From ɸ-science to practical realism: an international conference in honour of Rein Vihalemm (1938–2015)

August 13-14, 2019, University of Tartu, Tartu, Estonia
Jakobi 2, room 336

Book of Abstracts

UNIVERSITY OF TARTU
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Conference programme

Tuesday, 13 August

9.00–10.00 – *Registration & coffee*

Session 1 (10.00–12.30)

10.00–10.30	Opening
10.30–11.30	Eric Scerri, UCLA (keynote). On the debated nature of the periodic table and the periodic law.
11.30–12.00	Mahdi Khalil, Sharif University of Technology. Truth without Reference: A Response to the Pessimistic Induction.
12.00–12.30	Elena Trufanova, Institute of Philosophy, Russian Academy of Science. Elusive reality and social constructions.

12.30–14.00 – *Lunch*

Session 2 (14.00–16.00)

14.00–15.00	Olimpia Lombardi, University of Buenos Aires, CONICET (keynote). Two-level relationships between theories: different realist interpretations.
15.00–15.30	Eveli Neemre, University of Tartu. The Problem of Value Recognition.
15.30–16.00	Kalevi Kull, University of Tartu. Phi-science(s), sigma-science(s), and their combination(s): positioning semiotics.

16.00–16.30 – *Coffee break*

Session 3 (16.30–19.00)

16.30–17.30	Peeter Müürsepp, Tallinn University of Technology (keynote). Is Metaphysics Exhausted? The Kantian Roots of Practical Realism.
17.30–18.00	Ave Mets, University of Tartu. Measurement-theoretical view on the evolution of the periodic system of chemical elements.
18.00–18.30	Bruno Mölder, University of Tartu. Is the mental special?
18.30–19.00	Alexander Pechenkin, Lomonosov Moscow State University, Vavilov Institute of the History of Science and Technology. The interconnection between physics and chemistry from the point of view of the philosophy of science.

19.30–… – *Conference dinner at Restaurant Hõlm, Ülikooli 14.*

Wednesday, 14 August

Session 4 (10.00–12.00)

10.00–11.00	Hasok Chang, University of Cambridge (keynote). Systems of Practice as Ways of Understanding.
11.00–11.30	Jaana Eigi, University of Tartu. Thinking about expertise and democracy: how studying practices may make a philosopher want to change them.

11.30–12.00   Ovidiu Babeș, University of Bucharest. Individuating scientific practices: Anscombe and action descriptions.

12.00–12.30 – *Coffee break*

Session 5 (12.30–13.30)   Sami Pihlström, University of Helsinki (keynote). Postfactualism as a Descendant of the Pragmatist Theory of Truth?

13.30–15.00 – *Lunch*

Session 6 (15.00–16.30)
15.00–15.30   Juho Lindholm, University of Tartu. John Dewey as a Precursor of Rein Vihalemm.
15.30–16.00   Kristin Kokkov, University of Tartu. Scaffolding in the scientific theory formation.
16.00–16.30   Marij van Strien, Bergische Universität Wuppertal. Realism, Pluralism and Postmodernism in Quantum Physics: Bohm and Feyerabend.

16.30–17.00 – *Coffee break*

Session 7 (17.00–19.00)
17.00–17.30   Triin Vihalemm, University of Tartu. How researchable are social practices? A quick look at the sociological research of lifestyle interventions.
17.30–18.00   Amirouche Moktefi, Tallinn University of Technology. The Philosophy of Mathematical Practices: The role of Diagrams.

18.00–… – *Closing of the conference*

Abstracts

On the debated nature of the periodic table and the periodic law.

Eric Scerri, UCLA, Los Angeles

In several publications, some of which were published in the journal Foundations of Chemistry, Rein Vihalemm referred to the periodic table of the chemical elements as an example of the φ-science aspect of chemistry. For Vihalemm chemistry was to be regarded as being based on a law of nature, namely the periodic law, that is similar to laws in physics, in being quantitative and enabling one to predict and explain innumerable individual observations. My lecture will examine the status of the periodic law and its explanatory power according to Vihalemm and other authors. This re-examination is especially appropriate this year that has been named the International Year of the Periodic Table or IYPT by UNESCO[1].

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[1] https://www.iypt2019.org/

Truth without Reference: A Response to the Pessimistic Induction

Mahdi Khalili, Sharif University of Technology

Larry Laudan argues against the No-miracle Argument by providing some counterexamples, drawing on the assumption that truth without reference is inconceivable. Against his position, I propose what I call Blurred Realism, according to which a successful theory as a whole is (approximately) true, even though it is impossible to prospectively specify which terms of that theory are properly referring. A more successful theory is less blurred than its less successful predecessors; accordingly, scientific progress is a process of discovering reality by progressively encroaching upon it via new concepts. Blurred realism equips realists with a strategy to account for the successes of an abandoned theory: those successes can be restated using the terms of current theories. I argue that this strategy is enough to refute Laudan's argument; also, it is preferable to the selective realists' strategies (including Psillos's *divide et impera* strategy, Vickers's suggestion, and Structural Realism). Finally, as a case study, I demonstrate that the accurate explanations of Ptolemaic astronomy concerning the paths of the outer planets can be restated in the vocabulary of Kepler's laws of planetary motion, the latter being a currently accepted theory.

Elusive reality and social constructions

Elena Trufanova, Institute of Philosophy, Russian Academy of Science

The paper deals with the realism vs anti-realism debate in the field of scientific and epistemological realism, taking into consideration social constructionist movement and its anti-realistic stance. Social constructionists suggest that instead of one universal scientific knowledge many "situated knowledges" should be proposed when each social group will be given "voice" to express its opinion about the world. However, the author of the paper remains critical towards social constructionist arguments. Their main theses suggest that nearly everything we know about the world is "social constructions". But does "socially constructed" means "not real"? Social constructionists mostly use the linguistic understanding of "social construction" – the ways we talk about an object is what "constructs" it. Different cultures and social groups have different ways of speaking about the same objects which according to social constructionism means there is no reality behind these descriptions, or at least we are ignorant about it. Social constructionism claims that words build our realities and only words transform them. Do social constructions hold no reality of their own? The concept of "President" is clearly socially constructed, but if we try to get rid of it, will the words be enough to do it if all of us just decide against using both the word and the idea of "President"? That is hardly possible – to get rid of "President" concept we should probably need to face a very real revolution. That means there is some reality connected to this word. The problem of reality is very acute in the present day media-saturated world, where each event gets a variety of media coverage with quite different versions of reality. The main question of reality nowadays goes beyond the scientific or epistemological realism and becomes the question of mutual understanding between people.

Two-level relationships between theories: different realist interpretations

Olimpia Lombardi, University of Buenos Aires – CONICET

At present there is a wide consensus regarding that realism in science cannot be disconnected from the practice of science itself. However, practice is usually conceived in terms of laboratory activities: science is practical due to its experimental side. But this view forgets that theoretical activities are also part of the practice of science: theoretical scientific practice is also essential to the discussions about realism. In this context, how the relationships between scientific theories are interpreted contributes to the discussions in a significant way.

In this talk I will begin by arguing that relevant cases of relationships between scientific theories − in particular, those traditionally conceived in terms of reduction − involve two steps, an *intra-theory* relationship and an *inter-theory* relationship, usually mediated by an *intermediate theory* that supplies the link between the two original theoretical domains. I will illustrate this view with three examples, stressing the analogies among them: (i) thermodynamics and classical mechanics, mediated by classical statistical mechanics, (ii) classical mechanics and quantum mechanics, mediated by the theory of decoherence, and (iii) structural chemistry and quantum mechanics, mediated by the quantum theory of atoms in molecules (QTAIM). Finally, by focusing on the third example, I will consider how the two steps involved in the relationship − the intra-theory step linking quantum mechanics and QTAIM and the inter-theory step linking QTAIM and structural chemistry − can be interpreted from different realist perspectives.

The Problem of Value Recognition

Eveli Neemre, University of Tartu

In my presentation, I attend to the problem of recognizing the values influencing science and using value conflicts as indicators of values. In the debate over values in science, significant attention has been paid to the questions of which values should influence science and the legitimacy or illegitimacy of these influences. Underneath these discussions, however, there is a wider topic that has not been discussed so vividly. This topic is value recognition. Since value recognition is important to both parties of the value debate, it merits some discussion. Proponents of value-free science need to recognize and distinguish between epistemic and non-epistemic values to pay attention to the possible non-epistemic value interferences in science. Similarly, proponents of values in science position need to be aware of all the relevant values in science to identify their proper roles. However, it seems that it is taken for granted that scientists are always aware of the values that potentially influence them. In practice it does not seem to be the case. There are many examples from the history of science to indicate that scientists are not always aware of the values influencing them illegitimately or otherwise. Scientists, as all humans, generally seem to remain blind to the value influences. The premise of my presentation is that values that influence science come forth more vividly in the context of different value conflicts. Therefore, value conflicts can serve as value indicators and investigating value conflicts can uncover valuable information about values influencing science.

Keywords: Value recognition, value conflicts, values in science

Phi-science(s), sigma-science(s), and their combination(s): positioning semiotics

Kalevi Kull, University of Tartu

Which are the natural parts of Wissenschaft as a whole was a topic of many conversations we had with Rein Vihalemm. Our particular interest here concerns biology, medical sciences, and especially semiotics.

That semiotics has a remarkable position for philosophy of science, has been noticed already long time ago. If physical sciences can be described, following Rein Vihalemm, as phi-sciences, then among non-phi-sciences we find those based on natural history (partly chemistry, geology, biology) and those studying the kinds knowledge (humanities, partly social sciences, partly biology, partly medicine). We have used the name sigma-sciences for the latter, which would almost exactly cover the scope of semiotics.

In this context, mentioning John Lock's division of sciences (into physics, ethics, and semiotics), we are going to discuss the views of Charles Morris (Foundations of the theory of signs, in the International Encyclopedia of Unified Science, 1955), Walker Percy (Semiotic and a theory of knowledge, 1957), and Umberto Eco (From the Tree to the Labyrinth, 2014) on the scope of semiotics, in the light of recent discussions on the topic.

Reference:

Kull, Kalevi 2017. On the limits of semiotics, or the thresholds of/in knowing. In: Thellefsen, Torkild; Sørensen, Bent (eds.), *Umberto Eco in His Own Words. (Semiotics, Communication and Cognition 19.)* Berlin: De Gruyter Mouton, 41–47.

Keywords: sigma-sciences, semiotics, biosemiotics, *Wissenschaft*

Is Metaphysics Exhausted? The Kantian Roots of Practical Realism

Peeter Müürsepp, Tallinn University of Technology

In order to obtain a full picture of the development of Rein Vihalemm's thinking that led him to introducing practical realism, the issue of the Kantian roots of his ideas have to be addressed. Vihalemm paid a lot of attention to Kant's conception of proper science. Having been educated in the Soviet Union in the Marxism dominated philosophical environment, Vihalemm developed his interest in Kant and many other Western philosophers from the basis of his interpretation of Karl Marx's approach to practice. The connections in Vihalemm's thoughts become even more intriguing if we notice that rediscovering both Kant and Marx seems to be motivated by studying Martin Heidegger's philosophy and explaining it in the context of the philosophy of science. For Heidegger, philosophy is primarily metaphysics. However, Vihalemm concludes one of his papers published in 2013 with the statement that metaphysics is exhausted. As we know, Immanuel Kant's critical philosophy was motivated by his belief in the possibility of making metaphysics real science. Vihalemm has also acknowledged Nicholas Maxwell's criticism of standard empiricism as an approach that meets with approval in practical realism. Maxwell is directly calling up for acknowledging metaphysical assumptions in science as necessary for making sense of the progress of science. Practical realism, however, has been initiated as the understanding of science as a practical normative activity that is free of metaphysics. The paper will try to shed some light on these seemingly controversial connections. How could it happen that thinkers who value metaphysics highly made an impact on the birth of an approach that denies any need for metaphysics even in philosophy of science, not to speak about science itself?

Measurement-theoretical view on the evolution of the periodic system of chemical elements

Ave Mets, University of Tartu

Measurement is the procedure of assigning numbers to the material world, hence it is the foundation of the phi-scientific aspect of chemistry, just as of any other phi-scientific discipline. Those numerical assignments became the foundation for building the periodic system of chemical elements. However, this process was not straightforward: assigning numbers was complicated methodologically and metaphysically, leading to different possible systems of the elements on its way. I will analyse some of those purported systems in measurement-theoretical terms: the empirical relational systems, or what exactly are the (purported) objects, and relations thereof, that the assigned numbers and arithmetics pertain to; and the numerical relational system, or what numbers and arithmetic is assigned, and what are its implications for the theoretical and metaphysical interpretations of the studied subject.

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Is the mental special?

Bruno Mölder, University of Tartu

My talk is prompted by a comment Rein Vihalemm made during one of my presentations of the interpretivist conception of the mind. In trying to find out if there are such properties of mental states that would motivate an interpretivist conception of them, I settled on the recognition-dependence. I argued that in order for a state or event count as mental it has to warrant a specification in mental terms. However, mental states do not wear their labels on their sleeves; they do not bear their mental specification essentially. On the contrary, meriting a mental specification is extrinsic – it depends on various extra-mental factors, and interpretation is required to pick out the suitable mental specification. I supposed that this sort of recognition-dependence distinguishes mental properties from the natural properties: whether an object has, say, certain physical properties is not constitutively dependent on interpretation. Vihalemm's comment was that he would not regard the mental as special in this respect, for there are no entities that wear their labels on their sleeves.

My talk is devoted to making sense of this comment, in the context of Vihalemm's own views (Is this a kind of constructivism and was he committed to it?) and in the context of interpretivism (Is there a way to uphold interpretivism only concerning the mind, without generalizing it to all kinds of entities, that is, without becoming a global interpretivist or constructivist?)

Keywords: Interpretivism, constructivism, recognition-dependence

The interconnection between physics and chemistry from the point of view of the philosophy of science.

Alexander Pechenkin, Lomonosov Moscow State University, Vavilov Institute of the History of Science and Technology

According to Rein Vihalemm, physics is a constructivist science which applies the hypothetico-deductive method. Chemistry is a hybrid science which uses both the hypothetico-deductive method and the methodology of natural history.

Here I am turning to the positivistic approach which treats the interscientific relations by referring to the scientific theory as a hypothetico-deductive system. This approach can be traced back to E.Nagel's "The structure of science" (1961). E. Nagel considered the problem of the reduction of the theories by means of the deduction and the formulation of the "rules of correspondence". He provided a reconstruction of the reduction of the phenomenal Boyle law for gases to molecular-kinetic theory. As the rule of correspondence he refers to the statement which connects the absolute temperature of a gas with the average kinetic energy of molecules.

In the philosophy of science there are writings on the structure of quantum chemistry that follow Nagel's approach. Quantum chemistry is treated as a result of the reduction of the chemical theory of molecules to quantum mechanics. Quantum chemistry consists in a number of approximate methods and concepts that arose as a result of this reduction.

As a good example of the reduction of chemistry to physics (more exactly – to the theory of oscillations) one can refer to the theory of the Belousov-Zhabotinsky reaction. As is well known, in 1951 B.P.Belousov discovered the oscillatory reaction of the oxidation of citrus acid by bromate. However, he described his chemical oscillations qualitatively. At the beginning of the 1960s M.Zhabotinsky describes Belousov's reaction on the language of the theory of oscillations. He turned to A. Lotka's differential equations of chemical oscillations (1910, 1920) and developed Lotka's mathematical model by applying the concept of self-oscillations as it was formulated in the Soviet radio-physics. As the rules of correspondence Zhabotinsky used the following assumptions: 1) the oscillations of the solution color are the oscillations of the concentration of the catalyst, 2) the oscillations of the concentration are self-oscillations.

Systems of Practice as Ways of Understanding

Hasok Chang, University of Cambridge, UK

Rein Vihalemm's practical realism crafted notions of truth and reality that are suited to scientific practices. In this paper I want to build on this achievement by adding a hermeneutic dimension to the picture. In line with practical realism, my own accounts of truth and reality are based on the notion of "operational coherence." Intuitively, operational coherence is a matter of what makes sense for us to do, which is about how well our actions serve to satisfy our purposes. It is important to recognize that the success of our actions is not up to us but determined by nature, even though our purposes belong to us and our actions are designed by us. But it is equally important to recognize the hermeneutic dimension here: purpose is something that belongs in the mental realm, as is the assessment of how well our actions satisfy our purposes. A thoughtful actor forms an ideal picture of an activity, or a whole system of practice, that makes sense. In actual situations this ideal picture can rarely be put into practice unaltered, so we do our best by making creative adaptations. If the thoughtful actor is also a willing learner, the ideal picture is modified suitably as an outcome of actual practice. The dialectic between doing and understanding is a process that continues indefinitely. This notion of systems of practice as hermeneutic regimes (or, meaningful ways of life) can be put into practice in various ways. In my work as a historian of science I try to identify various systems of practice in the work of past scientists. Specific systems of practice may be analyst's categories as well as actor's categories. They provide not only ways of identifying the self-understanding of scientists, but ways of providing meaningful interpretations of their work that they themselves did not conceive.

Thinking about expertise and democracy: how studying practices may make a philosopher want to change them

Jaana Eigi, University of Tartu

The aim of the presentation is to discuss normative implications of philosophical analysis of scientific practices by contrasting two arguments about the role of experts in democracy.

Harry Collins and Robert Evans (2002) defend their account as reflecting the preference for a form of life where resolving technical questions is entrusted to persons who know what they are talking about – experts. A crucial element of this form of life is the separation between the technical and the political: experts must not explicitly involve political considerations when dealing with technical issues.

In philosophy of science, the argument from inductive risk states that dealing with the risk of making an error when reasoning on the basis of empirical evidence requires value judgements – for example, to decide which type of error it is more important to avoid. Furthermore, some philosophers suggest that ensuring experts' integrity and credibility requires discussing ethical and political values that are relevant for experts' decisions (see, e.g., Elliott and Richards 2017). Thus, while these philosophers may share Collins and Evans's commitment to the importance of expertise, they reject the separation between the technical and the political – precisely in order to enable experts to fulfil their obligations.

I conclude that the argument from inductive risk shows how studying scientific practices philosophically does not necessarily mean the commitment to preserving them unchanged.

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Keywords: scientific practices, expertise, democracy, normative commitments

Individuating scientific practices: Anscombe and action descriptions

Ovidiu Babeș, University of Bucharest

This presentation aims to sketch a conceptual tool in the analysis of past science. I bear on Anscombe's (1957) 'Intention', and argue that her concepts of foreknowledge, 'swallowing up of intentions', and direction of fit can be useful if applied to the history of science. I illustrate this by an example from seventeenth century optics.

Generally, the 'practice turn' in HPS sees science as a series of activities. Chang (2012, 2014, 2017) has proposed that science is composed of systems of practices, in their turn made up of epistemic activities and operations. All contain their inherent purposes, from which actors may diverge, or may iterate. Chang's views have raised the problem of individuating activities and identifying the inherent aims of scientific practices (Soler, Catinaud, 2014). How can Anscombe help identify and individuate scientific practices? Her idea of foreknowledge (cf. Moran, 2004; Campbell, 2015) is that intentional knowledge is known without observation. Nevertheless, it provides correct descriptions of actions. While each action has its own identifiable intention, chains of actions are possible, and the last link in the chain 'swallows up' the intentions of preceding actions. Also, chains of actions create by-products, diverging actions, of which the agent is aware, even if intention is not present.

I will illustrate this by an episode in the history of optics. Hobbes, Fermat, Roberval and Digby all criticized Descartes' theory of light, along with his law of refraction. However, history presents only some these debates, and focuses solely on the justification of the law of refraction (Sabra 1967; Mahoney, 1973). Applying Anscombe's ideas, we find that each criticism was part of a different practice. For example, Hobbes aimed at defining density and matter resistance, Digby was after an instrument of measuring density, while Fermat questioned the physical grounds of the mathematical account.

Keywords: Anscombe, scientific practices, foreknowledge, optics

Postfactualism as a Descendant of the Pragmatist Theory of Truth?

Sami Pihlström, University of Helsinki

It has been suggested that postmodern relativism may be one of the sources of the irresponsible ways of thinking characterizing our "postfactual" era in which the concept of truth may seem to have lost some of its importance especially in populist politics. This paper will take a look at how the tradition of pragmatism needs to be brought into this discussion, too. I will examine William James's pragmatist account of truth as well as Richard Rorty's more radical neopragmatism from the perspective of the worry that pragmatism might loosen our standards of realism and objectivity in problematic ways. Practical realism, I argue, can be proposed as a critical middle path in the realism discussion.

John Dewey as a Precursor of Rein Vihalemm

Juho Lindholm, University of Tartu

John Dewey anticipated much of the post-Kuhnian philosophy of science. He conceived of science as concrete and practical problem-solving rather than as a set of true propositions or statements: science was a mode of dynamic action done by people rather than a static and abstract system which is considered as independent of scientists. He argued that knowledge is a kind of action; that this identification has already been made in physical science but not in philosophy; that theories and ideas are hypothetical and are not independent of practice because they direct experiment; that all discoveries of science are tentative and instrumental (which does not preclude them from being true); and that the end of science is not the contemplation of eternal and immutable truths but the intelligent and technical regulation of the human environment and society. These ideas were central also for Rein Vihalemm. He does not cite Dewey – he only mentions him once – but his program of practical realism in philosophy of science is in many respects identical to Dewey's later philosophy. I will argue that (1) Vihalemm's project is a special case of Dewey's later philosophy and that (2) in order to convince the logocentric opposition of the validity of Vihalemm's program, Dewey's ideas provide arguments which ground the latter. I will focus on Dewey's epistemology as he presents it in The Quest for Certainty (1929), but the motivation behind it is wider: moral and social philosophy and a reform in education.

Keywords: John Dewey Rein Vihalemm, pragmatism, fallibilism, practical realism

Scaffolding in the scientific theory formation

Kristin Kokkov, University of Tartu

The concept of scaffolding has become more and more prevalent in describing the scientific theory formation. However, this concept is used in different ways and has several meanings depending on the context of use.

For example, John Norton (2014) brings an analogy from architecture and says that the scientific theory is like an arch. Arches are built so that their stones are supported initially by scaffolding. When building a scientific theory, we first proceed inductively with conjectures and hypotheses, supported by fragile wooden scaffolding. When the research is finished and each part becomes self-supporting, the scaffolding is removed.

However, according to William Wimsatt (2014), scaffolding refers to structure-like dynamical interactions between performing individuals. These interactions are means through which other structures or competencies are constructed or acquired by individuals or organizations.

Jeffrey C. Schank (2014) regards models as scaffolds for understanding and says that, unlike a building, which, when constructed, provides its own support, scientific understanding cannot stand on its own and always requires scaffolding to hold it up.

My aim in this talk is to analyse the nature of the concept of 'scaffolding' in the relevant contexts and to point out how these different uses of the concept relate to different aspects of the description of the scientific theory formation.

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Keywords: scaffolding, models, scientific theory formation

Realism, Pluralism and Postmodernism in Quantum Physics: Bohm and Feyerabend

Marij Van Strien, Bergische Universität Wuppertal

In 1952, David Bohm published an alternative interpretation of quantum physics, which, in contrast with the orthodox interpretation, is fully deterministic and in which particles have a well-defined position at all times. Bohm's interpretation found support from Paul Feyerabend, who was a colleague of Bohm in Bristol in 1957-58. Both Bohm and Feyerabend were motivated by a form of realism: they objected against the fact that in the standard interpretation of quantum mechanics, one can only speak of measurement outcomes and there is no complete picture of what happens between measurements. Moreover, both Bohm and Feyerabend connected their interest in alternative interpretations of quantum mechanics to arguments for pluralism in science, arguing that it is generally desirable to try to develop alternatives to established theories. The combination of pluralism and realism meant for Bohm that scientists should never take their theories to be absolutely true but should always try to uncover deeper levels of reality, and in order to do so should try to develop new concepts and ways of thinking.

Bohm's interpretation is often seen as putting quantum mechanics back on solid grounds by offering a realist account of quantum phenomena, and has been used to argue against postmodern uses of quantum physics (e.g. Bricmont, Norris, Beller, Gross and Levitt). Ironically, Bohm himself explicitly argued for the need of a postmodern physics, which includes the idea that there are no objective facts. I argue that this is not simply a case of a thinker deviating from his original thought: Bohm was always committed above all to developing new ways of thinking, and his brand of realism did not exclude that there can be a plurality of approaches and that scientific statements can never be taken as facts. This argument is supported by showing the affinities between Bohm and Feyerabend.

Keywords: Pluralism, realism, interpretations of quantum mechanics, Feyerabend, Bohm

How researchable are social practices? A quick look at the sociological research of lifestyle interventions

Triin Vihalemm, University of Tartu

The concept of social practices is commonly shared – albeit somewhat differently interpreted – in philosophy and social sciences such as anthropology and sociology (Rouse 2007). Assuming that a science is always socially and historically embedded and thereby normative activity (R. Vihalemm 2011), theoretical and empirical analysis of social practices of doing scientific research is crucial in the evaluation of our knowledge of the world (ie climate change or other wicked problems). The activities of doing scientific research are prominent topic in the sociology of science, but the theoretical approach in interpreting the findings are criticized for focusing mainly on textual representations and/or human actors (methodological individualism).

Triin Vihalemm in her presentation will introduce the practice theory based sociological research that has emerged mainly in the environmental sociology and the related subfields such as sociology of everyday consumption and lifestyle politics. The concept of social practices is (re)coined by Theodore Schatzki (1996; 2002) and has its roots in works of sociologists Anthony Giddens, Pierre Bourdieu and philosopher Ludwig Wittgenstein. The conceptual view is shifted away from the single actor seeing the practices as open-ended, spatially and temporally contextualised and hierarchically organized nexuses of doings and sayings that are the basic unit of social processes, a „site of the social" (Schatzki 2002).

The idea of more sustainable social order has been the *raison d'être* of significant part of the empirical research approaching from the theory of social practices. (For example, the research of sustainable interventions, energy and social change led by Elizabeth Shove has been very prominent and also lead to the industrial and public policy changes.) We can say that research of social practices is highly orchestrated by Peirce's pragmatic maxim: the selection of objects and related methods are seeking for certain impact to the sustainability – whatever are its normative criteria.

In the presentation, the methodological possibilities and problems related with the research of lifestyle interventions as openly normative and pragmatic branch of sociological research will be explained with a hope to give some inspiration for investigating the practices related to the real science.

Realism without Truth

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The debate over realism has often centered on the metaphysical and epistemological nature of truth. Realism is typically defined in terms of a correspondence theory of truth and an associated metaphysics concerning the structure of our world. Antirealism rejects this commitment to what some have called a "God's eye view of the world" due to the transcendence problem. Given what appears to be a stalemate in the debate between competing intuitions about the nature of truth, it is natural to try to shift the focus away from truth. Neutralists and deflationist about truth propose two ways to do this. The neutralist view on truth claims that realism can be formulated and defended in terms of truth but without a commitment to any specific theory of truth. The deflationary view on truth sees truth as only playing a role that allows us to express generalizations that we would otherwise not be able to state or as an expressive convenience. I argue that both the neutralist and deflationary views of truth are inadequate for formulating and arguing for realism. This is because both approaches fail to capture the needed degree of mind independence required for realism and fail to account for how our practice of language use contributes to the success of our ordinary and scientific practices. I argue that this critique applies also to Vihalemm's account of practical realism but that practical realism need not reject a correspondence theory of truth.

Keywords: correspondence, deflationism, neutralism, realism, truth, Vihalemm

The Philosophy of Mathematical Practices: The role of Diagrams

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There has recently been a growing interest in the philosophy of mathematical practices. Unlike traditional philosophy of mathematics which usually considers ideal (formal) objects and proofs, the new trend pays attention to what mathematicians 'really' do (Mancosu 2008). An Association for the Philosophy of Mathematical Practice was founded in 2009 to promote this new approach. The present paper is a contribution to this direction: it aims at addressing the specific problem of diagrammatic reasoning in mathematics. Within the traditional (formal) philosophy of mathematics, diagrams were said to play no non-redundant role in proofs. Yet, a practice-based approach to mathematics shows that "real" mathematical proofs are not formal. Hence, diagrams play a role in proving practices where they are used as tools for problem-solving (Giaquinto 2007). However, diagrammatic proofs are said to lack rigor. To overcome this obstacle, we explore the epistemological strategies employed by mathematicians who make use of diagrams as scientific instruments (Moktefi 2017). Thus, we inquire what the practice-based philosophy of mathematics might learn from the philosophy of technology, in particular the philosophy of scientific instrumentation, and we consider the viability of an instrumental realism in mathematics (Ihde 1991).

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Keywords: Scientific practices, philosophy of mathematics, philosophy of technology, diagrammatic reasoning

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