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ABSTRACTS

Myrdene Anderson (and Donna West)
Revisiting Peirce's Notion of "Habit"

Charles Sanders Peirce, and other pragmatists drawing on Aristotle, devoted much attention to refining the notion of "habit", venturing beyond philosophy to psychology, biology, and cosmology. Peirce outlined, beyond habit, the habit of habit-taking along with the habit of habit-change, quintessentially the "would-be" of the logical interpretant. We suggest that an analysis of "habit" might also resuscitate the anthropological notion of "culture", as the denotations and connotations of that term have waxed and waned beyond that discipline, initially documented by Kroeber and Kluckhohn (1952) and later last century in Raymond Williams' *Keywords*.

Sten Anttila, Johannes Persson, Niklas Vareman, Nils-Eric Sahlin
Quality of Evidence According to GRADE: Interpretations in Conflict

GRADE (Grading of Recommendations Assessment, Development, and Evaluation) is a framework for rating quality of evidence and strength of recommendations in medicine. The ultimate aim of GRADE is to provide standardized clinical practice guidelines that address alternative management options. Many important organizations in healthcare from all over the world participate in the GRADE network, including WHO, Cochrane, AHRQ, and NICE.

In an effort to ensure that GRADE is not compromised a number of guideline articles (2) have been published by the GRADE working group in the *Journal of Clinical Epidemiology* (JCE). One of these articles addresses the question when to rate down evidence due to imprecision. The use of the confidence interval as a measure of precision is discussed.

The purpose of this article is to show, for the first time, that there are two alternative, competing interpretations of quality of evidence in regard to precision in the GRADE guideline article. We call these two interpretations of quality of evidence the *narrowness* interpretation and the *conclusiveness* interpretation, respectively. The narrowness interpretation uses the confidence interval (CI) as a direct measure of quality; the wider the CI the lower the quality. The conclusiveness interpretation sets the CI in relation to limits of appreciable harm or appreciable benefit. Here quality is low only if the CI covers one of these limits, regardless of whether the evidence on a narrowness interpretation is good or not. Conflict arises where these interpretations lead to different ratings of the same evidence.

This article is a product of work made within the multi-disciplinary research program VBE – Science and Proven Experience that aims to contribute to the understanding of, and interaction between, these concepts. Analyzing how evidence is understood in the prestigious GRADE framework is one part of this work.

Milos Arsenijevic

Truth and the Open Future: The Solution to Aristotle's Sea-Battle Challenge with the Principle of Bivalence Retained

The talk deals with Aristotle's famous sea-battle problem concerning the truth values of sentences about contingent future events: If an utterance of the sentence "There will be a sea battle tomorrow" is true, then it seems that it is determined that there will be a sea battle tomorrow. For otherwise, how could the utterance be true? If, however, an utterance of the sentence "There will be a sea battle tomorrow" is false, then it seems that it is determined that there will be no sea battle tomorrow. For otherwise, how could the utterance be false? Thus, it seems that it is determined whether there will be a sea battle tomorrow or not – and so for any future event whatsoever. This, however, is in conflict with the (plausible) assumption that there is such a thing as an open future, i.e., that at least for some (possible) future events, it is not determined whether they will take place or not.

Some have argued, in light of this problem, that sentences about future events are neither true nor false. In this talk, however, it shall be argued that the sea-battle problem can be resolved in an intuitively plausible manner without giving up the principle of bivalence.

Aristides Baltas

Practicing Governance: Background Reflections with Tools from HPS and Philosophy

It could be called my experience that at the very time that the mind focuses on issues requiring rapid decisions with inadequate knowledge of all the parameters involved, a portion of the mind is in the process of reflecting from the background on those parameters and those decisions. The reflections in question emerge after a considerable lapse of time by themselves, so to speak, taking me almost unawares. These organize and give shape to the same parameters and decisions while belonging to frameworks of thought which have occupied me for many years. They come HPS and philosophy: rationality, realism, idealism, incommensurability, the ethical and the democratic, the institutional and

the everyday, the real and the nominal aspects of power and so forth. The paper aims at a crude survey of this experience and those issues.

Pierluigi Barrotta

On the Relationships Between Science and Democratic Societies. A Pragmatist Perspective

In the talk I shall briefly introduce four traditional views on the relationships between science and democratic societies. I shall define, a) *Moderate enthusiasts* (pure science is not responsible for the use of knowledge made by society); b) *Radical enthusiasts* (both science and technology are objective and morally neutral); c) *The radical apocalyptic party* (scientific knowledge is a social construction); d) *The moderate apocalyptic party* (scientific research must somehow be controlled or balanced by moral values).

These are apparently incompatible views on the relationships between science and democratic societies. Nonetheless, I shall show that they all share three basic presumptions: 1) Science and society face each other as two separate and internally homogeneous blocs; 2) Information flow is unidirectional: it only goes from science to society (or the other way round, from society to science); 3) If science were not morally neutral then it would not be objective.

Through the use of Pragmatist philosophy (above all, Peirce and Dewey) I shall argue they should be replaced by the following three claims: 1) science and society are both heterogeneous and fragmented, showing variable and shifting alliances between components of science and society, 2) information flow is bi-directional through “transformative” processes, 3) science is both value laden and objective. Finally, I shall connect these three claims with the peculiar concept of truth upheld by pragmatists (especially Peirce), and I shall defend the notion of a “social inquiry”, where science, morality and politics are different aspects of the very same research, which aims at the truth.

Ori Belkind

On Newtonian Induction

This paper examines the distinct nature of Newtonian inductivism and its connection to methodological atomism. According to my interpretation, Newton's Rule III for the Study of Natural Philosophy is a criterion for isolating the primary qualities of the atomic parts. The invariance indicated by Newton's Rule III (i.e., that a quality cannot be intended or remitted) is invariance under changes of texture (or the configuration of the body's parts), which implies that the qualities arise from the qualities present in the ultimate parts of matter. The universal nature of such qualities also raises the laws describing these qualities to the status of laws of nature.

Jonathan Berg

What are the Data of Philosophical Thought Experiments?

ABSTRACT: I argue that the data collected by philosophical thought experiments--the “intuitions” we appeal to regarding hypothetical situations constructed to test philosophical hypotheses--should be construed as metalinguistic, about what we are inclined to say. For one thing, although concepts cannot be directly perceived, they are reflected in our use of the words associated with them; moreover, our beliefs about what we would say in a given situation are typically less vulnerable to objection than our object-level beliefs about the situation itself. I submit that these metaphilosophical considerations might ultimately provide evidence against semantic contextualism.

Leonardo Bich

Emergence and Complexity: An Epistemological Account

This talk will address the relationship between emergence, organization and complexity in physical and biological systems. Particular attention will be paid to the role of the observer, especially: (a) the different operations performed to identify the pertinent elements at each descriptive level, and (b) the relationships between the models built from them. An epistemological notion of emergence will be introduced, defined as the insufficiency in principle of a single descriptive modality to provide a complete description of certain classes of systems, for which bottom-up (structural) and top-down (functional) descriptions are not just one the inverse of the other. From this perspective, a distinction between emergence and self-organization will be proposed, together with a reinterpretation of downward causation as a problem of relation between descriptive domains instead of an influence of a whole on its parts.

Andreas Blank

Sixteenth-Century Pharmacology and the Question of Emergence

Sixteenth-century pharmacology was still very much under the influence of the distinction between effects of medicaments that were taken to be explainable by the elementary qualities and effects that were ascribed to a medicament's capacity of “altering by its whole substance”. That many early moderns explained the latter capacities through celestial causation is well known. However, it may come as a surprise that, as I will argue, one also finds emergentist lines of thought that regarded the substantial forms of such medicaments as being endowed with genuinely new causal powers while being at the same time dependent upon the mixture of elements.

Michael Bradie

Models and Metaphors in Cultural Evolution

The past 30 years has seen a burgeoning literature developing and applying Darwinian and other evolutionary models to the description and explanation of cultural change. Several models and metaphors drawn from evolutionary biology have proved to be particularly fruitful in modeling certain aspects of cultural change including ‘populations,’ ‘selection,’ and ‘fitness.’ In addition, the concept of ecological niche has been generalized to include so-called ‘cognitive niches’ that have been deployed

to help model the evolution of language, a key determinant in the emergence and evolution of culture. After some preliminary remarks on these moves I want to explore the feasibility and utility of a further extension to what might be labeled 'sociocultural niches,' which I suggest are important for understanding the 'evolution' of cultural practices and institutions.

Bryson Brown

Reasoning in a Pluralistic World View

Pluralism helps us to focus on science as it is, rather than as we think it might eventually or ideally be. But pluralism raises worries about how we understand scientific reasoning: when incompatible principles are applied at different points in an account of some phenomena, we can't capture the contents of the account by appeal to the closure of those principles under a classical consequence relation or the set of models of those principles. While we can avoid some of these difficulties by keeping our reasoning 'local', real applications often combine models governed by different principles to deal with complex phenomena at different scales. I apply *chunk and permeate* (C&P, cf. Brown and Priest, 2004) to model reasoning in *nested models* in climate science and argue for a modified approach to the permeation relations employed in C&P.

Karim Bschrir

Predictions in Science and Predictions in the Philosophy of Science: A Discrepancy

I claim that our philosophical theories of scientific prediction are myopic. Philosophers tend to focus predominantly on the epistemic role of predictions in debates about realism and theory testing, and often forget about the relevance of temporal predictions. In my talk, I will do three things: First, I will argue that temporal predictions are not merely time-indexed implications of theories that serve as potential confirmational instances for the latter, as many philosophical accounts still have it. Second, I show that temporal predictions play an independent and equally important epistemic role, which cannot be construed as a special case of conformational prediction. Third, I give examples from current science for temporal predictions that have little or no confirmational import.

Giovanni Camardi

Information as a Property

Claude Shannon's theory of information has lost part of its credibility, due to the contrast between its claim about the irrelevance of the meaning for managing information issues and the "strongly semantic conception of information". I line up with Shannon in order to claim information is not the meaning, the object or the semantic content but, rather, *a property* of a message, the property of reducing uncertainty *primarily by means of an optimal encoding*. I argue that the design of an efficient encoding system, with no semantic commitment, is crucial for understanding both the ontological character of information as a property, and the philosophical payoff of information theory. To this aim, I will explore the mathematics of the Twenties and Thirties (basically Hilbert and Church) for understanding Shannon strategy.

Anjan Chakravartty

Realist Representations of Particles: Causal vs. Formal

This paper explores different, realist conceptions of what is described in the Standard Model of particle physics. The theory describes properties of particles (like mass, charge, and spin) as invariants of certain symmetry groups, and some think that this suggests a structuralist ontology. I describe this thinking as “top-down”; it proceeds from a set of mathematical relations to the natures of properties. Others think that symmetries describe an ontology of causal properties (e.g. dispositions). I describe this thinking as “bottom-up”; it proceeds from the natures of properties in the world to a mathematical description of them. I consider the contrasting motivations for these opposed conceptions of realism, and the question of whether one is preferable.

Erik Curiel

Kinematics, Dynamics and the Structure of Physical Theory

Every physical theory has (at least) two different forms of mathematical equations to represent its target systems: the dynamical (equations of motion) and the kinematical (kinematical constraints). Kinematical constraints are differentiated from equations of motion by the fact that its particular form is fixed once and for all, irrespective of the interactions the system enters into. By contrast, the particular form of a system's equations of motion depends essentially on the particular interaction the system enters into. I argue that it is exactly satisfaction of the kinematical constraints that renders meaning to those terms representing a system's physical quantities in the first place, even before one can ask about whether or not the system satisfies the theory's equations of motion. It is, moreover, those constraints that differentiate types of physical systems, and not their dynamics. Kinematical constraints, therefore, are in a precise sense constitutive of the kinds of system a given theory can treat. I further argue that satisfaction of the kinematical constraints is required as a precondition for the appropriate application of a theory in modeling a kind of system, and so the kinematical constraints in fact function in that precise sense as a priori constitutive components of a physical theory.

Philip Ehrlich

Are Points (Necessarily) Unextended?

Ever since Euclid defined a point as “*that which has no part*” it has been widely assumed that points are necessarily unextended. It has also been assumed that, analytically speaking, this is equivalent to saying that points or, more properly speaking, *degenerate segments*—i.e. segments containing a single point—have length zero. In our talk we will challenge these assumptions. To make our case, we will provide models of ordinary Euclidean geometry where the points are extended despite the fact that the corresponding degenerate segments have null lengths, as is required by the geometric axioms. We will also touch on some of the mathematico-philosophical implications of the existence of such models.

Mehmet Elgin

Multiple Realizability, A Priori Laws and the Autonomy of Special Sciences

Putnam (1967) and Fodor (1974) argued that higher-level properties that figure in higher-level generalizations are multiply realized. They argued that since there is a one to many relationships between higher-level properties in higher-level generalizations and their physical realizers, higher-level generalizations couldn't be reduced to lower level laws. They used this argument to show that special sciences are autonomous. Millikan (1999) and Shapiro (2000) noticed something really important in Putnam and Fodor's argument. They both argued that if higher level properties are multiply realized in Putnam and Fodor's sense, the only laws one can have in the special sciences will be a priori laws. The reason is that if there are no lower-level empirical laws corresponding to the empirical generalizations at the higher-levels, then the higher level empirical generalizations would have to hold not as a matter of law but as a matter of pure chance. Rosenberg (1994) argues that since biological properties are multiply realized, there are no laws in biology except the principle of natural selection.

However, if natural selection generalizes over fitness differences and fitness is a multiply realized property, then the principle of natural selection has to be an a priori law, not an empirical law. Weber (1996) argues that it is possible to identify common physical properties in a given species that determine the fitness differences. Kim (1992) argues that local reductions are possible. Kim's views and Weber's views have important similarities. In my talk, I will argue that fitness is a multiply realized property and that the principle of natural selection generalizes over fitness differences is an a priori law. Both Kim and Weber may be right about local reductions; however, when we want to formulate generalizations across all species about fitness, the generalizations we formulate turn out to be a priori statements. The fact that the principle of natural selection turns out to be a priori does not undermine its theoretical function in evolutionary biology. Millikan and Shapiro were skeptical about a priori laws but the example of fitness shows that there is no need to be skeptical about them. We can get the complete autonomy for special sciences Putnam and Fodor desired from the multiple realizability thesis. However, the way we get this autonomy is not something either Putnam or Fodor would approve since they are not friendly toward a priori laws.

Marc Ereshefsky

Natural Kinds, Mind-Independence, and Defeasibility

Abstract: Philosophers typically require that natural kinds exist independent of human thought. However, many classifications of kinds that help us understand and manipulate the world refer to kinds that depend on us. Instead of requiring that natural kinds be mind-independent, we should borrow an idea from epistemology and require that natural kind classifications be defeasible. Requiring that natural kind classifications be defeasible helps us spell out the ways natural kind classifications should and should not depend on us. Such an account of natural kinds charts a safe passage between conventionalism and naïve naturalism.

Melinda B. Fagan

Explanation and collaboration

In many scientific fields, explanatory models are constructed by integrating results from diverse research groups, frequently across traditional disciplinary boundaries (e.g., Craver 2007). Successful integration requires compatibility in the aims and standards of participating researchers or research groups. I use two cases from recent systems biology to illustrate contrasts between successful and unsuccessful explanatory collaborations. I then note parallels between successful collaborative practices and the explanatory models thereby produced. Explanations of this kind, I argue, have distinctive virtues, which can be explicated in terms of collaborative concepts. This collaborative approach can be further extended to relations among different philosophical accounts of explanation.

Carrie Figdor

The Fallacy of the Homuncular Fallacy

Homuncular functionalism is a leading philosophical framework for naturalistic psychological explanation. It shares commitment to a decompositional style of explanation with recent articulations of mechanistic explanation. A distinguishing feature of the former is its restrictions on permissible explanantia in psychology: parts cannot perform the same functions as the wholes of which they are part. This restriction is driven by the claim that an explanation of intelligence that posits intelligent components is no explanation at all. I argue that the homuncular fallacy is not a fallacy, that there is no epistemic justification for the restrictions, and that the problem of “discharging” homunculi is an artifact of taking the homunculus metaphor too seriously.

Malcolm Forster

Causation: Can the Philosophical and Scientific Conceptions Be Unified?

The Causal Markov Condition is the key axiom of the structural theory of causation; it defines the notion of cause as it is used within the sciences. The Causal Markov Condition entails independencies from the absence of causal arrows in the model. The present paper attempts to extend the structural theory to cover actual causation in a novel way. The idea is to strengthen causal models to include event causal claims, and to strengthen the Causal Markov Condition so that the strengthened causal models entail partial independencies.

Dimitri Ginev

Hermeneutic Realism and Hermeneutic Philosophy of Science

This talk discusses the connection between a hermeneutic philosophy of science and a holist realism that discards foundational epistemology and cognitive essentialism. In considering practices of

scientific inquiry to be “readable technologies”, the talk proposes a realist position that addresses the reality of scientific domains in terms of reading that constitutes “texts” of a special kind. At stake in this treatment of domain’s reality is the interplay of interrelated scientific practices and the possibilities for doing research which they at once project and actualize. Three kinds of hermeneutic circularity in this interplay are distinguished. They refer accordingly to the selection of data, the construction of data-models, and the saving of phenomena whereby theoretical objects become contextually envisioned. The main emphasis is placed on the reading of theoretical objects in the constitution of “texts”.

Marco Giovanelli

Physics is a Kind of Metaphysics: Meyerson's Influence on Einstein's Late Metaphysical Realism

The question whether Einstein was a realist has been widely discussed in literature. Einstein often deemed realism as meaningless, but used realism against quantum mechanics. This paper suggests that Einstein's correspondence with Émile Meyerson (1926-1927) might be a neglected source to solve this riddle. In Meyerson's work Einstein found the possibility to combine the belief in the independent existence external world with the conviction that the latter can be grasped only by speculative means. Einstein could present his search for unified field theory as a metaphysical-realistic program opposed to the positivistic-operationalist spirit of quantum mechanics.

Wenceslao J. Gonzalez

Pragmatic Realism and Prediction in the Social Sciences: The Role of Complexity.

According to the general emphasis of pragmatic realism in science as human activity and the role of objectivity, prediction in the social sciences (e.g., in economics) cannot be seen as if it were a mere intellectual exercise of knowledge but rather it should be oriented towards relevant issues. a) These could be either regarding the validity of the theories available (which is very important in the case of economics), b) the reliability of the practical solutions to specific problems, or c) the large amount of variability in the application of the tested scientific solutions.

Within this context of pragmatic realism, the evaluation of the axis of the proposal — scientific realism around activity and objectivity — comes from how scientific prediction deals with complexity, both structural and dynamic. This is crucial in the case of prediction of the social sciences, where complexity is in the social world (particularly, in economics) at different levels (micro and macro, organizations and markets, individuals and groups, etc.). The test of the dealings of prediction in these sciences with complexity should reinforce the need for objectivity while developing the scientific activity in the three spheres indicated: basic science, applied science, and application of science.

Sara GreenOn the Role of Physics in Biology

Philosophers of biology have forcefully argued that explanations in biology are irreducible to and independent from physical explanations. In many contexts, however, biologists appeal to physical science approaches. This talk reexamines the relation between biology and physics in the context of multi-scale modeling in developmental biology and systems biology. My aim is to specify what physical science approaches can provide to the study of living systems, and to explore fruitful interactions between the literatures in philosophy of physics and philosophy of biology. Whereas physical forces and constraints are often considered to be non-explanatory background conditions for biological explanations, I argue that a more integrated perspective is needed to account for the role of physical science approaches in multi-scale modeling.

Lilia GurovaAn Inferential Criterion for Goodness of Explanation

A scientific explanation can be 'good' or 'bad' in many ways and some of them have been extensively discussed in recent literature on scientific explanation. However, an important aspect of good explanations seems to have received little attention so far: good explanations increase our understanding of explained phenomena. An inferential criterion for detecting increase in understanding is proposed and it is shown how this criterion could be applied to resolve some controversial issues in science, including the controversy about trait explanations in psychology.

Carsten HeldConditions and Causes

In some sense, necessary and sufficient conditions are mutual converses and being necessary and sufficient conditions is symmetric. In another sense, the opposite is true. I develop an account of conditionship that can separate the two senses. In a second step, I develop an account of causation in terms of necessary conditions and apply it to well-known difficulties in the theory of causation: spurious causation and transitivity, preemption and trumping.

Leah HendersonBringing Virtues Together

A case is often made, particularly by scientific anti-realists, that theory choice in science involves not only confirmational virtues, but also informational or explanatory virtues. Thus a multi-dimensional picture of theory choice is recommended. I will argue that a key motivation for this picture is the mistaken idea that informational or explanatory virtues cannot be accommodated in a probabilistic framework. I will demonstrate how they can be, thus giving a more unified picture of the virtues in

scientific theory choice. This removes what has been held up as a significant obstacle to scientific realism.

Chris Hill

The A Priori - A Defense

I oppose the Quinean view that all statements are in principle empirically revisable. The key idea is that certain statements, including definitions, laws of logic, and laws of mathematics, serve cognitive interests that are to a large extent independent of such empirical concerns as prediction and explanation, and that this fact leads us to accept epistemic norms which imply that the statements in question are immune to empirical revision.

An example is the disquotation schema for truth. It is easily shown that acceptance of instances of this schema is required if one is to use the concept of truth to further such ends as generalized assertion and compression of information so as to fit it into working memory. ("All of Obama's remarks at the press conference were true" will fit into working memory, but the remarks themselves won't.) Moreover, the ends in question are largely independent of empirical commitments. We would need to make generalized assertions and to compress information even if we were to suspend belief in all empirical statements and focus exclusively on mathematics. Hence, the instances of disquotation are empirically unrevisable.

Gábor Hofer-Szabó

On the Meaning of Einstein's Criterion of Reality

The talk has two main theses on Einstein's Reality Criterion. First, we argue that the Reality Criterion is that makes a difference between the EPR argument and Einstein's latter arguments devised against quantum mechanics. We will show that the EPR argument, making use of the Reality Criterion, is devised to show that certain interpretations of QM are incomplete, whereas Einstein's latter arguments, making no use of the Reality Criterion, are devised to show that the Copenhagen interpretation is unsound. Second, we claim that the Reality Criterion is a special case of Reichenbach's Common Cause Principle and also of Bell's Local Causality Principle.

Giora Hon (and Bernard Goldstein)

Maxwell's Methodological Odyssey in Electromagnetism

In addition to his scientific achievements, James Clerk Maxwell was an innovator in methodologies in physics. In fact, in his hands methodology and theory mutually inform one another, an aspect of his work that has not been properly appreciated. We examine closely from a methodological perspective Maxwell's contributions to electromagnetism and uncover a trajectory of great interest, which we call Maxwell's methodological odyssey. There are four principal stations along the fifteen-year trajectory of Maxwell's published writings devoted to electromagnetism. These contributions form a sequence of

different methodologies which culminated in 1873 in his *Treatise on Electricity and Magnetism*. Tracing the path leading to his magnum opus yields novel insights into the various methodologies which Maxwell applied in the course of constructing his epoch-making electrodynamic theory. Indeed, we claim that the framework of the theory is just as important as the empirical facts in this physical domain. Thus, we are persuaded that Maxwell's formulation and application of novel scientific methodologies is no less a feat than proposing a fundamental theory.

Paul Hoyningen-Huene

Is Milton Friedman really an instrumentalist?

Milton Friedman's famous 1953 article entitled "The Methodology of Positive Economics" is one of the most important methodological articles of neo-classical economics. It has been cited very often and has been extremely controversially discussed until today. Based on this article, Friedman is mostly seen as an instrumentalist. Apart from some anomalies, there is plenty of textual evidence to support this ascription. However, I doubt that this ascription is correct. I shall present an alternative interpretation that will also shed some light on Friedman's famous "as if" methodology.

Gürol Irzik (and A. Faik Kurtulmus)

Public Trust in Science

Even though public trust in science is essential for both the individual and the common good, it has not been studied sufficiently in the philosophy of science literature. In this presentation we provide an analysis of public's epistemic trust in science, by which we mean people investing trust in scientists as providers of information. We are concerned not with actual public trust, but with warranted public trust, that is, with conditions under which the public may be said to invest epistemic trust in scientists with warrant (with evidence or good grounds). We distinguish between basic and enhanced epistemic trust in science and provide a characterization for both. We conclude by highlighting the societal preconditions necessary for building public's epistemic trust in science.

Brian L. Keeley

A History of the Philosophical Brain

Throughout history, philosophers have had a lot to say about the nervous system, from Aristotle's proposal that the brain cooled the blood to Descartes' research into the nature of the reflex and the structure and function of nerves. However, the interplay between neuroscience and philosophy ramped up considerably in the postwar years, particularly with the development of Mind-Brain Identity Theory in the 1950s, Feyerabend's coining of "Eliminative Materialism" in the 1960s and the Churchlands' promotion of "Neurophilosophy" in the 1980s. One thing that marks this development is an increasing interest in engaging with the empirical and theoretical details of neuroscience, along with arguments about how philosophical speculation can benefit from such engagement. This makes the recent history

of the philosophy of neuroscience an interesting domain in which to explore the relationship between science and philosophy. This will be a draft of a chapter I've been invited to write for a forthcoming volume: *The Cambridge History of Philosophy, 1945 to 2010*.

Hylarie Kochiras

Newton on Emanative Causation and the Relationship of Perceivers to Space

This talk addresses two questions about Newton's ideas about perceivers and space. The first question concerns only the divine perceiver: what is God's causal relationship to space, and in particular, what does Newton mean when he describes God as the emanative cause of space (and time)? Although an obvious candidate is the sort of logical dependence asserted by Henry More, there are reasons for caution here, not least that Newton rejected some of More's ideas about space. Although a range of interpretations may be found in the secondary literature (even efficient causation, a causal relationship that is, *prima facie* at least, better suited to medieval theories asserting extension to be an attribute of matter and accordingly, a product of God's creation of the world), I conclude that despite other differences with More, Newton largely agrees with his understanding of emanative causation. The second question concerns all perceivers: in holding that perceiving minds have spatial locations, does Newton also hold that they have parts, which could in principle be correlated with parts of space; or does he accept the doctrine of holism? Opposing the view of McGuire and Slowik (OSEMP, vol. VI, 2012), I elaborate the conclusion I sketched earlier (Kochiras, IHR, 2012, p. 68), arguing that he does.

Janet Kourany (and Manuela Fernández Pinto)

A Role for Science in Public Policy? The Obstacles, Illustrated by the Case of Breast Cancer

A coherent and helpful public policy based on science is difficult to achieve for at least three reasons. First, there are the purely practical problems—for example, that scientific experts often disagree on policy-relevant questions, and their debates often continue well beyond policy appropriate timelines. Second, there are the more straightforwardly epistemic problems—for example, that science is hardly the neutral supplier of factual information (information free of contested social values) that traditionally has been supposed. And third, there are the moral and political problems—that given the commercialization of today's science and its enduring limitations (sexism, and racism, and homophobia, and ableism, and so on), much of scientific research today fails to meet the moral and political standards one would expect it to meet in order to inform public policy. In the present paper we spell out these problems in the context of breast cancer policy and suggest the role philosophy of science should play in dealing with the situation.

Fred Kroon

Models, Fictions, and the Problem of the Gap

The Philosophy of Science has recently seen the rise of fictionalism about model-based science: the view that point masses, frictionless planes, infinitely large populations in biology, etc, are nonexistent

fictions, rather like fictional characters in works of fiction. But how, then, should we understand the underlying theory of fiction and the sense in which model systems are nonexistent? And how can model systems so construed possibly allow us to predict or explain features of the real world (what Arthur Fine calls the problem of the gap)? The present paper considers a number of answers to these questions.

Dennis Lehmkuhl

The Problem of Motion in General Relativity

Abstract: The general theory of relativity has two equations at its core: the Einstein field equations, which describe the dynamics of gravitational fields, and the geodesic equation, which is the equation of motion of test bodies subject to gravitational fields. The problem of motion, the query of whether the equations of motion can be derived from the gravitational field equations, has been one of the most important questions both for the foundations of general relativity and for its application to astrophysics. Up to now, philosophers of physics have been concerned merely with one of the two major research programmes aimed at accomplishing such a derivation. They have dismissed the second programme, pioneered by Einstein and Grommer in 1927, as being misguided. However, I will demonstrate that the historical development of this programme shows us that it is closely linked to the search for exact solutions to the gravitational field equations. This, in turn, allows us to link the problem of motion to the dynamics of black holes advanced since the 1960s. We will see that the careful interpretation and conceptual analysis of equations of motion and exact solutions to the gravitational field equations allow for an entirely new perspective on the foundations of general relativity.

Peter Machamer

Evidence for What? And Systematic Reviews

Jean-Pierre Marquis

Shifting Grounds: Why Should Philosophers Care About Higher-Dimensional Categories?

Mathematics evolves in mysterious ways and along unpredictable paths. One of the recent developments underlying various important mathematical domains, for instance algebraic geometry, algebraic topology, differential geometry, is the rise of higher-dimensional category theory. In this talk, I will first try to sketch why higher-dimensional categories are inescapable in contemporary mathematics. I will then argue that this necessity naturally opens the door to the possibility and the conceptual plausibility of entertaining a universe of higher-dimensional categories as a foundational universe. Last but not least, I will sketch some of the philosophical principles grounding this new foundational picture.

James W. McAllister

Effortlessness in Science

Scientists use several rhetorical strategies to enhance the credibility of their findings. Familiar examples are the rhetoric of effort, which involves emphasizing the amount of effort expended in research, and the rhetoric of self-effacement, which leads to the use of the passive voice in publications. I discuss a further, hitherto unrecognized rhetorical strategy that scientists use: the rhetoric of effortlessness, in which an investigator conveys the impression that establishing a result cost that researcher little effort. The rhetoric of effortlessness heightens the objectivity of individual scientific findings, raises the reputation of individual scientists, and propagates an attractive view of science as a whole.

Nikolay Milkov

Theories of Concept Formation: Heinrich Rickert and the Logical Empiricists

In the last decades, Alberto Coffa and Michael Friedman brought to light traces of influence of the Marburg Neo-Kantian Cassirer on the early logical empiricists. Coffa's and Friedman's discussion had strong impact on the students of history of philosophy of science. Recently Thomas Mormann (2006) found out that Carnap's *Aufbau* was also influenced by Heinrich Rickert's theory of values. The present paper shows that Rickert also exerted influence on the philosophy of logical empiricism as a whole, in particular, through his theory of conceptual formation that was at the center of attention of, practically, all logical empiricists.

Bengt Molander

Proven Experience: Knowing-in-action With a Freedom to Judge

I will discuss "practical experience" and judgement in relation to evidence based, or "knowledge based", practice. As a framework I will use an epistemological analysis of knowing-in-action based on ideas from American Pragmatism, William James in particular, and the later Wittgenstein. Attentiveness is a key notion in my analysis.

I will argue that (scientific) propositional knowledge presupposes and builds upon knowing-in-action. "knowing how" in a wide sense, and that practical experience is a form of knowing-in-action. As an example I will refer to Swedish discussions about proven experience in professional teaching practice and teacher education.

Jesús Mosterín

Empirical Support in Cosmology

In cosmology and its underlying physics, we find theories with markedly different degrees of reliability and empirical support. The feasible aim of scientific cosmology is to obtain a reliable theory of the observable universe. The cosmological community also develops speculative theories that go beyond the horizons of the observable universe and dispense with empirical support. The 2016 detection of gravitational waves by the LIGO collaboration (from a signal arrived in 2015) has added new empirical support to the already well checked theory of General Relativity. By contrast, the 2014 announcement by the BICEP collaboration that they had detected in the cosmic microwave background the imprint of

gravitational waves from inflation, in the form of polarization B-modes, had to be withdrawn under further scrutiny.

Wayne C. Myrvold

Context of Communication: What Philosophers Can Contribute

Once an experiment is done, the observations have been made and the data have been analyzed, what should scientists communicate to the world at large, and how should they do it? This, I will argue, is an intricate question, and one that philosophers can make a contribution to. I will illustrate these points by reference to the debate between Fisher and Neyman & Pearson in the 1950s, which I take to be, at heart, a debate about norms of scientific communication. I will argue that scientists need a richer set of tools for communicating epistemic states that may be very nuanced, and will point to way in which philosophers can contribute.

Dan Neshier

Epistemic Logic: All Knowledge Is Based on Our Experience, and Epistemic Logic Is the Cognitive Representation of Our Experiential Confrontation in Reality

Epistemic Logic is our basic universal science, the method of our cognitive confrontation in *reality* to prove the truth of our basic cognitions and theories. Hence, by proving their true representation of reality we can self-control ourselves in it, and thus refuting the Berkeleyian *solipsism* and Kantian *a priori*. The conception of epistemic logic is that only by proving our true representation of reality we achieve our knowledge of it, and thus we can prove our cognitions to be either true or rather false, and otherwise they are doubtful. Therefore, *truth* cannot be separated from being proved and we cannot hold anymore the *principle of excluded middle*, as it is with formal semantics of metaphysical realism. In distinction, the intuitionistic logic is based on subjective intellectual feeling of correctness in constructing proofs, and thus it is epistemologically encapsulated in the metaphysical subject. However, *epistemic logic* is our basic science which enable us to prove the truth of our cognitions, including the epistemic logic itself.

I dedicate this work to the memory of the late Jaakko Hintikka, an astute philosopher and a dear friend, the pioneer of Epistemic Logic.

Antigone M. Nounou

Model-based Scientific Understanding Without Explanation

Models that represent their target systems can be thought of as indirect resources of scientific understanding (SU) in that they constitute bases for explanations and, therefore, for explanation-induced SU. And yet, models that *patently* misrepresent their target systems cannot explain their behaviour. Hence, the idea that the models saving the phenomena also confer SU of them should be expanded in order to encompass the cases where explanations are missing. To do so, we analyze the

meaning of 'patent misrepresentation' in terms of topological notions while identifying the structural elements of the target systems that are accurately captured by such models.

Cailin O'Connor
Games and Kinds

The 'cluster kinds' view of the natural world attempts to replace older accounts of natural kinds, where objects are grouped using necessary and sufficient conditions for kind membership. On the cluster kinds picture, objects in the world can be thought of as positioned in a multidimensional space where dimensions correspond to various real world properties (size, color, shape, smell, texture, etc.) A central claim of this account is that, in fact, most types of objects will cluster into small, easily separable groups, or cluster kinds. Because these kinds tend to be separated from others by plenty of empty space (in this multidimensional construct), we can expect linguistic terms to appropriately glom onto them.

This paper will use tools from evolutionary game theory to assess whether, in fact, linguistic terms should be expected to track such cluster kinds (assuming they exist). In particular, I use the sim-max game, first introduced by Jager (2007), to model language acquisition in the sort of world described by proponents of the cluster kinds view. With this framework in hand, I explore under what sorts of conditions linguistic terms evolve that in fact track real kinds and under what conditions they do not. Ultimately, I argue that the picture from authors like Millikan is overly optimistic in at least two ways. First, it does not account for the role of perception and perceptual categorization in linguistic term formation. Second, and perhaps more crucially, it downplays the key function of both perception and language---facilitating action. If one takes the role of action appropriately into account, it becomes clear that in many cases one expects linguistic terms to evolve to track real-world categories that do not constitute cluster kinds.

Mael Pegny

AFCAL: The Evolution of an Association and the Emergence of Computer Science in France (1957-1967)

Founded in 1957, the *Association Française de Calcul* (AFCAL) was the first French society dedicated mainly to numerical computation. Its rapid growth and amalgamation with sister societies in related fields (Operations Research, Automatic Control) in the 1960s resulted in changes of its name and purpose, including the invention and adoption of the term *informatique* in 1962-1964, then of the adoption of *cybernétique* in 1967.

In this presentation, I will show the role of this association in the emergence of the new discipline of computer science in France, and draw some lessons on the relations between institutionalization and the emergence of new intellectual traditions. Joint work with Pierre-Éric Mounier-Kuhn.

Laura Perini

Art At the Heart of Science

There is a growing philosophical literature investigating visual representations in science, but there has been little exploration of how distinctively aesthetic properties of scientific images intersect with their uses in the process of conducting scientific research, in the articulation and defense of new conclusions, and in pedagogy. It might seem that whether an image is gaudy, or delicate, or balanced, to take a few examples, is irrelevant to understanding scientific reasoning with images, or even worse, simply presents a distraction. In this presentation I will draw on concepts from the philosophy of art and aesthetics and show how these can be usefully applied to illuminate epistemic issues concerning scientific visualization.

Slobodan Perovic

Epistemic Efficiency in Big Physics Experiments

Identifying optimal ways of organizing exploration in particle physics mega-labs is a challenging task that requires a combination of case-based and formal epistemic approaches. In our (co-authored with S.Radovanovic, V.Sikimic and A.Berber) data-driven study we employed data envelopment analysis (DEA) on a series of experiments performed in Fermilab in order to test their efficiency in terms of variations of team composition (team size and a number of teams per experiment). Our data analysis focused on inherent connections between team composition and diversity of teams and experiments, and wider relevant factors (e.g. seniority of staff). I discuss whether and how the epistemic efficiency requirement of small, decentralized, and diverse teams that our results (and the results of similar studies across sciences) imply could be met in contemporary high energy physics in physically and technologically plausible ways.

Johannes Persson, Niklas Vareman, Annika Wallin, Lena Wahlberg, and Nils-Eric Sahlin

Science and Proven Experience: A Conceptual Geography

A key question for evidence-based medicine (EBM) is how best to model the way in which EBM should “[integrate] individual clinical expertise and the best external evidence” (Sackett et al. 1996). We argue that the formulations and models available in the literature today are modest variations on a common theme and face very similar problems. For example, both the early and updated models of evidence-based clinical decisions presented in Haynes, Devereaux and Guyatt (2002) assume (with Sackett, et. al., 1996) that EBM consists of, among other things, evidence from clinical research and clinical expertise. On this A-view, EBM describes all that goes on in a specific justifiable medical decision. There is, however, an alternative interpretation of EBM, the B-view, in which EBM describes just one component of the decision situation (a component usually based on evidence from clinical research) and in which, together with other types of evidence, EBM leads to a justifiable clinical decision but does not describe the decision itself. This B-view is inspired by a 100-years older version of EBM, a Swedish standard requiring medical decision-making and practice to be consistent with ‘science and proven

experience'. In the paper we outline how the Swedish concept leads to an improved understanding of the way in which scientific evidence and clinical experience can and cannot be integrated in light of EBM. In addition the paper sketches the as yet unexplored historical background to EBM.

Demetris Portides

How Idealization and Abstraction could be distinguished

Broadly speaking, there are two schools of thought on how to distinguish between idealization and abstraction. Depending on the language favored by each author, the first one regards idealizations as particular forms of abstraction or abstractions as particular forms of idealization. The second one sees two distinct thought processes, or cognitive acts, operating in model-building: one strictly associated with abstraction and the other strictly associated with idealization. In this paper I argue that attempts that fall within the second school of thought fail to provide an adequate distinction. I further argue that both idealization and abstraction are particular forms of a cognitive process of *selective attention*.

Hernán Pringe

Kant and Maimon on Mathematics and Metaphysics

Maimon criticizes how Kant understands the synthetic a priori character of mathematics. By discussing this criticism, I shall analyse how mathematics and metaphysics get interwoven in Maimon's theory of differentials. This theory establishes a parallelism between two relationships: the mathematical relationship between the integral and the differential and the metaphysical one between the sensible and the supersensible. I shall argue that such parallelism will be the clue to the Maimonian solution to the Kantian problem of the possibility of metaphysics as a science.

Athanassios Raftopoulos

Reframing Cognitive Penetrability

I have argued that early vision is not directly affected by cognition since it does not draw on cognition as an informational resource, which is the essence of the claim that perception is cognitively penetrated (CP); early vision is cognitively impenetrable (CI). There are, however, indirect cognitive effects on early vision, such as the various pre-cueing effects and one should examine whether these entail that early vision is CP. I answer this question negatively in three steps. First, I argue that whether a set of perceptual processes is CP hinges on whether the cognitive effects could undermine the role of these processes in grounding beliefs. Second, I examine the epistemic role of early vision. I argue, third, that the indirect cognitive effects do not undermine the epistemic role of early vision; therefore, early vision is CI.

Miklos Redei

Having a Look at What a Bayesian Agent Cannot See (the Bayes Blind Spot)

The talk investigates some properties of Bayesian learning with an emphasis on what probabilities a Bayesian Agent can learn by conditionalizing on a possibly uncertain evidence he has about elements in a finite Boolean algebra. We define the Bayes Blind Spot of an Agent as the set of probability measures that are absolutely continuous with respect to the background probability (prior) of the Agent and which the Agent cannot learn no matter what evidence he has. We show that if the Boolean algebra is finite then the Bayes Blind Spot is a very large set.

Joshua Rosaler

Reduction as an *A Posteriori* Relation

Reduction between theories in physics is often approached as an *a priori* relation in the sense that reduction is often taken to depend only on a comparison of the mathematical structures of the theories. I argue that such approaches fail to capture one crucial sense of "reduction," whereby one theory encompasses the set of real behaviors that are well-modeled by the other. Reduction in this sense depends not only on the mathematical structures of the theories, but also on empirical facts about where our theories succeed at describing real systems, and is therefore an *a posteriori* relation.

Sherri Roush

The Epistemic Superiority of Experiment to Simulation

This paper defends the naïve thesis that the method of experiment has per se an epistemic superiority over the method of computer simulation, other things equal, a view that has been rejected by some philosophers writing about simulation, and whose grounds have been hard to pin down by its defenders. I further argue that this superiority does not depend on the experiment's object being materially similar to the target in the world that the investigator is trying to learn about, as both sides of dispute over the epistemic superiority thesis have tended to assume it must. Surprisingly the advantage of experiment is only unconditional for internal validity but the reason it is so explains the naïve intuition of its advantage. For external validity, whether experiment or simulation has an advantage depends in a principled way on how abstract are the regularities in the world that determine the answer to the particular question at issue, and whether they are dynamical or structural.

Howard Sankey

A Dilemma for Scientific Realism

Scientific realism is confronted by a dilemma which arises from the alleged incompatibility of science and common sense. Suppose we accept science and reject common sense. This is to reject the evidential basis for science, since observation is part of common sense. The alternative is to accept both science and common sense. This preserves the evidential basis for science. The incompatibility remains. I propose to go between the horns of the dilemma. I distinguish widely held belief from basic

common sense. Basic common sense is preserved and is the basis for science. Widely held beliefs come and go.

Samuel Schindler and Raphael Scholl

Historical Case Studies as Model Organisms

The use of historical case studies in philosophical theorizing about science is inherently problematic: single cases are claimed to be representative of large parts of science. On the face of it, such inferences are entirely ungrounded. And yet, it seems that such inferences are not impossible. Geneticists regularly and successfully reason from very limited sets of organisms to indefinitely many. In this paper we explore whether the philosophical use of historical case studies could work analogously.

Raphael Scholl

Unwarranted assumptions: The Neglect of the *Vera Causa* Principle

There is a mistake in the received view of the history of scientific method. Laudan and others have claimed that during the 19th century, the Newtonian "*vera causa* principle" was abandoned because of its inherent limitations: in particular, its scope was taken to be restricted to inferences about observables. Methodologists instead accepted versions of consequentialism or the method of hypothesis. I will show this account to be historically and philosophically false: in biological and medical practice, the *vera causa* principle was developed into a workable method of inquiry -- one fully capable of inferences about unobservables -- precisely during the time of its supposed demise.

Oron Shagrir

In Defense of a Semantic View of Computation

A semantic view of computation states that computational states are type-individuated at least in part by their semantic properties. I will firstly rebut several arguments that are advanced against the semantic view (e.g., in Piccinini 2008; 2015). I will then outline an argument supporting the semantic view, which appeals to the phenomenon of simultaneous implementation (Shagrir 2001; Sprevak 2010; Rescorla 2013; Shea 2013). My argument rests on a distinction between the notions of implementation and computation. While implementation can be characterized in non-semantic terms, computation is essentially semantic.

Arto Siitonen

Eino Kaila's Contribution to Finnish Philosophy

The philosopher and psychologist Eino Sakari Kaila (1890– 1958) brought new ideas to Finnish philosophy. He was professor of theoretical philosophy at the University of Turku from 1921 to 1930, and at the University of Helsinki from the year 1930 on.

Kaila published first psychological studies. After this, he turned his attention to logical and mathematical questions. In Turku, he published in German language works concerning chance and causality, probability logic and deduction. His ideas of synthetic philosophy were important and innovative. His critical studies of logical neo-positivism were something new in Finnish philosophy.

Kaila wrote also in Finnish and took part in the Finnish scientific discussion with his works 'Human Knowledge' and 'Personality', and his review on three hundred years of Finnish university life.

In my paper, I will clarify the significance of Eino Kaila in the history of Scandinavian philosophy.

Kyle Stanford

Uniformitarianism, the Maddy/Wilson Principle, and a Middle Path Forward in the Scientific Realism Debate

Stanford suggests that the historical evidence used to challenge scientific realism should lead us to become Uniformitarians, but many recently influential forms of scientific realism seem happy to embrace this commitment. I trace a number of further points of common ground that collectively constitute an appealing Middle Path between classical forms of realism and instrumentalism, and I suggest that many contemporary realists and instrumentalists have already become fellow travelers on this Middle Path without recognizing how far they have thereby diverged from those who share their labels and slogans. I conclude by describing their central remaining disagreement and some considerations favoring one side in that disagreement.

Werner Stelzner

Iterated Dispositions and Principles of Introspection

The acceptability of solutions concerning principles of (positive or negative) introspection and concerning (positive or negative) logical relations between mental attitudes (e.g. proposed by systems of epistemic logic based on possible-worlds-semantics) depends essentially on the kind of attitudes considered:

- Conscious or unconscious mental attitudes
- Attitudes treated as actualities or dispositions
- Explicit or implicit attitudes.

The treatment of attitudes like belief or knowledge as actual conscious mental states prevents the soundness of any principles about logical or introspectional relations between mental attitudes. So, the justification of the mentioned principles should be based referring to unconscious attitudes: implicit actual or dispositional attitudes.

However, if introspection means an actual or dispositional conscious attitude directed to the attitudes of the believer, then the soundness of introspection principles is not secured by the implicit

treatment of mental attitudes, because the mental subject usually has neither an actual nor a dispositional conscious access to its own implicit attitudes.

The only place for the validity of introspection principles is the dispositional treatment of mental attitudes. Following this, the so called introspection principles are principles about iterated dispositions and we have to focus on iterated dispositions in order to justify or deny the validity of introspection principles.

Susan Sterrett

The Use of Analogy in the Works of Darwin, Einstein, and Turing

To point out that a scientist has credited his or her intellectual progress on a question to the use of analogy still leaves a lot unanswered. We still want to know: "What is the structure of the reasoning by analogy, and what is it about the line of reasoning that would make it count as reasoning by analogy?" In this talk, I begin, not with an account of analogy, but with a close look at the reasoning used in discussions in which scientists explicitly cited the use of an analogy in their reasoning: Darwin's work on analogous principles in artificial and natural selection; Einstein's work on principles of special relativity, and what I see in it as a use of principles akin to Mach's work on the analogy between light and sound; and Turing's analogy between computing machinery and the brain, which he took to be a 'guiding principle.' This work extends work presented in earlier talks ("Analogous Principles" and "The Use of Analogy . . .").

Drozdtoj St. Stoyanov

Non-conventional Approaches to Validation in Psychiatry: Meta-empirical Considerations

I shall present in this paper a comparative study of the post-modern non-conventional approaches to validation in clinical psychology and psychiatry. There are highlighted such novel theoretical models, like Research Domain Criteria, Four Domains of Mental Illness, structural validity, etc. Those are then compared to the development of the model of trans-disciplinary (or translational) validation (Stoyanov, Machamer, Schaffner, 2013; Stoyanov, Borgwardt, Varga, 2014), aiming to integrate scientific expertise in psychiatry in terms of conformable dialogue. Preliminary empirical data will be delivered in this talk to underpin the basic assumptions of our theoretical model. Certain caveats of the different models from an epistemological perspective will be presented as well.

Michael Stuart

Imagination in the Lab

Imagination plays many roles in science, some of which are epistemological. There are a number of data sources relevant for explaining these roles. For example, literature in the history and philosophy of science has produced case studies and general considerations that are extremely helpful. And there is also much to learn from cognitive science, although the studies here are mostly performed on non-scientists. What's missing from the discussion is in-depth ethnographic data on how scientists imagine in the laboratory. I present and discuss the results of one such ethnography that I recently performed

while at the Center.

David J. Stump

Is There a Metaphysical Element in Science? The View From the Relative a Priori

Some philosophers of science have recently supported the idea of the metaphysics of science (with conferences, a society, publications, etc.). Metaphysics, they claim, is a necessary and important part of theorizing about the natural world. One might think that a viewpoint that held that there is a relative or dynamic a priori element in science would be committed to some form of metaphysics of science. I will argue that this is not necessarily the case, despite the fact that it may not be possible to form a strict boundary between the claims of metaphysics and those of science.

László E. Szabó

Empirical Definitions of Spatiotemporal Conceptions

First I will argue for the inevitability of a coherent, non-circular system of operational definitions of the basic spatiotemporal quantities, in terms of which the empirically testable spatiotemporal statements of physics should be expressed. A few examples will illustrate that the task is not trivial if the definitions should hold with high precision. In my talk, I will outline a possible construction of such operational definitions. It will be seen that a complete collection of the usual spatiotemporal conceptions would require the satisfaction of certain conditions that have never been tested. Finally, some open problems and future work will be discussed.

Tadeusz Szubka

Global Expressivism and Scientific Realism

Some efforts have been recently made to replace various local varieties of expressivism by one global expressivism, having the theoretical capacity to undermine the dominant representational paradigm by overcoming the traditional distinction between descriptive and non-descriptive uses of language. Such a bold strategy has been undertaken by Huw Price (2011, 2013) and Allan Gibbard (2015). The outlined general picture is theoretically fascinating, but it badly needs further elaboration and application. The paper will be an attempt to apply the framework of global expressivism to the scientific realism debate, and to compare it with Bas C. van Fraassen's metaphilosophical expressivism, namely with his account of philosophical views as expression of stances or attitudes (van Fraassen 2002, 2015).

Stavroula Tsinorema

Personal Identity and its Discontents. Dementia, Prospective Autonomy and the "Other Self Problem"

The paper discusses an epistemological challenge raised by Rebecca Dresser and John Robertson against the normative authority of a competent individual's prospective dominion over post-competency matters, such as medical interventions, organ donation, autopsy, etc. Relying on an extension of Derek Parfit's view on personal identity, they mount an attack on the moral authority of "precedent autonomy" (cf. Ronald Dworkin) as implemented by "advance directives" or "living wills". Their objection is that the very process which renders an individual incompetent and brings about the advance directive can destroy the conditions that are necessary for personal identity and, thereby, undermine the binding moral force of such advance directive. The epistemological ground of the objection lies in the assumption that, whatever the correct theory of personal identity, it will include the claim that psychological continuity of a certain kind is necessary for personal identity. If continuity of mental states (including memories, affective states, dispositions) is severely interrupted, then persistence of personal identity is also called into question. In extreme cases of rupture of continuity and connectedness, as in cases of severe dementia, an incompetent, severely demented individual may be in effect a different self from the self who previously formulated an advance directive. In such cases, the author of the directive would have no moral authority to decide what should happen to the incompetent individual and thus no right to "harm" the latter by directing the withholding or withdrawing of life-sustaining medical treatment.

The paper will challenge the Dresser-Robertson thesis and argue that (a) Parfit's argument cannot be extended to support their claims, (b) were it to be extended, considerations about (Parfitian) personal identity would have a different import on ethics and bioethics, and (c) despite the failure of the attempt to extend Parfit's argument as suggested, an alternative ground for a certain kind of appeal to considerations about persons in ethics and bioethics can be defended; the latter's bare bones will be outlined.

Dana Tulodziecki

The Zymotic Theory of Disease: Lessons for HPS

In this paper, I will argue that neither realist nor anti-realist accounts of theory-change can account for the transition from zymotic views of disease to germ views. I trace this failure to the way the realism-debate is set up, and argue that approaching the zymotic case through either the realist or anti-realist lens obscures some of the most interesting features of this transition – features that can only be understood by taking an integrated HPS approach to this episode, which leaves behind many of the features of the current realism-debate.

Matthias Unterhuber

Two Types of Ceteris Paribus/Normalcy Conditions, as Exhibited by Biology and Other Sciences

The paper discusses ceteris paribus (cp) laws. It criticizes the currently dominant approach, which reconstructs cp laws as high level generalizations. I introduce an alternative taxonomy of normalcy conditions as exhibited by cp laws that makes the shortcomings of this approach apparent. To this end,

the role of viviparity in the reproduction/paternal care system of mammals – monotreme, marsupials, placentals – is discussed and contrasted with viviparity as found in sharks.

Ioannis Votsis

Materiality Does not Equal Lack of Generality

Norton (2003) develops a material theory of induction that urges us to go local. Why? Because inductive inferences in science are, according to him, “grounded in matters of fact that hold only in particular domains” (p. 647). This theory has been put to work by Saatsi (2009) who uses it to prop up the content-driven or local view of arguments for scientific realism. On this view, which has rapidly been gaining ground, general arguments for or against realism like the no miracles argument and the argument from the pessimistic meta-induction are doomed to fail. The war will be won or lost instead on the many battlefields where specific arguments, the kinds that cite material postulates, reign supreme. In this talk, I counter Saatsi’s anti-generalist tendencies while at the same, and prima facie paradoxically, supporting the central message behind the material theory of induction.

Ken Waters

No General Structure

This talk introduces a distinctive approach for scientific metaphysics. Instead of drawing metaphysical conclusions by interpreting the most basic theories of science, I draw metaphysical conclusions by analyzing how multifaceted practices of science work. Broadening attention opens the door to drawing metaphysical conclusions from a wide range of sciences. I analyze conceptual practice in genetics and argue that the reality biologists engage lacks an overall structure. I expand this conclusion to motivate the *no general structure thesis*, which states that the world lacks a general, overall structure that spans scales. I conclude by arguing that this is a metaphysical thesis that matters; it informs science as well as philosophy of science, and it provides useful perspective for societies that look upon science to help solve complex problems in our changing world.

James Owen Weatherall

Some New Work on Equations of Motion

Abstract: I will discuss some recent work by myself and Bob Geroch on particle equations of motion in the context of space-time theories. I will show how the distributional (delta function) approach to equations of motion relates to "curve first" results widely discussed in the literature, including the Geroch-Jang and Ehlers-Geroch theorems. I will also show how these latter results can be extended to forced motion, in relativistic and classical contexts.

Paul Weirich

Risk as a Consequence

Because an option's evaluation reviews the option's relevant consequences, decision theory needs a characterization of these consequences. A relevant consequence is an event the agent cares about, but beyond this an apt characterization depends on how evaluations of options use consequences. For some evaluations, the characterization of an option's relevant consequences includes every consequence the agent cares about, but for other evaluations it omits some of these consequences. This paper argues (1) that the aptness of a narrow or broad account of an option's relevant consequences depends on whether evaluation of options uses only an agent's preferences or also the agent's independently defined probability and utility assignments and (2) that an option's broad evaluation is relative to the agent's perspective in the world that the option produces and therefore appropriately reviews the option's risk.

Jan Woleński

Some Liar-like Paradoxes

The classical Liar paradox is as follows

- (a) (1) the sentence (1) is false;
- (b) $(1) \Leftrightarrow (1)$ is true;
- (c) The sentence (1) is false \Leftrightarrow The sentence (1) is true;

Tarski, following Leśniewski, diagnosed that the paradox is associated with

- (A) Self-referentiality;
- (B) T-scheme
- (C) Classical logic

A note: rejecting (C) does not help because we have the strengthened Liar generated by the sentence "this sentence is not true (false or other)".

We can construct several Liar-like paradoxes, for instance of meaninglessness:

- (a) An additional principles: A is meaningful $\Leftrightarrow \neg A$ is meaningful; A is meaningful if and only if A is true or false;
- (b) (1) (1) is not meaningful;
- (c) (1) is true \Leftrightarrow (1) is not meaningful;
- (d) Assume that (1) is true; hence (1) is not meaningful; but (1) is meaningful as true;
- (e) Assume that (1) is false; hence (1) is meaningful, but $\neg(1)$ jest meaningful and true; hence $\neg(1) \Leftrightarrow (1)$ is meaningful; hence $(1) \Leftrightarrow (1)$ is not meaningful; hence we return to the former case;

Analogical paradoxes can be formulated for (un)rationality, (un)testability, etc. A general lesson: If a principle P establishes meaning of a predicate W referring to properties of sentences such that T-scheme is applicable, we can expect that the predicate in question can generate a Liar-like paradox. However, it does not mean that philosopher must resign from P . Generalizing the truth case P is formulated in **ML** and apply to items formulated in **L**. The only moral is that the criteria from **L** have to be supplemented by something else.

Gereon Wolters

On Having the Last Word: Epistemological and Normative Considerations

Many people tend to insist on having the last word on whatever issue. This seems to be connected with exerting power on others. Even cognitive contexts rather power than truth, or better authority connected with power has been the central issue. Only enlightened rational thinking, most popularly expressed in Karl Popper's Logic of Scientific Discovery, came to the conclusion that even in science there is no last word. One should fight – this is the normative part of the paper – both the ongoing claims to the last word in cognitive matters by religious fundamentalists and “postmodern” Western relativism. The latter correctly joins modern philosophy of science in rejecting the last word, denies, however, that there are objective second last words, based on universalizable arguments and evidence.

António Zilhão

Whither Rationality?

The debate concerning human rationality has been revolving around four main standpoints: 1) Unbounded rationality, 2) Optimization under constraints, 3) Heuristics and biases, and 4) Ecological rationality. Typically, proponents of 3) and 4) criticize models 1) and 2) for their cognitive unrealism. However, many ethologists contend that it makes sense to account for data gathered in animal behaviour research along the lines defined by the latter models. Elaborating upon this contention, Stanovich suggested recently a fifth standpoint in this debate – I'll call it 'Brute Rationality'. According to it, traditional rational choice models are more appropriate to account for the behaviour of creatures endowed with simple cognitive architectures rather than to account for human behaviour.

In my talk, I'll contend that the term 'rationality' is being used in this debate to cover too wide a semantic area. In fact, once one distinguishes the different meanings associated with it, the positions defining this debate reveal themselves to be much less clear than what is usually taken to be the case.