regarding the modal status of this pattern: they reject the view that all combinatorially possible distributions of the microphysical properties are metaphysically possible in favour of the view that (at least in part) the pattern of microphysical events is essential to the properties that compose the pattern. In the main, determinism provides the framework in which arguments for necessitarianism have been articulated. This is not an accident, since these arguments lose much of their force when viewed from the perspective of indeterminism. Consequently, in so far as the term "propensity" has a perfectly good Lewisian usage, it would be doubly misguided for necessitarians to try to appropriate it.

J. Persson

Three conceptions of explaining how possibly

[Saturday, 16:00. Chair: S. Barker]

Three conceptions of how-possibly explanation in science are identified. (1) approaches "how possibly X?" by showing that X is not "epistemically impossible." This is often achieved by a modification of the explanatory belief system. (2) offers a potential how-explanation of X (or a range of such). In recent literature the factual claims implied by the

second variety have been downplayed. (3) has attracted less interest. It presents a partial how-explanation of X. Typically (3) aims to establish the existence of a mechanism by which X can be generated. (3) has more substantial "metaphysical" implications than (1) and (2). With the downplaying of the factual claims of (2), (3) stands out as the only available alternative for the advocate of ontic explanations. Moreover, it seems that (3) is the scientifically most important variety of how-possibly explanation.

L. Porro

Tropes and Laws of Nature

[Sunday, 10:30. Chair: L. Walters]

I will argue that the problems of universals views about laws can be overcome by adopting an ontology of tropes. In arguing for the thesis, I will briefly touch on the problems of universals views. Then I will present two theories of laws in tropes terms and discuss their main problems. I will argue that these problems do not undermine the possibility of an account of laws in terms of tropes, because the problems of the two accounts presented are not due mainly to tropes. Finally, I conclude by describing a third possible account of laws in terms of tropes, and by arguing that this is better than the two accounts presented.

A. Reutlinger

Counterfactuals: A Problem For Interventionism

[Sunday, 10.30. Chair: L. Leininger]

In my talk I address a problem for interventionist theories of causation: Interventionists claim to advocate a counterfactual theory of causation, but they fail to provide truth conditions for counterfactual conditionals. In order to solve this problem, one has to provide a semantics for counterfactuals. Contrary to interventionists I defend the claim: Not only interventions but also laws are essential for evaluating counterfactuals. The most common brands of semantics – Lewisian and Goodmanian semantics – support this thesis. Since Lewisian semantics has become the orthodoxy in the debate, it would be the easiest way to adopt this standard account of semantics. But interventionists have convincing arguments against Lewisian semantics. Granting that these arguments are sound, I will consider an alternative account of truth conditions for counterfactuals: a modified Goodmanian semantics. In the upshot, interventionism is a counterfactual theory of causation that relies on (an attractively) different semantics than the orthodox Lewisian counterfactual theory of causation.

J. Roberts

Laws, Measurements, and Counterfactuals

[Monday, 10:30. Chair: A. Drewery]

It is very plausible (I shall argue) that P is nomologically necessary iff P is a consequence of the set of truths which guarantee the reliability of those procedures which count as legitimate measurement methods. The most obvious explanation of this biconditional is that what it is to be a legitimate measurement is to be an empirical finding-out procedure that is nomologically reliable. I want to try out the idea of turning this explanation around: What it is to be a law of nature is to be a proposition (or fact) that states the reliability of some legitimate measurement method. This yields an analysis of lawhood that has some interesting virtues: In addition to capturing the extension of lawhood, it offers an elegant explanation of why laws are related to counterfactuals in the way they are, and it suggests an illuminating explanation of what makes the law-supported counterfactuals true.

A. Sloman

Virtual Machines and the Metaphysics of Science

[Saturday, 12:15. Chair: M. Haug]

Philosophers regularly use complex virtual machines (not virtual realities) composed of enduring interacting non-physical subsystems (e.g. operating systems, word-processors, email systems, web browsers, and many more). Yet, almost all ignore (or misdescribe) these VMs when discussing functionalism, supervenience, multiple realisation, reductionism, emergence, and causation. Such VMs depend on many hardware and software designs that interact in very complex ways to maintain a network of causal relationships between physical and virtual entities and processes. I'll try to explain this, and show how VMs are important for philosophy, in part because evolution long ago developed far more sophisticated systems of virtual machinery (e.g. running on brains and their surroundings) than human engineers so far. Most are still not understood. This partly accounts for the apparent intractability of several philosophical problems. E.g. running VM subsystems can be disconnected from input-output interactions for extended periods, and self-monitoring can be unreliable. For details see: <http://www.cs.bham.ac.uk/research/projects/cogaff/09.html#vms>

B. Smart

Regularity Theory and Inductive Scepticism; the Fight Against Armstrong

[Sunday:, 12:15. Chair: L. Porro]

In this paper I argue against Armstrong's claim that the regularity theorist must be an inductive sceptic. Armstrong argues that, by using the principle of inference to the best explanation, he can infer a natural necessitation relation that entails the continued uniformity of nature, whereas the pattern of inference leading to the regularity theorist's laws allows for no rational conclusions about future instances whatsoever. Contra Armstrong, I argue that the laws posited by the regularity theorist can serve as perfectly good explanations for why phenomena have been observed to have the properties they do, and that if they can be inferred, they can justifiably be used to make inductive inferences about future states of affairs. Although the arguments I provide do not give the regularity theorist strong justification for universal regularities, I propose a 'regularity relation' (which can contingently hold between universals), which posits no ontological commitments over and above observed instances, but where it holds, a high probability of our inductive inferences being correct is entailed. I show under what circumstances this relation should

be inferred, and why it should be seen as a better explanation of why the phenomena have been observed to have the properties they do than Armstrong's more mysterious natural necessitation relation.

N. Stein

Immanent and Transeunt Causation for Aristotelians

[Sunday, 16:00. Chair: M. Tugby]

There are causal connections between distinct entities which bring about changes in each other, but also, it seems, between earlier and later states or stages of the same entity. These phenomena fall on the two sides of a distinction, recently revived by some philosophers, between so-called immanent and so-called transeunt causation. The nature of the distinction between immanent and transeunt causation, however, and the relationship between them, is obscure: for all we know, immanent causation may be no kind of causation at all, or a reasonably interesting but distinct part of it, or encompass all the kinds of causal relation we think of as typical. In order to elucidate the matter, I examine how they relate to one another in a well-developed Aristotelian-realist account of causation, causal powers, and properties.

R. Stenwall

Against Truthmaker Necessitarianism

[Saturday, 16:45. Chair: J. Persson]

As the title suggests, this paper is an argument against Truthmaker Necessitarianism – the doctrine that the existence of a truthmaker necessitates the truth of the proposition it makes true. Armstrong's sufficiency argument for necessitarianism is examined in detail and shown to be question-begging. It is then argued that necessitarianism has no explanatory role to play in Armstrong's argument for states of affairs, and that the necessity that states of affairs confer on truth can be explained away by their identity-criterion. In the closing section I address two methodological worries: (i) that a contingent form of truthmaking allows for too many truthmakers that we intuitively would not recognize as such; and (ii) that the explanatory role played by truthmakers requires that a truthmaker necessitates what it makes true. Both of these worries are shown not to stand up to scrutiny.

E. Taylor

Real Patterns and Less Real Patterns: A Challenge to Information-Based Accounts of Ontological Commitment

[Sunday, 11:15. Chair: T. Dumsday]

In this paper I formulate an objection to a family of information-based views on ontological commitment, a group that includes Dennett's views on patterns, Bedau's account of weak emergence and Ladyman and Ross' account of ontological commitment. These authors claim that what we can do with some set of data – compress it, derive some other set of data from it without simulation – indicates the presence of an objective ontological entity. I'll present an objection which suggests that the criteria for these features – patterns for Dennett and Ladyman & Ross, weak emergents for Bedau – are subject to a sceptical problem which indicates that the features themselves do not indicate objective ontological entities.

T. E. Tahko

Natural Boundaries and Metaphysical Realism

[Sunday, 16:00, Chair: H. Bensusan]

Traditionally, realism attempts to uphold the natural boundaries that

we observe in everyday life such as apples, cats and mountains, but a closer look will reveal that there is some vagueness concerning the boundaries of all these things, even natural kinds seem to be subject to vagueness. The question that arises is whether there are any natural boundaries at all, does the notion of a natural kind have any bearing on reality? If there are no such natural, bona fide boundaries, then extreme conventionalism threatens. However, I will answer this question in the affirmative and argue that, at the very least, fundamental particles are bona fide as opposed to artificial, fiat entities and that extreme conventionalism concerning natural kinds can be undermined. This is because macroscopic objects would not be possible without bona fide entities, as I will proceed to argue in the paper.

M. Thomson-Jones

Holism and Nonsupervening Dispositions in Quantum Mechanics

[Monday, 11:15. Chair: A. Hüttemann]

Many have been moved to say that that there is something striking about part-whole relations in quantum mechanics, and (further?) that quantum-mechanical systems can display a novel sort of "holism." The

most appealing and influential attempt to say more, due to Paul Teller and Richard Healey, proposes that the holism we find in QM is a matter of nonsupervenience – on Healey's variant, the nomological nonsupervenience of one or more intrinsic properties of the whole on the intrinsic properties of the parts and the spatial relations amongst them. By connecting this issue to questions about dispositions in QM, however, I argue that the Teller-Healey proposal fails. Nonetheless, a new argument for the existence of a kind of holism in QM emerges from the critique, and I thus outline an alternative account of what such holism might be. In addition, I extract an argument for the existence of bare dispositions in QM.

E. Tobin

The Metaphysics of Determinable Kinds

[Mon, 12:15. Chair: S. Dragulinescu]

Armstrong (1997: 65-68) argues that natural kinds supervene upon more simple monadic and relational universals. Moreover, since kinds supervene, then they are not an ontological addition to their base. However, I argue that there is an important distinction to be made between two kinds of natural kind: determinate kinds and determinable kinds. Pace Armstrong, this paper argues that determinable kinds re-

quire a distinct category. Firstly, I argue that higher-level laws involving determinable kinds cannot be reduced to their determinate instances, because the set that includes all the instances is itself a complex determinable. Secondly, I argue that the existence of overlapping determinable kinds which group disparate determinates together in virtue of a shared functional role is commonplace in scientific classification. This provides sufficient evidence for the explanatory power of the determinable kind category. The second part of the paper examines what is required for a metaphysical account of determinable kinds.

B. Vetter

The explanatory power of dispositional essentialism: a note on A. Bird's Nature's Metaphysics

[Sunday, 16:00. Chair: J. Wilson]

I look at the case made for Dispositional Essentialism in Alexander Bird's recent book "Nature's Metaphysics". I start by reconstructing the argument and show that it crucially relies on the superior explanatory power of Dispositional Essentialism, encapsulated in Bird's derivation of laws of nature from the characterization of fundamental dispositional properties. The derivation, however, fails to take account of an all-important feature of both

the properties and the laws: they involve quantities, rather than qualities. Trying to do justice to this fact, I consider possible reformulations and find that they have to either give up the main tenet that motivates Dispositional Essentialism, or incorporate a very different conception of dispositions from that put forward by Bird and other dispositional essentialists. Either way, the superior explanatory power of Dispositional Essentialism has yet to be demonstrated.

E. Walker

A Defence of Biological Essentialism

[Sunday, 12:15. Chair: E. Taylor]

This paper challenges the doctrine that biological essentialism is incompatible with Darwinian evolutionary theory. I defend a minimal essentialism whereby the intrinsic structures of natural kinds serve not only to individuate them uniquely, but also to explain the characteristic properties by which we recognise and classify them. I suggest that the criterion of identity of a biological species is constituted partly by its genomic structure, and partly by its ancestral lineage, though these have different explanatory roles. I argue that an organism belongs to its kind necessarily and instantiates the criterion of identity appropriate to its kind. I tackle briefly the profu-

sion of conflicting anti-essentialist species concepts. I explore the relation between the necessity of origin and phylogenetic species concepts, I argue that Mayr confuses operational criteria for species delineation with theoretical definitions of what species are, and explain why LaPorte is wrong to claim that an organism does not necessarily belong to its species.

L. Walters

Laws, Explanation and Counterfactuals

[Sunday, 11:15. Chair: B. Smart]

Boris Kment (Mind 2006) argues that if deterministic laws are exceptionless, then the past is not counterfactually fixed. But the fixity of the past is, at least in some contexts, a datum. So Kment concludes that laws can have exceptions. Kment's argument, however, is only plausible on a governing conception of laws that many reject. Moreover, accepting that laws can have exceptions leads to the absurd result that there are worlds where it is a law that all Fs are Gs, there are thousands of Fs, but that none of them are Gs. This does not, however, condemn the governing conception of laws, since Kment's conclusion is not a consequence of such a conception. Rather, it relies on further non-Humean claims that the governing

conception of laws does not entail. The real lesson from Kment's argument is that we must reject some elements of the traditional non-Humean picture of laws.

A. Wilson

Disposition-manifestations and reference frames

[Sunday, 10.30. Chair: T. Cardoso]

Various authors, in particular Cartwright [1983] have expressed scepticism about the reality of component forces, component accelerations, and component velocities. If such component vectors really are 'imaginary' or 'mere calculational devices' then this has worrying consequences for the metaphysics and epistemology of dispositions, in particular for the distinction between manifestations and effects recently defended by Molnar [2003] and Mumford [2009]. In this talk, I defend the metaphysical and epistemological propriety of (at least some) component vectors by giving a positive account which can underwrite their reality and their knowability. The account appeals to the physical concept of a frame of reference; being a component vector and being a resultant vector are shown to be frame-dependent quantities. This allows us to retain a viable distinction between manifestations and effects.

J. Wilson

Hume's Dictum and Natural Modality: Counterfactuals

[Sunday, 16:45. Chair: B. Vetter]

Schaffer (2004) suggests that the best account of counterfactuals (CFs) requires the truth of HD (causal)—HD as applied to the case of causal or lawful connections. I overview the content of and motivations for the account of CFs Schaffer has in mind (effectively, along lines of Lewis (1973) and (1979)), and identify three sub-claims upon which Schaffer's argument depends: (1) the best account of CFs is a similarity-based account; (2) there are non-artificial contexts in which the similarity-based evaluation of an appropriate range of CFs involves appeal to a "COSMic" account (a "Miraclebased" account of Comparative Overall Similarity; and (3) a similarity-based account of CFs, filled in with a COSMic account, requires the truth of HD (causal). I argue that while (1) is plausible, (2) is false; and that in any case (3) doesn't follow from (1) and (2).

J. Woodward

Laws, Counterfactuals and Invariance

[Monday, 14:45. Chair: M Schrenk]

A key feature of theorizing in physics is the deployment of a distinction between (1) laws and (2) initial conditions. This talk will not propose a "reductive" account of this distinction in terms of some other set of concepts, but will defend a connecting principle linking (1) and (2): roughly speaking, laws describe relationships that continue to hold (are "invariant") under a certain class of changes in initial conditions. Laws are thus not stable under all counterfactual suppositions but only a special subset of these. After exploring some of the implications of this idea for our understanding of the explanatory role of laws, I will then discuss its relationship to some other treatments of laws in the philosophical literature, including "governing" conceptions of laws, the Mill-Ramsey-Lewis account, and Marc Lange's treatment of laws in terms of counterfactual stability.

D. Yates

Dispositional essentialism, essence and emergence

[Saturday, 16: 00. Chair: S. Gozzano]

I argue that if essence is analysed modally – E: 'P is essential to x iff necessarily, for all y, if y=x then P(y)' – then dispositional essentialists

cannot make sense of emergence. Given dispositional essentialism, emergent properties supervene with metaphysical necessity. But then given E, any putatively novel powers emergent properties contribute will be essential to their base properties, hence not genuinely novel. Given E, either emergence is impossible or dispositional essentialism is false. I argue that dispositional essentialists ought to reject E, and show that Kit Fine's primitivist theory of essence, which rejects the right-to-left part of E, enables dispositional essentialists to make sense of emergence. I discuss the cost of Fine's primitivism, and suggest that defenders of the modal analysis who wish to rule out Fine's own counterexamples to E are no better off, as they must rely on a prior understanding of essence not captured by E.

Hume's sceptical conclusion is untenable. The argument attempts to establish that Hume (or modern day Humeans) must presuppose the future validity of causal laws (in particular, the 'causality content' of Newton's laws) in order to speak meaningfully, or in a well-defined manner, about 'tomorrow' and 'future'. If this is true, it becomes impossible (or ill-defined) to assert that the causal laws might be invalid in the future. This implies that although the sun may fail to rise again tomorrow due to some physical cause it cannot fail to rise as a consequence of a failure of the causal laws.

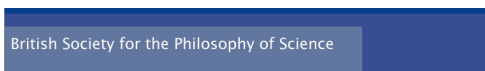
H. Zinkernagel

On the necessity of tomorrow's sunrise

[Monday, 12:15. Chair: P. Goff]

Hume notoriously argued that tomorrow's sunrise – and, in general, the future validity of causal laws – is a purely contingent matter. The sun may or may not rise again tomorrow, and we have at most (insufficient) inductive grounds for believing that tomorrow will resemble today in this respect. In this paper I sketch an argument to the effect that

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