



EGENIS, THE CENTRE FOR THE STUDY OF LIFE SCIENCES



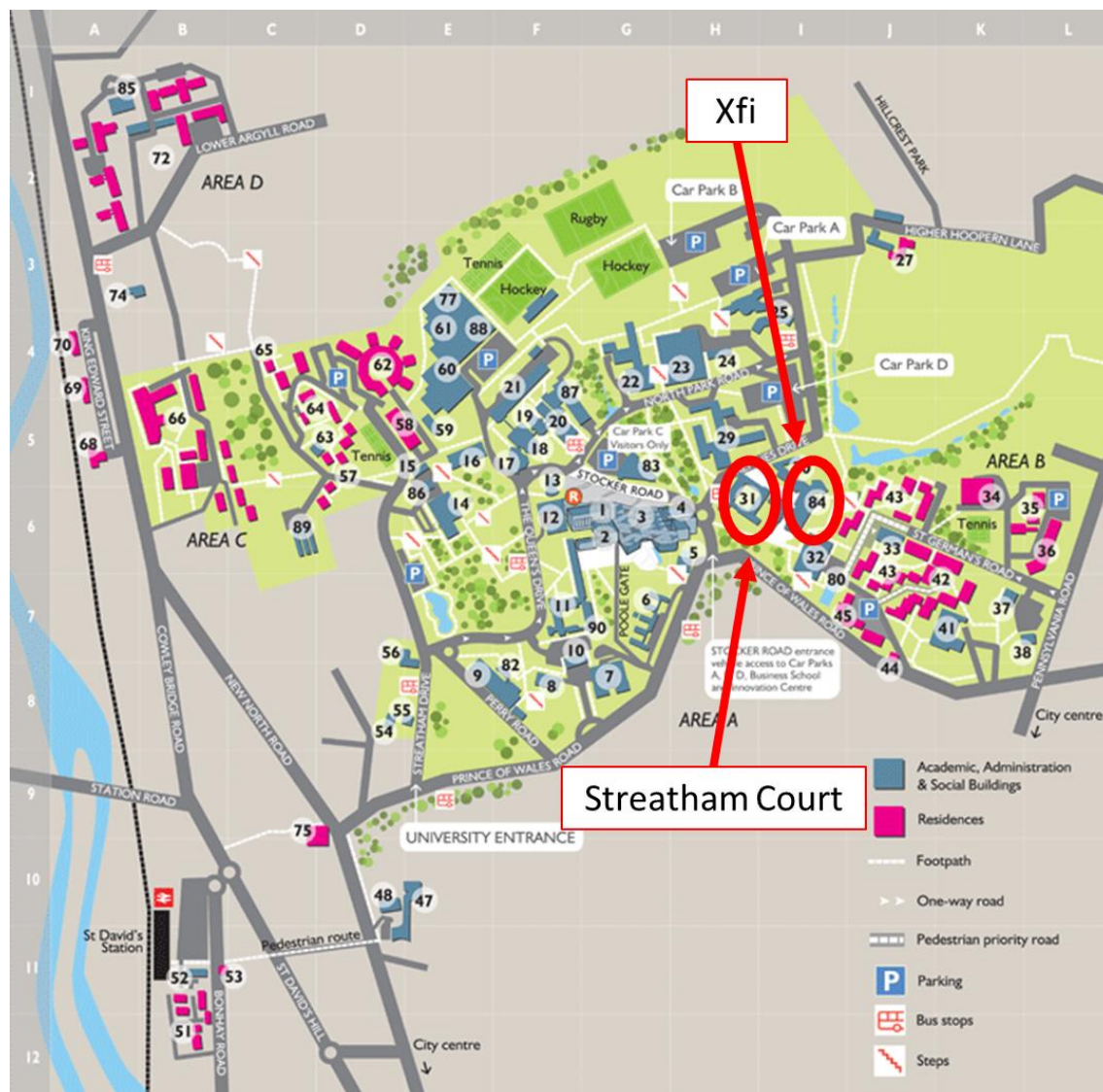
Integrated History and Philosophy of Science Workshop

University of Exeter
June 20 - 21, 2019

Location

The conference will take place in room 0.28, Streatham Court, (building number 31), and the Henderson Lecture Theatre, Xfi, (building number 84):

<http://www.exeter.ac.uk/visit/directions/streathammap/>.



Accommodation

There are various options for accommodation at halls of residences on campus, bookable online through Event Exeter <https://event.exeter.ac.uk/stay>. Dates available from 19th June 2019.

Some options off-campus are:

Premier Inn, St David's, Premier Inn, St David's, Exeter

<http://www.premierinn.com/gb/en/hotels/england/devon/exeter/exeter-central-st-davids.html>

Premier Inn Exeter City Centre

<http://www.premierinn.com/gb/en/hotels/england/devon/exeter/exeter-city-centre.html>

Jurys Inn, Western Way, Exeter <https://www.jurysinns.com/hotels/exeter>

Queens Court Hotel, Bystock Terrace, Exeter <http://www.queenscourt-hotel.co.uk/>

The Clock Tower Hotel, New North Road, Exeter <http://www.clocktowerhotel.co.uk/>

Airbnb <https://www.airbnb.co.uk/>

Workshop organisers

If you have any questions regarding any aspect of the workshop please do not hesitate to contact any of the following:

Ric Sims – rs636@exeter.ac.uk mobile: 07538 779541 (during workshop period)

Adrian Currie – a.currie@exeter.ac.uk

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Grants and Bursaries

We hope to have bursaries available to supplement graduate students with the cost of travel and accommodation. Please contact Kirsten Walsh for further information on k.walsh2@exeter.ac.uk

Provisional Programme

	Session	Henderson lecture theatre, Xfi	Room 0.28 Streatham Court
Thurs 20 June			
11:30 - 12:00	arrival and registration		
12:00 - 13:00	Lunch		
13.00 - 13:30	Session 1	Welcome Sabina Leonelli, Ric Sims	
13:30 - 15:00	Session 2	Values, models and case studies Chair: Javier Suarez Diaz	Pluralism in science and its history Chair: Ric Sims
		Antonis Antoniou - <i>A pragmatic approach to the ontology of scientific models</i>	Erika Szymanski - <i>Singularity and multiplicity in histories of yeast as a research organism</i>
		Karoliina Pulkkinen - <i>Values and the periodic system</i>	Greg Radick - <i>Against monocultures, intellectual and agricultural</i>
		Ana-Maria Cretu and Karim Thebault - <i>Stars and supernovae: real patterns and classifications in the history of astrophysics</i>	Sophie Juliane Veigl - <i>The sociology of scientific pluralism</i>
15:00 - 15:30	Coffee		
15:30 - 17:30	Session 3	Understanding, psychology and (extended) cognition Chair: Giovanna Colombetti	History, values and the genome Chair: Adrian Currie
		Harry Lewanden-Evans - <i>Socially extended scientific understanding</i>	Javier Suarez - <i>The historical roots of the hologenome concept of evolution</i>

		Anna Dadaian - <i>William James and Carl Jung: The 'personal equation' or 'understanding philosophy through psychology'</i>	James Lowe - <i>The values of translation: circuits of comparability in genomics</i>
		Ric Sims - <i>The value of ontological principles: thick systems in the extended cognition debate.</i>	Charles Pence - <i>Reversion and Deep Ancestry in Early Genetics</i>
17:30 - 18:30	Drinks reception		
19:00	Dinner		
Fri 21 June			
09:30 - 10:30	Session 4	Understanding, ethical and aesthetic values Chair: Erman Sozudogru	Pragmatism, prediction and success Chair: Sabina Leonelli
		Milena Ivanova - <i>Beauty, truth and understanding</i>	Omar-el-Mawas - <i>Success is the measure of all things or why arguments from success really favour instrumentalism</i>
		Maria Dede - <i>The importance of moral understanding in bio-medical science</i>	Tom Rosetter - <i>Novel predictive success, textual evidence and scientific realism: the case of late seventeenth-century theories of the earth</i>
10:30 - 11:00	Coffee		
11:00 - 12:00	Session 5	History, values and concepts. Chair: Maria Dede	Pluralism, pragmatism and values Chair: Ana-Maria Cretu
		Adrian Currie - <i>Mourning Neanderthals & Epistemic Value in Archeology</i>	Erman Sozudogru - <i>Pragmatic pluralism: treating the sleeping sickness</i>
		Santiago Arango-Muno - <i>What is memory? The history of the concept and its scientific study.</i>	Ian Kidd - <i>Does pluralism about values enrich the study of epistemic vices in science?</i>
12:00 - 13:00	Lunch		
13:00 – 14:30	Session 6	Panel discussion: Science and Values - an IHPS perspective Karoliina Pulkkinen, Greg Radick, Sabina Leonelli, Hasok Chang, John Dupre. Chair: Adrian Currie	
14:30 - 14:45		Concluding remarks Adrian Currie	

Abstracts of Presentations

Antonis Antoniou – University of Bristol

A pragmatic approach on the ontology of models

During the last decades there has been an ongoing discussion on the ontological status of scientific models, surrounding the following question: What kind of things are models and what is their exact nature? Several answers have been proposed, some of which take models to be real existing abstract objects whereas others suggest that models are nothing but useful fictions which, literally speaking, should be taken as falsehoods. Inevitably, any form of discussion around the ontology of models leads to a number of unfathomable problems regarding the existence (or non-existence) of abstract entities and the nature of their properties. In an attempt to sidestep these problems, French (2010) defends a quietist approach on the ontology of models and theories claiming that answering these metaphysical questions does nothing to explain the features of scientific practice. On the other side, Thomson-Jones (2017) has argued that if what we aim for is to know the truth about the ontology of models and how they are related to the natural phenomena they represent, then bracketing the relevant metaphysical questions, as French does, is not an available option. An account that avoids ontological commitments, not only doesn't lead to the truth about models, but also fails to provide an understanding of what models are.

The purpose of this paper is to defend French's quietism against Thomson-Jones' charge and suggest a methodology for developing a fruitful theory of models based on pragmatic grounds which remains completely neutral to any sort of ontological commitments. First, an argument from French based on the observation that the term 'model' is not sortal will be assessed. The aim of this argument is to support the claim that ontological questions about models are not answerable in the sense that no single unified answer can be given. I will argue that, as it stands, the argument is susceptible to objections and further justification is needed. As a result, an alternative argument is provided for justifying a much stronger claim, namely that ontological questions about the existence and the exact nature of models are unanswerable tout court. The argument is based on a Carnapian approach on metaphysics which refuses to engage with any questions regarding the existence or non-existence of abstract entities and their real nature, classifying them as pseudo-questions. Nonetheless, this does not imply that any reference to terms like abstract objects, properties and mathematical structures is prohibited. Rather, these seemingly metaphysical claims should be seen as an indispensable part of the most appropriate linguistic framework for describing the features of scientific modelling in lack of any alternative and equally efficient way to speak of this practice without engaging the use of abstract terms. In this context, the acceptance of a new kind of abstract entities represented by a certain linguistic framework is a matter of decision and therefore cannot be judged as being either true or false since it is not an assertion.

Thomson-Jones' argument against the bracketing of metaphysics is also examined. The gist of his objection is that if what we aim for is to know the truth about the nature of models and their relationship with the natural world, ontological questions about models need to be clarified otherwise the proposed theories provide no understanding. The criticism to Thomson-Jones is that asking for an

objective absolute truth on matters of the ontology of models and scientific representation is an unrealistic task. The best option is to compromise with the weaker notion of instrumental truth, which is based on pragmatic methods and allows for the bracketing of the inherently unanswerable ontological questions about models.

Pragmatism in this sense is seen as a philosophical method for settling metaphysical disputes which otherwise seem unresolvable. To be a pragmatist is to examine the metaphysical notions that appear in certain contexts and trace the practical consequences of the use of these concepts. If no practical consequences can be found, then all alternative answers are equal and any dispute regarding the real meaning of these concepts and the existence of their referents is idle. A pragmatic approach on the ontology of models is therefore an attempt to arrive at the most appropriate theory of models by providing the necessary conceptual tools in order to grasp as much of scientific talk about models as possible. Such a theory should be seen only as an instrument and not as a definite true answer to the ontology of models. And just like scientific theories, 'the truest' explanation of the ontology of models is the one which works best.

Karoliina Pulkkinen – University of Cambridge

Values and the Periodic System

Usually, philosophical accounts of values in science tend to focus on recent science. This paper offers a distinctly iHPS approach to values by looking how values guided the development of early periodic systems of the chemical elements. In particular, I show that we can make sense of the contrasts between the early periodic systems in terms of chemists' differing emphasis on different values.

The main emphasis of this paper is methodological, though. In order to elucidate the role of values in past science, I argue that our understanding of values needs to be firmly rooted in the concrete historical episode. However, I also argue that philosophers can offer tools for developing more substantial accounts of the values. By zooming into the example of the German chemist Julius Lothar Meyer's systems, I argue we should employ the value of 'carefulness' to account for his approach to systematisations. I will demonstrate the cogency of carefulness as an analytic category by comparing how it fares better than related values of accuracy (Olesko 1995; Pettigrew, 2016) exactness, and precision. The example of Meyer and carefulness shows how history and philosophy of science can collaborate to gain a more thorough understanding of the role of values in science.

Ana-Maria Cretu, Karim Thebault – University of Edinburgh

Stars and supernovae: real patterns and classifications in the history of astrophysics

The *commitment problem* for natural kinds resides in the seeming incompatibility of two desiderata: commitment to mind-independent entities and commitment to practice-relativity. Giving up the former serves to blur the distinction between natural and non-natural kinds. Giving up the latter serves to divorce an account of natural kinds from scientific practice. A novel proposal for *Natural Kinds as Real Patterns* that avoids the commitment problem can be constructed by combining elements of Ladyman and Ross' view on Real Patterns with Laudan's distinction between research

traditions and theories. In this talk we will test the *Natural Kinds as Real Patterns* view against the historical record via two case studies of scientific classification taken from astrophysics. The first case study is the development of stellar classifications from 1880s to 1920s and provides a paradigmatic example of successful classificatory practice built upon the observation of empirical patterns within a research tradition without a theory. The second case study is the evolution of supernovae classifications from the 1940s to the 1990s and illustrates the interplay between empirical patterns and theories in the process of classification revision.

Erika Szymanski – University of Edinburgh

Singularity and multiplicity in histories of yeast as a research organism

Greg Radick – University of Leeds

Against monocultures, intellectual and agricultural

In this talk I'll be examining links between (i) what we might call the "Green Revolution" high-yield agricultural ideal, emphasizing the use of genetically standardized seeds along with the fertilizers, pesticides, irrigation systems etc. with which farmers give those seeds the standardized environments they need; and (ii) what we might call the "start with Mendel" pedagogic ideal in genetics education, emphasizing the use of elementary Mendelian patterns and explanations as foundational for understanding how heredity works, viz. as, in the first instance, down to which "genes for" traits are present and in what forms. Drawing on some recent collaborative work with partners in India, I'll explore the possibility that, in India and perhaps elsewhere, changing from a high-yield to a high-value agricultural system, where the emphasis is instead on indigenous varieties sustainably grown in the regions to which they're adapted, in ways that are good for biodiversity as well as for farmer dignity and income, community building etc., partly depends on giving farmers a scientific education in which gene-environmental interactions are seen not as an extra complication or a nuisance but as fundamental to how heredity works.

Sophie Juliane Veigl – University of Vienna

The sociology of scientific pluralism

Scientific Pluralism has become an increasingly popular term in the philosophy of science and in the philosophy of biology in particular. There are many different versions of this notion, certainly not all of them are compatible. A pluralist claim might be normative, descriptive or both. It is an open question how resonant these claims are with the field they approach. Thus, one might ask: 1) Do specific versions of scientific pluralism provide a useful description of their field of study? 2) Are pluralist aims and goals compatible with the field's aims and goals? Although pluralism bears significant implications for scientific practice and theorizing, these questions are usually not addressed. Thus, the "analysts" of science often forget about their actors.

These actors define and comprise the field the analysts are studying. Researchers are the gatekeepers for both the emergence as well as the decline of plurality. Thus, the role of scientists in this philosophical program should find acknowledgment. To address this issue, a sociology of scientific

pluralism is required. Such a program has several goals, one is to test and feedback on claims philosophers advance about pluralism in the sciences. On the other hand it can inform scientific pluralism with concepts that can only be found through field-work. In this paper, I will demonstrate the promise of such a program with a case study on small RNAs, their inheritance, and their impact on organismal evolution.

I will exemplify how scientific pluralism can be brought from the arm-chair to the bench, and back again. As a first step, I will discuss the phenomenology of small RNA inheritance and propose a pluralist interpretation. Small RNAs are a class of biomolecules that are responsive to environmental stimuli and can transmit this information to subsequent generations. Partly operating through a use/disuse paradigm they present as an instance of Lamarckian inheritance, on the mechanistic level. Therefore, I propose a plurality of theories of inheritance as well as a plurality of explanations for phenotypes. As a second step, I will contrast my claims with the perspective of the core-set of investigators. This survey comprises interviews with the leading small RNA biologists. By discussing my empirical data, I will point to some preliminary results: 1) Philosophical concepts (like “explanation”, or “mechanism”) do not necessarily refer to scientist’s categories. 2) Certain issues and problems of scientific pluralism, raised by scientists, are not included in philosophical discussions. In a third step, I will exemplify how my sociological approach can offer a new perspective on these discussions. I will do this by addressing one much-debated topic amongst scientific pluralists: How do theories relate? Are they alternatives, or are they integratable? I propose that the relevant set of actors decides on how theories are related, and which theories are accepted for constituting plurality. As a consequence, I will introduce an actor-based model for the emergence and decrease of plurality within one scientific field. Thereby I hope to provide a better understanding of the term scientific pluralism and the several ways it configures in research fields.

Harry Lewanden-Evans – University of Durham

Socially Extended Scientific Understanding

Over the past decade, a significant body of work has been developed within epistemology and philosophy of science that examines the nature of scientific understanding, and its relation to the vehicles of scientific inquiry, such as models, explanations, and thought experiments. These analyses of scientific understanding have largely followed traditional accounts of knowledge by primarily focusing on the necessary and/or sufficient conditions required for an individual to possess scientific understanding, whether through the possession of the right kind cognitive abilities, representational states, explanatory information or connections between beliefs. However, this individualism is decidedly at odds with the social dimensions of scientific enquiry. In the era of ‘Big Science’, scientific research is typically spread out over multiple research groups and teams, distributed on a massive scale, and fundamentally collaborative in nature. In this context, no individual researcher has the evidence required to justify particular claims to understanding; instead numerous researchers with specific types and levels of expertise are required to achieve understanding. What does this mean for the concept of scientific understanding? As yet, insufficient attention has been paid to the collective and collaborative nature of scientific research and its implications for our understanding of scientific understanding.

This paper offers a new perspective on scientific understanding by arguing that scientific understanding is fundamentally social in nature. To support this claim, the paper draws on the conceptual framework of extended theories of cognition, and in particular distributed theories of cognition, to provide a theoretical model that captures the social dimensions of scientific understanding. While some scholars have already proposed the application of extended cognition theory to accounts of scientific understanding (e.g. Toon 2015), this work has remained largely limited to the analysis of the use of tools and material artefacts. In contrast, I argue that an adequate account of scientific understanding also needs to accommodate the way in which scientific understanding is socially extended. In order to demonstrate this, I build upon Andrea Woody's (2015) recent work on the function of explanatory discourse in scientific practice and argue that such an account serves to illustrate the way in which a socially extended conception of scientific understanding can accommodate the widely held view that understanding and explanation are closely connected.

This paper challenges a widely held assumption in the current literature on scientific understanding, namely that scientific understanding is adequately analysed at the level of the individual subject. By proposing a socially extended conception of scientific understanding, this paper seeks to shed new light on the social nature of understanding, its relation to scientific explanation, and the collective, collaborative and distributed nature of scientific research.

Anna Dadaian – UCL Centre for Interdisciplinary & Multicultural Inquiry (CMII)

William James and Carl Jung: the 'personal equation' or 'understanding philosophy through psychology'

In this paper, I look at Jung's and James' epistemologies and show that they have certain similarities: while both James and Jung referred to themselves as 'empiricists', in one way or another, they both did not share a key premise of classical empiricism—that sense experience is the primary source of knowledge. In his *Pragmatism*, originally published in 1907, James writes that '[t]he history of philosophy is to a great extent that of a certain clash of human temperaments' (James 1907:6). According to James, '[o]f whatever temperament a professional philosopher is, he tries, when philosophizing, to sink the fact of his temperament'. He then provides a description of two fundamental psychological attitudes, the 'tender-minded' and 'tough-minded' temperaments, where the former corresponds to 'rationalism' and the latter to 'empiricism'. James, however, points out that his choice of these descriptive categories was motivated by the 'ulterior purpose of characterizing pragmatism' (ibid:9). In his *Psychological Types* (1921), I argue, Jung takes up this task of understanding philosophy through psychology and has a motivation similar to James'—namely, to make sense of his own epistemology as a psychologist. I then show that, having criticised James' typology for being 'too broad', Jung himself was striving to provide the 'simple formula' (Jung 1923:397). Finally, I argue that Jung's psychological types help to show that Jung and James only shared the 'logical' aspect of classical empiricism (the preference for *facts* as opposed to *truth*, or induction as opposed to deduction), which Jung calls 'extraverted thinking', whilst refusing to share the other, 'perceptual' component—the preference for 'sensation', as opposed to 'intuition', in Jung's terms.

Ric Sims – University of Exeter (Egenis)

The value of ontological principles: thick systems in the extended cognition debate.

One of the central questions in the extended mind debate concerns what features of the world can or cannot be allowed to be part of a cognitive system. One would expect, then, that the notion of system would be slap bang in the centre of the debate. But the account of Robert Rupert (2009) demotes the importance of systemhood in an explanation of a system's cognitive capacities in that important contributions can come from outside the system. Indeed, he goes further in suggesting that taking such components to be outside the system has the explanatory advantage of a lighter metaphysical commitment. This raises the question of what work systemhood does in the debate and highlights the underlying importance of the appropriate style of explanation for cognitive systems.

This paper argues that the notion of system plays a hidden role in the construction of the canonical arguments in the debate and seeks to cast light on this role. Indeed, I suggest that the notion of system is used in two rather distinct ways in the debate. In the first (system₁) a system is thought of as an arrangement of components with certain fixed properties. The capacities of the system depend on the properties of its components and depend crucially on the way in which they are arranged. This is the manner in which Adams and Aizawa and Rupert seem to use the term. Systems are bottom-up mechanistic enterprises. It does not much matter on this view whether something is part of the system or simply an input to it.

But there is a more nuanced view of system (system₂) which grants that system properties are a result of the properties of its parts and their arrangement but additionally that *the properties of the parts themselves may be constrained or determined by high-level system properties*. This might be closer to Andy Clark's position.

These characterisations, system₁/system₂, I suggest are what Hasok Chang calls ontological principles (Chang, 2009). They are not empirically verifiable, nor are they analytic truths but rather they are principles that make certain epistemic activities intelligible. I suggest that mechanistic explanation is intelligible in a system₁ framework but unintelligible according to system₂. The latter principle seems to call for a new epistemic activity – a new style of explanation.

I argue that 'thicker' system₂ tools are needed for the explanation of cognitive systems and have the potential to break the current impasse in the extended cognition debate.

Javier Suarez – University of Exeter (Egenis)

The historical roots of the hologenome concept of evolution

Symbiosis plays a fundamental role in contemporary biology, as well as in recent thinking in philosophy of biology. The discovery of the importance and universality of symbiotic associations has brought new light to old debates in the field, including issues about the concept of biological individuality. An important aspect of these debates has been the formulation of the hologenome concept of evolution, the notion that holobionts are units of natural selection in evolution. This review examines the philosophical assumptions that underlie recent proposal of the hologenome concept of evolution, and

traces those debates back in time to their historical origins, to the moment when the connection between the topics of symbiosis and biological individuality first caught the attention of biologists. The review is divided in two parts. The first part explores the historical origins of the connection between the notion of symbiosis and the concept of biological individuality, and emphasizes the role of A. de Bary, R. Pound, A. Schneider and C. Merezchkowsky in framing the debate. The second part examines the hologenome concept of evolution and explores four parallelisms between contemporary debates and the debates presented in the first part of the essay, arguing that the different debates raised by the hologenome concept were already present in the literature. I suggest that the novelty of the hologenome concept of evolution lies in the wider appreciation of the importance of symbiosis for maintaining life on Earth as we know it. Finally, I conclude by suggesting the importance of exploring the connections among contemporary biology, philosophy of biology and history of biology in order to gain a better understanding of contemporary biology.

James Lowe – University of Edinburgh

The values of translation: circuits of comparability in genomics

When translation is discussed in relation to genomics, the focus is typically on the extent to which genomic datasets assist in producing actionable knowledge for clinical improvements. The value of translatability in this sense is sometimes accompanied by a conceptualisation of translation in terms of the adding of value to data and other research outputs. To work translationally, one must conduct research with the end of producing outputs that are amenable to having their value amplified or added to. I discuss instead a conception of translation and the amplification of value based on ‘circuits of comparability’.

Starting with genomics research on the pig, *Sus scrofa*, I detail how researchers make use of the more developed data and resources available on the human. The strategies they use to do this involve the development of models of correspondence between the respective genomes of pig and human. These models incorporate networks of inferences between genomes of multiple species that allow data, resources and knowledge to circulate from species to species, usually – though not always – from better to less well-characterised species.

Pig genomics researchers structure inferential relations by means, for example, of the construction and use of comparative maps, and have used these to: identify and make use of particular primers and probes derived from human genomic research; hypothesise the existence and/or function of particular genes; and work out how to appropriately adapt particular methods to pig genomics. Through using and testing these relations, researchers have been able to improve their resolution and accuracy.

I characterise these processes as ‘circuits of comparability’. These circuits enable the accumulation of value for genomic data and resources associated with particular species. The semi-independence of these enable them to accrue value from the wider circuits while allowing them to shape the form that this value takes for community-specific translational purposes.

As well as providing additional conceptual tools for critiquing linear and directional framings of translation, an implication of this is that we cannot adequately capture genomic research by examining species-specific work in isolation. Furthermore, the outcomes and legacy of the human genome project must be expanded to include its infrastructural role in inaugurating the functioning of circuits of comparability, which has helped seed and develop genomics research in multiple species.

Charles H. Pence – Université catholique de Louvain

Reversion and Deep Ancestry in Early Genetics

Biology in the late nineteenth and early twentieth centuries is, by and large, recognizable from a contemporary perspective. This makes all the more interesting those cases in which the practice of biologists in this period seems especially foreign. One such instance concerns the cluster of phenomena surrounding "reversion" and "ancestry." Figures as diverse as Charles Darwin, Francis Galton, W. F. R. Weldon, and Karl Pearson all emphasized the surprising nature of the phenomenon by which organisms would be born with traits that had not been expressed for generations in their lineage. I'll explore what might have been surprising about this phenomenon to these thinkers, unpack some of their thoughts about it, and attempt to analyze the philosophy of biology that could have rendered such cases particularly significant.

Milena Ivanova – University of Cambridge

Beauty, Truth and Understanding

In this paper I explore the epistemic justification of aesthetic values in scientific practice. It is well documented that scientists use aesthetic values in the evaluation and choice of theories they employ. Aesthetic values are not only regarded as leading to practically more convenient theories, but are very often taken to indicate the likelihood of a theory to be true. That is, often scientists place epistemic import on the aesthetic values of theories, deciding whether to commit to a theory in light of its beauty, especially in situation when the empirical data is not available to guide such decisions. The question then arises as to whether beauty can be trusted to be informing our epistemic attitudes towards scientific theories. In this paper I outline some timely defences of the idea that beauty can be a guide to the truth and evaluate whether such defences have been successful. I turn to an alternative explanation for the relevance and importance of beauty in science. I argue that the employment of aesthetic values reflects our own intellectual capacities and provide heuristic guides to achieving understanding.

Maria Dede – University of Exeter (Egenis)

The importance of moral understanding in the bio-medical sciences

Proponents of biomedical moral enhancement (BME) suggest that there is nothing inherently problematic with applying means that developing or future technologies can provide in order to deal with moral evils and even combat global dangers such as climate and terrorism. BME, scholars claim, could be an additional tool that can work within a moral consensus that western pluralist liberal states endorse alongside traditional means of moral enhancement.

In this piece I argue firstly that the above remarks are based on the discourse misinterpreting the way a common understanding of what is morally good has or could be agreed upon. This gives considerable focus on enhancing moral motivation and moral behaviour before or even instead of moral understanding. The place of moral understanding and consensus are not sufficiently explored in BME

literature. Secondly, biological reductionism underlying the biomedical enhancement debate will fail to bring forward or to keep in the spotlight the social factors contributing to the problems BME aims to fix. Biomedical means of moral enhancement applied without a thorough investigation of moral understanding lack the reflexivity traditional means of enhancement bring to morality and therefore can propagate unfair and undesirable power relations. I conclude that biomedical moral enhancement even if BME could assist with moral motivation or moral behaviour it does not give as a way to deal with issues stemming from a lack of a moral consensus.

Omar-el-Mawas – University of Durham

Success is the measure of all things or why arguments from success really favour instrumentalism

The No Miracle Argument (NMA) is a success-based argument for scientific realism. It contends that the best (perhaps only?) explanation of the success of science is that scientific theories are approximately true and their theoretical posits refer. I would like to argue that NMA is just a bad argument based on a misleading metaphor which has been readily accepted by both friends and foes, namely, that “science is successful”. Once the metaphor is removed and replaced by something more literal we begin to notice that the argument is not fit to support realism. Conversely, I will suggest that a practice-based instrumentalist philosophy of science is better supported by arguments from success.

Tom Rosetter – University of Durham

Novel Predictive Success, Textual Evidence, and Scientific Realism: The Case of Late-Seventeenth-Century Theories of the Earth

Since Larry Laudan’s famous 1981 paper, historical cases of false-but-successful theories have been a central focus in the scientific realism debate. Realists have dealt with most of the examples on Laudan’s list by insisting on *novel predictive* success and by adopting various kinds of “selective” realism, arguing that the constituents of false theories which were “responsible” for their novel predictive success are (at least approximately) true and that the false constituents were “idle”. New cases have emerged, however, of false theories which were used to make successful novel predictions in which the false constituents of the theories were – arguably – *not* idle. The purpose of this talk is to introduce a new class of such cases which has not yet received any attention from philosophers. The reason why these cases have not been recognised, I argue, is because the novel predictive successes in question pertain not to the natural world but to ancient texts, and modern scientists and philosophers of science do not value textual evidence. Such evidence, however, was highly valued by early-modern natural philosophers, and the ability of a theory to account for textual phenomena was often seen as just as compelling evidence for the theory as its ability to account for physical phenomena. In some cases, theories were able to accommodate textual phenomena in ways that satisfy contemporary philosophers’ criteria for novel predictive success in that (a) the phenomena were not used in the formulation of the theory and (b) the theory was not modified in any way in order to accommodate the phenomena. In this talk, I introduce two such cases from late-seventeenth-century theories of the earth and consider the implications these cases have for the realism debate.

Adrian Currie – University of Exeter (Egenis)

Mourning Neanderthals and epistemic value in archeology

Philosophers often discuss archaeology as if it were in the business of digging up stuff and then making inferences from that stuff to human things in the past. But some archaeologists talk about their field very differently: archaeology is about understanding the material conditions of human cultural expression. I reckon recent work in HPS is converging on similar ideas – or at least provide a way of translating these ideas in ways I can understand - and suspect that comparing them is a way of expanding our conception of the epistemic and of the value of science. In light of this I'll examine recent work by Mary Stiner on identifying signs of symbolic mourning in the middle Palaeolithic.

Santiago Arango-Muñoz – Universidad de Antioquia

What is memory? History of the concept and its scientific study

Bertrand Russell claimed that “Memory, in some form, is presupposed in almost all other knowledge” (Russell, 1921). But, what is memory? This question has been addressed by many philosophers along the history, but we still don't have a clear answer; that is why some researchers have resorted to psychology and neuroscience in an attempt to answer the question. In this talk, I will first characterize episodic memory and present the two main competing philosophical theories: preservationism and reconstructivism. Then, I will present some psychological and neuroscientific data and analyze how it can shed light on the philosophical debate about what it is to remember.

Erman Sozudogru – UCL (STS)

Pragmatic pluralism: treating the sleeping sickness

Fexinidazole, the first solely oral treatment for sleeping sickness, was approved by the European Medicines agency in November 2018. This drug is a crucial tool in efforts to eliminate sleeping sickness, a neglected tropical disease (NTD) that threatens millions of people in Sub-Saharan Africa. Fexinidazole is the successful outcome of a decade-old partnership between Drugs for Neglected Disease Initiative (DNDi) and Sanofi, which brought together a range of scientific approaches to collaborate in developing a new drug. A closer look at scientific practices in this case shows a great diversity in scientific methods, theories, models and aims. In this paper, I want to make sense of this plurality with respect to the broader context of NTD research.

The sheer diversity of science and the variety of its methods, theories, models and aims etc., has received a lot of attention in recent philosophy of science (see Suppes 1978, Cartwright 1999, Longino 2002, Mitchell 2002, Kellert, Longino, and Waters 2006, Chang 2012). Hasok Chang claimed that the motto of pluralism is ‘in science many things go’ (Chang 2012: 261). In this paper, I take a critical look at this claim and ask: what goes and why? The aim of this question is to interrogate the extent of plurality in scientific inquiry and understand where there might be boundaries of pluralism and how they are formed. In order to do this, I focus on scientific practices in NTD research, investigating the benefits of plurality with respect to the particular aims of different practices. Using the development

of Fexinidazole as an in-depth case-study, I argue for the epistemic and pragmatic benefits of pluralism in scientific practices. Furthermore, I argue that the benefits of pluralism ought to be assessed with respect to particular aims of NTD research and that these aims might impose limits to the extent of plurality. This paper provides an in-depth analysis of pluralism in scientific practices and investigates where limits to greater diversity (in methods, theories, models, aims etc.) might lie. This approach is justified through a set of epistemic, pragmatic, and ethical values. The aim of this paper is to underline the importance of studying scientific inquiries in their broader contexts in order to address philosophical questions. Moreover, by making this link between scientific research on sleeping sickness and the broader context of this disease, I aim to make my philosophy of science approach directly relevant to debates around science policy. In short, the thesis presented in this paper extends the pluralism debate to include policy.

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Does Pluralism about values enrich the study of epistemic vices in science?

There's an interesting difference about the role of values in philosophy of science and vice epistemology. Contemporary philosophy of science is happily embracing axiological pluralism, not least thanks to super work on the historical and life sciences and also by those interested in the value-free ideal. Contemporary vice epistemology, by contrast, is almost exclusively axiologically monistic. It appraises the badness of the vices of the mind only in reference to epistemic values - as, for instance, traits that tend systematically to create bad epistemic effects (such as obstructing enquiry) or that express epistemically bad motives and values (such as a desire to conceal the truth from others). I sketch out a more axiologically pluralistic sort of vice epistemology which finds inspiration from feminist epistemologies of science.

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