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London School of Economics

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Editorial

It's better to know how to learn than to know.

— Dr Seuss

Let's start with a confession. Five months ago I morphed into Editor-in-Chief in a chain of events worthy of Kafka. For five months, I've paced the room like an agitated Wittgenstein, locked in a 'mental cramp' as I tried to pin-down the elusive Form of the Editorial. 'What *is* an Editorial?' I asked, in a futile attempt to determine the set of conditions required for a 'good' Editorial. Bad question. After traversing many leagues, I stumbled on the idea, 'How is the Editorial *used*?' might be more promising. And the answer is simple. The printed journal stands just around the corner. The Editorial offers a moment to reflect on the fact that a remarkable team of talented, hardworking philosophers, for no reason other than their enthusiasm for the subject, produced the thirteenth volume of Britain's national journal for undergraduate philosophy. And that's quite something.

I should begin with a couple of announcements concerning the British Undergraduate Philosophy Society (BUPS). First, BUPS is looking to sign-up to the Society for Women in Philosophy's 'Good Practice Scheme'. This was developed by Jenny Saul and Helen Beebee to improve the representation of women in academic philosophy. There is much work to be done, but I hope that by implementing a series of reforms in our recruitment and review processes, BUPS can contribute to the growing push for equal representation. Second, the accompanying Spring Conference takes place at the University of Southampton on March 21st and 22nd. The Conference offers a unique opportunity to continue the Socratic tradition of corrupting the minds of the young, in what promises to be a lively weekend, packed full of passionate debate and critical discussion. I hope to see you there!

It's not easy to craft an outstanding piece of work amidst the hustle and bustle of undergraduate life. It's not easy to undergo the attitudinal shift from 'I hope this gets a first' to 'I hope this advances the philosophical literature'. The Journal aims to display a selection of the best undergraduate papers from universities in Britain and around the world. And that it certainly does. But this would not be possible without the many undergraduates who took the time to write and submit papers for review. So thanks, and thanks again, to all those who submitted papers. I look forward to reading many more submissions in the coming months. And now onto the acknowledgements. Special thanks go to the philosophy department at the University of Southampton, who have offered generous financial support for our Spring Conference. In addition, the

Mind Association kindly awarded a Minor Conference Grant to support our Autumn Conference at Birkbeck College, London. In addition, many thanks go to the philosophy departments at Birkbeck and the University of Durham for their kind sponsorship.

Farbod Akhlaghi-Ghaffarokh assumed the role of President around the same time that I became Editor. Though we have achieved systematic disagreement on almost every philosophical topic conceivable, we did pull through to select the papers for this edition. Despite substantial philosophical differences, Farbod and I share a commitment to a high standard of clear, cutting philosophical argumentation. Farbod's continued support has made this job a pleasure. And without his strong leadership of BUPS, alongside our embarrassingly long phone-calls, this edition would be nothing like what it is today. Achilleas Sarantaris joined the team for this edition as Commissioning Editor. I know first-hand that this role is difficult, time consuming and – at times – a little unstimulating. But Achilleas co-ordinated the review process with admirable efficiency, displaying nifty organisational skills and a firm command of everything from Foucault to first-order logic. Nathan Oseroff and Bede Hager-Suart once again battled with \LaTeX to produce the Journal's impressively clean-cut formatting. There was much to plough through in a short space of time, so their contribution really has been invaluable.

I must also thank the growing army of manuscript editors: Jamie Parr, James Hart, Joe Herbert, Ella Langham, Dani Marshall, Conor Thompson-Clarke, Torin Greenhill and Andy Bates. The speed and quality of their work really has been exceptional. Last, and most certainly not least, Rajeev Dass has laboured like Sisyphus to co-ordinate the Spring Conference. This is one of the biggest events on the philosophy undergraduate calendar, and Rajeev's cheery enthusiasm alongside top-notch organisation really couldn't be faulted. He single-handedly arranged our catering and accommodation, timetabled speakers around their preferences and maintained active communication with the University of Southampton. Without Rajeev, Farbod and I might just have packed our red-spotted handkerchiefs and joined the circus.

In addition to providing a forum for undergraduate philosophers to share ideas, BUPS also looks to acquaint its members with the wider academic community. Helen Beebe (Manchester) and Mike Otsuka (LSE) kindly agreed to give keynote lectures at the Spring Conference. It's a genuine pleasure to have such distinguished guests agree to share their knowledge and experience. A great deal of thanks also goes to John Worrall (LSE), Samir Okasha (Bristol) and A.C. Grayling (New College of the Humanities), who took time out of their busy schedules to give interviews for this edition. John's interview recounts his long and distinguished career in philosophy of science, from

his early experiences with Karl Popper and Imre Lakatos, to his later work on structural realism and evidence-based medicine. Likewise, Samir discusses his immense contribution to philosophy of biology, expounding his views on evolutionary biology and Dawkins's idea of the 'meme'. Finally, Anthony, who has distinguished himself both as an academic and a humanist, shares his thoughts on bringing the ideas of the great liberal thinkers into the public square.

Last of all, I ought to add a few notes of personal thanks. I trust Farbod is modest enough to cope with two rounds of thanks in the same Editorial. But his considered advice and friendship has been invaluable. Alongside that, my long-suffering friend and consultant anthropologist Matej Križnar has endured so many episodes of BJUP-related existential despair that it would seem rude not to acknowledge the support. And then, brushing over Great Aunt Methuselah and the other Christmas benefactors, we arrive at my parents. Thanks to Dr Julie Keeling for instilling this unrepentant *contra mundi* attitude. And thanks to Martin Keeling for asking me at the age of three, how long it would take a lily that each day grows 50% of the distance between its own edge and that of the pond, to cover the entire pond's surface. The mathematical analysis of 'supertasks' continues to fascinate me.

To wrap up, this edition contains everything from interpretations of probability with respect to natural selection, to a Foucauldian analysis of Marx's alienation. It provides a wonderful insight into the wide-reaching spectrum of undergraduate work in philosophy, with each paper offering a unique and systematic approach to the topic at hand. As such, it gives me great pleasure to welcome you to this thirteenth volume of the *British Journal of Undergraduate Philosophy*.

GK

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A Rebuttal of the Tautology Objection to the Theory of Evolution*

Chloé de Canson

London School of Economics

Introduction

A common creationist objection brought against evolution is that the principle of natural selection (PNS) is a tautology. This was argued, for example, by Gish.¹ In this essay, I will use a discussion of interpretations of probability to argue that this is not the case. In Section One, I will briefly outline Darwin's theory of evolution and the tautology objection. Then, in Section Two, I will show that the tautology objection is untenable. I will begin by arguing that the understanding of fitness used in the tautology objection is mistaken. I will then show that, if a suitable definition of fitness and a particular interpretation of probability, namely the frequency interpretation, is used, the PNS is not a tautology. Finally, I will modify one last time the definition of fitness to take into account a possible objection about the effects of unforeseeable events.

1 Darwin's theory of evolution and the tautology objection

In the first section of this paper, I present the basic claims of Charles Darwin's theory of evolution, and outline the tautology objection to it.

Darwin presented his theory of evolution in *On the Origin of Species*.² His theory consists in two main claims. The first is that there is widespread common ancestry: there is one original species from which all others have evolved. Other biologists before Darwin, such as Jean-Baptiste Lamarck, had held this view. The originality of Darwin came with the introduction of a second claim: that species evolve via the mechanism of natural selection. Natural selection is the claim that the organisms with the traits that confer the greatest advantage

*Delivered at the BJUPS Spring Conference, 21–22 March 2015 at the University of Southampton.

¹Gish [3].

²Darwin [2].

in a given environment are more likely to survive, and thus to pass on these traits to their offspring. This latter claim can be understood as relying on the principle of natural selection (PNS), which is often portrayed in its most basic form as being the claim that, in a given environment, the fittest survive.

The tautology objection to Darwin's theory of evolution claims that one "cannot even define natural selection in non-tautologous terms".³ Indeed, some creationists define the fittest organism in a given environment as the one that survives.⁴ This entails that what the PNS claims is that "the organism which survives has survived",⁵ which is obviously a tautology. This is very problematic. Indeed, tautologies are true regardless of empirical facts, so if the PNS is indeed a tautology, it is compatible with any possible empirical observation. It is therefore completely uninformative: it does not tell us anything about which species actually survive. Furthermore, as Karl Popper argued, statements that make no empirical claims are unfalsifiable, and thus unscientific. This is another serious issue for Darwin's theory which aims at explaining phenomena in biology.

In this first part of the paper, I have explained what two basic claims evolutionists make and what the tautology objection is.

2 Fitness as probability of producing offspring

In this second section, I argue that the equation of fitness with survival, on which the tautology objection relies, is mistaken. I begin by showing that survival is not important in itself for Darwin, and I modify the formulation of the PNS accordingly. The PNS becomes a probabilistic statement. I then discuss several interpretations of probability and argue for the frequency interpretation, and show that under this interpretation the PNS is not a tautology. Finally, I show that since fitness is relative to genes and not organisms, objections about unforeseeable events can be avoided.

³Gish [3] p. 20.

⁴Kitcher [5].

⁵Wilder-Smith [7] p. 127.

2.1 Fitness as a means to reproduction

As Philip Kitcher claims, in Darwinian theory, fitness is not concerned with survival as an end in itself, but with survival as a means to reproduction.⁶ Indeed, from the standpoint of evolution, survival in itself does not matter – reproduction, and thus the passing on of acquired traits, does. If a gazelle has longer legs than others and can thus run faster, what matters from the standpoint of evolution is that it passes on this trait to its offspring so that they will in turn also run faster. It does not matter whether the gazelle dies right after it has reproduced or years later. In light of this consideration, the fittest organism is not the organism most likely to survive but the organism with the greatest propensity to produce offspring. The PNS, which claims that the fittest survive, can therefore be modified to:

PNS₁ If *a* has a greater propensity to produce offspring than *b*, then *a* is more likely to survive than *b*.

This, in turn, can also be modified. Since evolution is concerned with survival only as a means to reproduction, the conclusion of PNS₁ can be adjusted so as to become:

PNS₂ If *a* has a greater propensity to produce offspring than *b*, then *a* will probably produce more offspring than *b*.

2.2 Probability of producing offspring

If probability is understood under the propensity interpretation of probability, the PNS becomes:

PNS₃ If *a* has a greater propensity to produce offspring than *b*, then *a* has a greater propensity to produce offspring than *b*.

As Richard Campbell and Jason Scott Robert remark, this is obviously a tautology.⁷ In this subsection, I will argue that the propensity interpretation of probability is not a suitable interpretation by showing some of its limits. I will then argue that we should instead use the frequency interpretation of probability to reason about evolution. I will conclude that, since the frequency interpretation is the most suited interpretation for this case, and since under that

⁶Kitcher [5].

⁷Campbell and Robert [1].

interpretation the PNS is not a tautology, the tautology objection to Darwin's theory of evolution can be dismissed.

I begin by arguing that the PNS should not be interpreted as PNS_3 , an interpretation based on propensity. Karl Popper is often credited as being among the first to uphold the propensity view.⁸ Propensity is to be understood as a probabilistic disposition, or as Hájek puts it, "a tendency of a given type of physical situation to yield an outcome of a certain type".⁹ The probability of an event should be associated with the setup that produces the outcome, rather than the outcome itself. For example, under the propensity interpretation, 'there is a 1/6 probability that my fair die will yield a 4' means that it is inherent to the die that it has a 1/6 chance of yielding a 4. This interpretation can be contrasted with the frequency interpretation for instance, which would interpret the above claim as meaning: 'if the die is thrown an infinite number of times, the frequency at which it will have yielded the outcome 4 tends towards 1/6'. This interpretation will be discussed later.

A possible way to reject the propensity interpretation for the PNS emerges from the following example. Suppose that there are two machines in a whistle factory, called A and B. On average, machine A produces 5 whistles every minute, whereas machine B produces 10. The probability of a given whistle to have been produced within a given minute by machine B is therefore 2/3. But it makes no sense to talk about the propensity of a whistle to have been made by machine B, as it would amount to talking about the predisposition of the whistle to yield the effect of having been made by machine B. This is a clear reversal of cause and effect. Humphreys was the first to bring up this issue. His argument goes as follows:

The probability calculus implies Bayes's theorem:

$$p(A|B) = p(B|A) \cdot p(A)/p(B)$$

This theorem allows us to reverse a conditional probability, from $p(A|B)$ on the left-hand side to $p(B|A)$ on the right-hand side. But since propensities rely on causation and the causation relation is asymmetric, propensities cannot reverse. This leads to paradoxes of the type described above, called Humphreys' paradoxes. They clearly show that the propensity interpretation of probabil-

⁸Popper [6].

⁹Hájek [4].

ities is unsatisfactory: under that interpretation the Kolmogorov axioms of probability lead to a paradox.

One possible way out of this would be to claim that Humphreys' paradoxes emerge in the case of the whistle factory but not when we talk about evolution. But this is clearly not the case. Suppose that organism *a* has propensity 0.7 and organism *b* has propensity 0.5 to produce offspring. Turning this example into an instance of Humphreys' paradox would require asking a question along the lines of: what propensity a given offspring has of having been produced by *b*? Then, causation (here, reproduction) would be inverted. This is clearly a question which a evolutionary theorist would ask. For example, given two organisms of the same species, *a* and *b*, one can determine what percentage of DNA an organism *c* of the same species shares with *a* and *b*. If *c* shares more DNA with *a* than with *b*, then it is more likely to be a descendant of *a* than of *b*. Under the propensity interpretation of probability, this would read as organism *c*'s having a greater propensity to have been produced by *a* than by *b*, and this is again a clear reversal of cause and effect. Claims about evolution cannot evade Humphreys' paradox. The PNS should not be understood as PNS₃, and we need another interpretation of probability to understand what PNS₂ claims.

I take some time in my analysis to discuss why Humphreys' paradox can be used to reject PNS₃ but not PNS₂. After all, PNS₂ also makes use of the term 'propensity': by claiming that if *a* has a greater propensity to produce offspring than *b*, then *a* will probably produce more offspring than *b*; it defines fitness in terms of propensity. I therefore need to justify the claim that talking about propensity is suitable when defining fitness, but not when making other claims about evolution. The fitness of an organism is dependent upon the relation between that organism, other organisms and the physical environment. For example, a gazelle with very long legs will run faster than other animals in a certain landscape and thus will be fitter. It seems that the fitness of the gazelle is a function of three variables: the length of its legs, the rapidity of other animals and the characteristics of the environment it evolves in. In that sense, its fitness is intrinsic to this situation. It is not an outcome, but rather a characteristic of the relation between these three variables. Using the notion of propensity to describe the fitness of the gazelle thus seems intuitive: fitness is the predisposition it has to produce offspring. Furthermore, using propensity to define fitness does not render fitness susceptible to Humphreys' paradox. For instance, let *a* be fitter than *b*. This translates as '*a* has a greater propensity to produce offspring than *b*'. In order for this to be an instance of the Humphreys' paradox, we would need to consider what the probability is of one organism's being a descendant of *a* versus *b*. But that clearly makes no

sense in this context: fitness, as argued above, is an intrinsic characteristic of the organism and the environment it lives in. The descendants of this organism are not objects of enquiry when we talk about its fitness. So, I have argued, PNS_3 is susceptible to the Humphreys' paradox while PNS_2 is not. The form of both versions of the PNS is: 'if a is fitter than b , then a is more x than b ', x being some characteristic. In the PNS_2 , only the antecedent makes use of propensity, which, as we have just seen, is justifiable. In the PNS_3 , on the other hand, the consequent of the conditional talks about propensity. This cannot be justified, as this consequent refers to the consequences of fitness, which clearly involve offspring.

Thus, I have argued that the propensity interpretation of probability is not suitable for making certain claims about evolution: the conclusion of the PNS_2 should not be taken to mean ' a has greater propensity to produce offspring than b .' In other words, PNS_3 ('if a has a greater propensity to produce offspring than b , then a has a greater propensity to produce offspring than b ') should be rejected as a suitable interpretation of the PNS. If we can find a suitable interpretation of the consequent of PNS_2 which does not involve reference to propensity, then we can conclude that the tautology objection to Darwin's theory of evolution is mistaken.

I argue here that the frequency interpretation is suitable to understand the conclusion of PNS_2 . The frequency interpretation applied to a finite case claims that the probability of an event A in a finite reference class B is the relative frequency of actual occurrences of A within B .¹⁰ For example, under the frequency interpretation, 'there is a 1/6 probability that my fair die will yield a 4' means that the frequency of the outcome 4 in a sequence of tosses of the coin divided by the number of tosses is equal to 1/6. The PNS thus becomes:

PNS₄ If a has a greater propensity to produce offspring than b , then the relative frequency at which a produces offspring is greater than the relative frequency at which b produces offspring.

This is clearly not a tautology. Indeed, whereas the antecedent of the PNS_4 makes a claim about a property inherent to the system (organism and environment), its conclusion makes a claim about the actual number of offspring of the organism. We therefore have a formulation of the PNS which is non-tautologous.

¹⁰Hájek [4].

Not only does understanding the PNS as PNS_4 render it non-tautologous, but it also makes it empirically testable. Indeed, as we have seen, the antecedent, the definition of fitness, is a claim about *inherent* relational properties between the organism at stake, other organisms and the physical environment in which it lives. Consider the claim ‘two plus two equals four’. Just like it is impossible to test empirically claims about the inherent relation between the numbers two, two and four, it is impossible to test the inherent characteristics of fitness. However, it is possible to predict from ‘two plus two equals four’ that, if I put two oranges into a jar which already contains two, I will get a total of four oranges. In the same way, the PNS_4 makes it possible to predict from the fact that a is fitter than b , the fact that a will produce offspring in a higher relative frequency. For instance, consider two wolves, a and b . My hypothesis is that a is fitter than b . I learn that a has produced 10 offspring over two years and b has produced 12 over three years. The relative frequency of a ’s producing offspring is therefore $10/2 = 5$, which is higher than b ’s: $12/3 = 4$. My hypothesis has thus been corroborated.

To sum up, understanding fitness as being about propensity and its consequence to be about relative frequency, that is accepting PNS_4 as an interpretation of PNS_2 , is not only intuitively very appealing, but it also ensures that the PNS is non-tautologous and empirically testable.

2.3 Fitness as relative to genes and not to actual organisms

There is a last modification I want to make to PNS, so as to make it satisfactory. Campbell and Robert give what they argue to be a counterexample to such a formulation of the PNS.¹¹ They ask their reader to consider the case of two wolves which are equally well adapted to their environment. A random event, such as a strike of lightning, removes the mate of one of the wolves, and the chances that it finds a new mate are very low. After the random event, the propensity of the second wolf to leave more offspring is higher. This clashes with our intuitions according to which both wolves are equally fit.

Whereas this is a good counterexample to the formulation of PNS that we arrived to, it does not mean, as Campbell and Robert suggest, that we should abandon our hope of finding an adequate formulation of PNS based on PNS_4 . Indeed, Kitcher proposes that we view the fitness of a given organism in an environment not associated with the reproductive success of that organism,

¹¹Campbell and Robert [1].

but with its *expected* reproductive success based on its genome. As he says, “What is important is the number of offspring an organism with those genes could have been expected to produce.”¹² We can therefore formulate our last version of PNS:

PNS₅ If an organism with the genes *a* has a greater propensity to produce offspring than an organism with the genes *b*, then the relative frequency at which an individual with the genes *a* can be expected to produce offspring is greater than the relative frequency at which an organism with the genes *b* can be expected to produce offspring.

However, an issue arises as we interpret PNS as PNS₅. In PNS₄, the consequent of the conditional was concerned with the *actual* relative frequency of the production of offspring. This is what made it empirically testable. This, in the PNS₅, is no longer the case: what matters is the relative frequency at which an organism with certain genes can be *expected* to produce offspring. This is much less testable than the PNS₄. However, I believe that this is not a good enough reason to outright reject PNS₅. Indeed, that organisms with the genes *a* have a relative frequency of offspring production of the value *x* can be tested, although with less accuracy, in the following way. Consider an organism whose genes are *a*, and a sample of one hundred organisms whose genes differ very little from *a*. Then it can be tested whether organisms with genes *a* can be expected to have a frequency of *x* to produce offspring by looking at the frequency of reproduction of the hundred organisms with genes very close to *a*. Furthermore, Kitcher points out that mathematical population genetics is a subdiscipline of evolutionary biology which gives us detailed mathematical results about the ways in which the distributions of genetic combinations vary in a population, according to the relative fitness of the alleles under consideration. We thus get empirically testable predictions.

To conclude this subsection, the PNS₅ is an adequate formulation of the PNS. Indeed, not only is it non-tautologous and intuitive, it is also based on the fitness of alleles rather than that of organisms *per se*, which enables us to reject counterexamples based on unforeseeable events without impeding its empirical testability.

¹²Kitcher [5].

Conclusion

In this paper, I have argued against the tautology objection to the theory of evolution. In the first section, I have outlined Darwin's theory of evolution and the tautology objection to it. In the second section, I rejected this argument against it. To do so, I began by showing that, in the tautology objection, fitness was considered as an end in itself when it should be understood as a means to reproduction, and I modified the PNS accordingly. Then I discussed some interpretations of probability and I concluded that, if fitness was defined using propensity and the rest of the PNS using relative frequency, the PNS is not only non-tautologous but also empirically testable. Finally, I modified the PNS one last time to take into account unforeseeable events, and I showed that the non-tautological and empirically testable results remained unchanged after this modification.

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Benacerraf's Dilemma and Non-Referential Truth*

Andrew Nevill

University of Southampton

Introduction

It is my contention that two quite distinct kinds of concerns have separately motivated accounts of the nature of mathematical truth: (1) the concern for having a homogeneous semantical theory in which semantics for the propositions of mathematics parallel the semantics for the rest of language, and (2) the concern that the account of mathematical truth mesh with a reasonable epistemology. It will be my general thesis that almost all accounts of the concept of mathematical truth can be identified with serving one or another of these masters at the expense of the other.

— Benacerraf¹

In this passage, taken from 'Mathematical Truth', Benacerraf sets out his criterion for a full account of truth in mathematics. He holds that what must be explained is, first, what makes a mathematical proposition true and, secondly, how we come to have knowledge of such truths. On top of this he calls for a 'homogeneous' theory not giving mathematics a distinct definition of 'True' but linking it to our notion of truth in normal language. Motivating his dilemma, that no account can be given which meets all of these criteria, is Benacerraf's analysis of two possible views of mathematical truth: the 'standard' and the 'combinatorial'. While Benacerraf's argument against the standard view appears plausible, his refutation of the combinatorial account seems to be mistaken. The problem with Benacerraf's dilemma is that he assumes the kind of truth we appeal to in language to be referential. By taking a conventionalist stance on linguistic propositions – by thinking of how some words in our everyday language appear not to be true by reference but rather by convention, I find the dilemma is mistaken – that a combinatorial account could meet Benacerraf's criteria.

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¹Benacerraf [1] p. 404.

1 Truth in the Standard View

Benacerraf first attacks what he believes to be the most common explanation of truth in mathematics – the ‘standard’ account. This view, also called the Platonist view due to its similarity to the idea of platonic forms, holds that numbers are mind-independent objects – that they exist externally in the world regardless of our knowledge of them. The process of gaining knowledge becomes one of discovery to the Platonist; learning a truth (through calculations or proofs) is a matter of finding something out about the world – like, for example, an explorer first setting foot on in new country, who finds a truth about the geography of the world. When explaining mathematical truth in this frame of thought, we would appeal to correspondence – we would say that when we express a truth in mathematics we are expressing a truth about a set of existent objects and the way they are.

Up to here Benacerraf commends the standard view. He finds its semantics – the theory of meaning (or truth conditions) that arise from thinking of numbers in this way – is successful in answering the first criterion of his dilemma. He explains with the following statements:

- (1) ‘There are at least three large cities older than New York.’
- (2) ‘There are at least three perfect numbers greater than 17.’²

While (1) is a statement expressing a truth in the everyday notion – the kind which we may call linguistic, as it relates to our use of words and language – (2) is a mathematical proposition. That is to say, rather than words, (2) deals with numbers. The upside of the standard view, Benacerraf believes, is that we are able to explain what makes each sentence true in the same way. It seems intuitive to say they have the same form: they both pick out several object (cities/numbers) and give a relation between them (*older than/bigger than*). What follows from this is that we could explain the truth of either statement by pointing to the relevant objects and asking whether they do bear this relation. Both are true because there are, existing in the world, at least three large cities older than New York (eg. Boston, London and Berlin) and there are, existing in the world, at least three perfect numbers greater than 17 (eg. 19, 31 and 61). In short both can be called ‘True’ if they correspond to some fact about the world.

The standard account, then, fulfils the first of Benacerraf’s criteria. It is able to

²Ibid. [1] p. 405.

give a single definition of truth for both mathematics and everyday language – that a proposition is true if it corresponds to a fact about the world. However, there is still a second requirement that must be met for us to accept the standard view of mathematical truth. We need to understand how we come to have knowledge of such truths; we need an epistemology. This, according to Benacerraf, cannot be given.

2 Knowledge in the Standard View

... For X to know that S is true requires some causal relation to obtain between X and the referents of the names, predicates and quantifiers of S .³

As Benacerraf claims here, in order for us to have knowledge of something there must be a causal link between the thing and our knowledge of it. How, for example, could we possibly know of events on the other side of the world, having not been there ourselves, if we had not been told of them or affected in some way by them. Without a knock-on chain from the object of our knowledge to ourselves we cannot say we have come about knowledge. This causal theory of knowledge that Benacerraf holds is what gets in the way of the standard view as a complete account of mathematical truth.

Consider the statements from the last section. How might we describe the process of acquiring knowledge of (1) or (2)? In the case of (1) it seems quite simple – we ‘know’ because we can look at each city, measure its size and work out how old it is, and through our perception of the objects we come to have the empirical knowledge that (1) is true. However, while I can look at cities, I can never cast my eyes over a number. In fact, being abstract objects, numbers and other mathematical objects exist entirely outside of our grasp – they are neither spatially nor temporally located. It would be hard to explain how such objects could cause our knowledge. This is Benacerraf’s problem with the standard view. There can be no causal link between something so sharply distinct from us.

Perhaps, though, we could argue that we come to know of mathematical truths another way, maybe through indirect or repeated perception. For example, say I see a magpie sitting on the windowsill; if another joins, then there would be two magpies. I have seen that ‘1 Magpie + 1 Magpie = 2 Magpies’. Surely

³Ibid. [1] p. 412.

if I witness this over and over again, with different objects, I will come to the general rule ‘ $1x + 1x = 2x$ ’. This, it seems, is the closest we can get to perceiving mathematical truths. But then, the knowledge that ‘ $1x + 1x = 2x$ ’ is not what the standard view calls for. Instead, in order to maintain the Platonist view, we would need to claim that our knowledge of this truth is caused by the objects 1 and 2 – objects which we are unable to have causal connection with. In fact, by trying to explain by indirect perception our knowledge of mathematical truths, I find actually we begin to describe numbers in a way that is at odds with the basic premise of the standard view that numbers are objects.

When we consider how the closest we can come to knowing the mathematical truth ‘ $1 + 1 = 2$ ’ is really knowledge that ‘ $1x + 1x = 2x$ ’ (where x is some object), we could be motivated to see numbers, not as objects themselves, but as merely the property of objects. This is an example of Frege’s point in *The Foundations of Arithmetic* that “in language, numbers most commonly appear in adjectival form” – that numbers appear to take the role of a predicate rather than a object.⁴ To take this point further, in normal conversation we don’t presume an adjective refers to an existent object. We don’t say ‘mortality’ refers to a distinct object in the sentence “Socrates is mortal” – so why do we want believe the standard view that numbers refer to objects? We could argue that maybe numbers shouldn’t be treated as existent objects; that Platonists reify numbers – treating something abstract as though it were real. We could be motivated instead to explain mathematical truth as something other than correspondence. Benacerraf considers this in the ‘combinatorial’ account.

3 The Combinatorial View and Benacerraf’s Dilemma

Having found reason to believe that the standard view cannot give a reasonable epistemological account of how we come to have knowledge of mathematical truths, Benacerraf moves to consider the ‘combinatorial’ view. In this account, mathematical truth is a matter of derivation – or provability. This idea stems from looking at numbers not as real, mind-independent objects, but as part of a system which we have invented. As such, someone in search of mathematical truth would no longer be analogous with an explorer discovering truths about the world, instead, perhaps, as a great storyteller – weaving a plot so coherent that we never once question its reality. A mathematical truth is something that fits within the story without affecting its verisimilitude.

⁴Frege [3] p. 27.

Analogies aside, truth in a combinatorial view is not a semantic notion – it does not require referents or interpretation – instead it is entirely syntactic, to do with the grammar (or structure) of the propositions. Take, for example: ‘ $1x + 1x = 2x$ ’. Regardless of what the ‘ x ’ is we would always say that this is a true proposition, we do so because we have as an axiom of our system the assertion that, when an object quantified with ‘1’ is added to an object of the same type also quantified with ‘1’, the resulting group of objects is quantified with ‘2’. We could then go on to define further truths in mathematics by giving proofs: by showing how we are able to derive a proposition, without contradiction, from our set of basic assumptions (our axioms) and the rules we hold mathematics to. To be ‘True’ in the combinatorial view is to be a theorem of our system.

The combinatorialist can easily explain what is it to know a mathematical truth. We don’t need to perceive the external objects that Platonists call ‘numbers’; we need only understand the system of mathematics. I come about knowledge by proving that a proposition is a theorem of the system, by proving it is ‘True’ in the mathematical sense. And so, unlike the standard view, the combinatorial view is able to meet the second criterion for a complete theory of mathematical truth – it is able to give us a ‘reasonable epistemology’ – how we come to know mathematical truths. However, Benacerraf is not satisfied. This combinatorial ‘Truth’ is not what we mean when we talk of truth in everyday language.

Returning, again, to Benacerraf’s statements above: (1), a truth about cities, and (2), a truth about numbers. The standard view gave these sentences the same form, as expressing relations between objects, and as such Benacerraf called the view ‘homogeneous’ as both the linguistic proposition and the mathematical relied on a referential theory of truth (where truth is determined by the objects that either words or numbers refer to). But, if we assume the linguistic proposition is in fact referential, then the combinatorialist would have no choice but to see (1) and (2) as having entirely distinct sorts of truth condition. The theory cannot be homogeneous. With this, Benacerraf imagines his dilemma, there can be no account that is able to explain truth in mathematics as both the same as truth in linguistic propositions and in a way that allows for a suitable understanding of how we come to have knowledge of such truths.

4 Truth by Convention

The necessary route to an account of truth [can only be given] through the subject matter of propositions whose truth is being

defined.⁵

Benacerraf makes a couple of assumptions in formulating his dilemma – he assumes a causal account of knowledge, which leads to his rejection of the standard view; and he assumes, in his argument against the combinatorial view, that ‘Truth’, in the linguistic sense, ought to be referential. The latter is expressed in the above quote: he makes clear that reference is a necessary condition for truth. It is this that I find issue with. What is not considered in ‘Mathematical Truth’ is whether the everyday truths Benacerraf wishes any theory to mesh with are in fact consistent themselves, homogeneous even. To overcome the dilemma we need only show that at least one linguistic proposition is not referential; if it has the same sort of truth conditions as the combinatorial view gives mathematical propositions, then we may find a complete, by Benacerraf’s standards, account of mathematical truth.

(3) ‘2 is the number which follows 1.’

(4) ‘Tuesday is the day that follows Monday.’

Rather than Benacerraf’s examples, (1) and (2), consider (3) and (4) as examples of a linguistic proposition and a mathematical one; (3) expresses a mathematical truth about our use of the number ‘2’, while (4) expresses a truth about the days of the week. (4) ought to exemplify our everyday notion of truth – the notion our mathematical truth must mesh with to meet the first criterion. But, although intuitive, it does not rely on correspondence to be true. Trying to point to the object Tuesday is as difficult as pointing to the object 2. Not all linguistic truth is referential. The days of the week are just as out of our reach, if they are distinct objects, as numbers in the standard account. Clearly they don’t refer to external objects, or if they did we could not have knowledge of them. Perhaps a better way to explain it would be to say that the week – our whole calendar even – is a system we have created. But doesn’t this reflect the combinatorialist view?

To go further, thinking of days of the week in this way may give us motivation to adopt a conventionalist view. Conventionalists, as Carnap puts forward in *The Logical Syntax of Language*, may wish to say that truth in mathematics is merely the contexts in which we have come to describe the use of mathematical symbols as true – their conventional use.⁶ The days of the week seem to fit this exact notion of truth; their truth too relies on the contexts in which we

⁵Benacerraf [1] p. 419.

⁶Carnap [2].

have come to describe their use as true – there is no real reason to say it is Monday except that everyone else believes it is Monday too. A conventionalist theory, then, appears to offer an explanation of truth that could apply to both mathematics and language. It could offer a solution to Benacerraf's dilemma, giving both a homogeneous semantic theory and a reasonable epistemology.

5 Truth Pluralism

Having now looked at Benacerraf's dilemma and one possible solution to the issues he believes he finds in trying to give a full account of truth in mathematics, I feel the need to highlight one further problem for Benacerraf that non-referential truths could bring up: the issue of truth pluralism. Truth Pluralism is the idea that there is no single definition of truth for all subjects – mathematical truth, for example, could be different from linguistic truth, which could be different again from logical truth and so on.

That truth is referential and knowledge is causal are not the only assumptions Benacerraf makes in 'Mathematical Truth'. In calling for a 'homogeneous' theory that can explain truth across multiple disciplines, in language and mathematics, he is asserting the opposite of Truth Pluralism – that there is only one kind of truth. If you consider the two examples I have given of linguistic propositions (1), Benacerraf's, and (4), mine, it appears as though these do not actually have the same semantics. (1) is true by reference to the cities, but (4), as I have said, cannot really refer – Tuesday is just a name we have given a period of time. If we are willing to accept that intuitively everyday propositions can, in fact, differ greatly in how they are 'True', then it seems Benacerraf's dilemma ought not bother us. If there are different kinds of truth in language, why should we care about holding a different kind of truth in mathematics?

Summary

Benacerraf claims that we ought to explain both what 'Truth' means with a single definition across both mathematics and language, as well as how we can know mathematical truths. His dilemma is that no account can meet both criteria. While he seems correct to write off the standard view on the grounds of a failing epistemology, I feel Benacerraf does not consider how some everyday truths do not require referents and so he is quick to drop the combinatorial view despite its potential to overcome the dilemma. A conventionalist theory, a kind of combinatorial view, I find, is able to offer a complete account of truth in accordance with Benacerraf's criteria; however, in arguing for this

view there are some issues raised around truth pluralism. To conclude, Benacerraf's dilemma appears flawed by his assumption that truth must be referential and so even simple truths about days of the week are able to open up his argument to attack from several angles.

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Historical objectivity: virtue or vice? Expounding Nietzsche's theory of 'history for life' in his *Untimely Meditations**

Susan McLean

Durham University

Is life to dominate knowledge and science, or is knowledge to dominate life? Which of these two forces is higher and more decisive?
— Nietzsche¹

In the study of any academic subject, adopting an objective stance and suppressing subjectivity is considered an instinctive necessity. And for good reason: the influence of personal bias can have a multitude of negative effects upon the reliability of epistemological claims, such as eliciting unjust bias and introducing arbitrariness. These dangers are not ones that Nietzsche disputes. Rather, he argues that our method for removing the adverse effects of subjectivity is misplaced and that the project of doing justice to history requires a *lack* of objectivity: history requires servitude to life, a certain kind of approach, and a rare kind of historian. These are undoubtedly radical claims; but it is the method that Nietzsche uses to reach such conclusions that will be focused upon in this essay. By considering the questions posed in the above quotation, Nietzsche takes history as an abstract concept (looking at what it *is* and how it functions) and makes deductive claims about the necessary conditions needed to enable it to fully flourish, deducing that, in order to do justice to the *both* history and life, an impassive and objective stance must be dispensed with. In order to establish Nietzsche's claims, I will detail this deductive process as seen in the second of his *Untimely Meditations* essays, 'On the Uses and Disadvantages of a History for Life', by critically discussing the place of academic history in our lives, demonstrating how and why Nietzsche maps out a vision of history as a collaborative effort, and drawing out the ramifications for historical objectivity.

That 'On the Uses...' is designed to be a polemic on the study of history in a specifically academic sense is explicit from the outset. The very title indi-

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¹[3] §10 p. 121.

cates his intention, which does not use the standard German word for history, *Geschichte*, but the more unusual *Historie*, which “connote[s] historiography, the writing of history as an academic discipline”.² Indeed, that this is an attack on German historiography in particular would have been clear to any of Nietzsche’s contemporaries. Germany at this time was renowned for its excellence in academic history, which was a source of cultural pride, honed to such a degree that it became almost a scientific endeavour (*Wissenschaft*). This distinct kind of impassive and impersonal history is exactly what Nietzsche was railing against. He saw it to be at odds with life and indeed the requirements of history, which (as he impresses upon us in this essay) is vital, passionate and present. Moreover, he saw dry ‘objective’ history – that which is sought for its own sake – to be a drain on the vitality of life, warning that “it is possible to value the study of history to such a degree that life becomes stunted and degenerate”.³

If we are to explicate this claim, we need to start from the beginning of Nietzsche’s line of argument and ask: if history is so dangerous, do we really require history to live? After all, it is not strictly necessary for our survival – an animal is able to exist without a clear notion of time or history. They do not break up the day into hours and minutes, or their lifetimes into months and years, and so they do not have a conception of ‘history’ (beyond their own lived experience). As Nietzsche writes, “[T]he animal lives unhistorically: for it is contained in the present... and at every instant appears wholly as what it is.”⁴ He presents a happy beast able to exist purely in the moment and act without concern. By contrast, man “braces himself against the great and ever greater pressure of what is past”⁵ and at an extreme finds himself lost in a “stream of becoming [so great] he would in the end hardly dare to raise his finger”.⁶ Though there is more hyperbole than realism in these descriptions, the point is nonetheless made: the ability to take action requires that we do not find the past a burden and find ourselves too scared of past consequences to take a step. People are routinely incapacitated by the memory of past endeavours that have gone wrong and the successes that can never hope to be matched again, either those personally experienced or directly witnessed: the

²Bishop [2] p. 93.

³Nietzsche [3] p. 59.

⁴Ibid. p. 61.

⁵Ibid.

⁶Ibid. p. 62.

past can be a heavy burden when we're facing the present and the future. How do we know the bad won't happen again or that the good is capable of being repeated?

The necessity then seems to be that we need a certain lack of historical knowledge to be fully in the present moment and have the proper conditions to enable action. So is living unhistorically the answer to achieving a fulfilled and happy life? Nietzsche claims not; for, as he points out, it is only through an awareness of history did "man become man" in the first place.⁷ In this idea much of philosophy is united: humanity instinctively has a notion of time, as we can see from the way that we split up the days and years into segments of hours and weeks. Many cultures throughout time – entirely independently – have created calendars, the existence of which reflects not only our ability to see patterns in time but our faith that past patterns will continue into the future. Our ability to see patterns in time and have notions of past, present, and future is innate and irrepressible. We simply *do* have an intrinsic notion of time and of the past; it is so naturally a part of our psyche that simply 'forgetting' our history is not within our power.

It should be noted that thus far Nietzsche has not argued directly against the kind of academic history to which he refers in his title. Instead, this is a simple conception of history which is personal (strictly of one's own timeline) and not necessarily cultural, which would be inclusive of other people, events and achievements that exist beyond the remit of our personal experience. Thus the question shifts: is it necessary for us to have an awareness of *cultural* history, of anything beyond our direct experience? Yet again, Nietzsche argues that we do. In order to live life to the fullest, we need to fulfil our potential and do more than merely exist; indeed, we generally wish to achieve great things if that is something of which we are capable. But to have a conception of what it would take to fulfil such potential, we need to know about the past and the great deeds that have been performed before, as a kind of blueprint (or perhaps even as a warning). Thus "every man and every nation requires, in accordance with its goals, energies and needs, a certain kind of knowledge of the past".⁸ As such, we *do* need cultural history. Yet Nietzsche insists that "[f]orgetting is essential to action of any kind" otherwise we find ourselves incapacitated by the weight of past failures.⁹ So how can we both live *with* history and yet

⁷Ibid. p. 64.

⁸Ibid. p. 77.

⁹Ibid. p. 62.

without it?

For Nietzsche, both aspects are of crucial importance and formulate the basis of his proposition that we need both “*the unhistorical and the historical... in equal measure for the health of an individual, of a people and of a culture*”.¹⁰ Nietzsche insists that, in order for history to inspire us to greatness and not overwhelm or incapacitate, we need to approach it properly, using a certain sense of self which is developed first in order to correctly judge and assess when the historical and unhistorical approaches are required. With this in place we can then properly “transform and incorporate into [our]self what is past and foreign”.¹¹ Nietzsche warns that those who don’t possess this power of judgement will react badly to past events, finding themselves either too affected or not affected enough by the past: either “like a man bleeding from a scratch”¹² or, conversely, totally unaffected by the greatest atrocities, attitudes equally damaging to history. Contrary to this, those of the correct disposition will be able to know both when to be historical and unhistorical and how to properly and appropriately view the importance of past events, including how they fit into our lives and into history.

Through this, Nietzsche asserts that our past must be carefully handled – allowed to be present when the historical approach is required and dismissed when action requires being unhistorical. Here, though, it is pertinent to ask whether this disposition is truly contrary to the ‘objective’ history he is criticising? Much like the one that Nietzsche describes, objectivity is a disposition cultivated in order to study history fairly and truthfully; we may not be able to connect emotionally with events if we attempt to remain detached from them, but we can still see their importance and treat them with the gravitas (or lack thereof) they deserve. Indeed, is there still a legitimate claim that history should ‘serve’ life? Does either life or history really need to be subdued in order for the two to be compatible? So far it appears less like the emphasis is on history’s serving or being altered in order to serve man, and more like man is being prescribed the standards needed in order to handle history without injury. Indeed, this knowledge of how to properly employ the historical and unhistorical does not seem to alter history as such, or bend it to life’s will; merely, it seems to be employing history at the appropriate and correct moments in order for it to not interfere with our lives as we intend to live them.

¹⁰Ibid. p. 63.

¹¹Ibid. p. 62.

¹²Ibid.

It does not need to be moulded but merely selectively used. Is this really to make history subservient?

Against this, I must ask whether such a stark distinction legitimately be made between selective employment and active moulding of history. Consider the nature of history. It is not a merely a natural phenomenon (which has evolved via the course of nature) but is in some way artificial, i.e. man-made – both a pattern of cause and effect and a *record* of cause and effect, either simply in memory or in its study. In the creation of the record is a level of interpretation, and if we are choosing when to be historical and unhistorical then we are affecting that interpretation, and what is remembered as history. Strictly speaking, it is not history itself which enables or prevents action but our *understanding* of it, and so it is the record created by man which gives the past any sway over the present or the future – not the events themselves. History, then, is not merely moulded but *created* by man: and thus the very action of remembering or forgetting aspects in order to suit our situation is to change the nature of it. “That which such a nature cannot subdue it knows how to forget; it no longer exists... [a]nd this is universal law: a living thing can be healthy, strong and fruitful only when bounded by a horizon.”¹³

As such, it appears as if to employ this selective approach does limit and thereby alter history, making it subservient to life. However, the difficulty with this approach is that it does not show us how to achieve such a perfect disposition; it simply tells us the importance of having it in order to handle life and history in tandem. Nietzsche gives us no guide to developing such an ability to discern and thus properly employ or alter history. And without it we do both an injury to ourselves and to history, as we can see from the examples above of the men who either bleed at the slightest scratch or are apathetic to the greatest events – not only do both suffer in life, but history itself suffers, as events are either treated too significantly or not significantly enough. This is the advantage of an objective approach to history: it does not require us to take a stance on the moral worth of an event (indeed, it requires us not to). If we retain an academic, historiographical approach to history then our judgement would only need to extend as far as judging when to employ history to inspire our own lives, and dismissing it when we wish to act – we remove the need for personal engagement altogether. Yet, this is not an approach that Nietzsche feels is tenable.

¹³Ibid. p. 63.

As he describes it:

One would think that history would encourage men to be honest – even if honest fools; and hitherto that has indeed been the effect, only it is no longer [since the adoption of historical objectivity]! ... Is a race of eunuchs needed to watch over the great historical world-harem? ... [F]or it seems that the task is to stand guard over history to see that nothing comes out of it except more events, and certainly no real events!¹⁴

This quotation encapsulates Nietzsche's claims about objectivity: that it does not (as it claims) engender truthfulness; that objectivity disables people by detaching them from full engagement with their past; and this then prevents people producing more events and more history – all of which damages both life *and* history.

The problem with objectivity (the deliberate act of removing one's emotional connection to past events) is that it hampers our vitality, which stems from the ability to engage with everyone and everything, to feel involved and personal. The depressed have a detachment from their environment and themselves, a numbness which cuts them off from the outside world and from true engagement with their own emotions: everything is grey, emotionless, empty. At the other extreme are the happy, who are able to live in the moment, attuned both to their inner emotions and their outside environment, and able to personally engage with it all – good and bad. If we conceive of any life lived fully, it is the latter one. Yet, this is incompatible with awareness of events and a detachment of the self from the past, which the objective approach would require of historians in order to be rid of 'subjectivity'. To be involved in this activity, then, is to damage life, to cut out a certain aspect of one's personality. This is clearly expressed through Nietzsche's allusion to the eunuch – like the eunuch, the academic historian has had to, in some sense, cut away a part of themselves. "Are there still human beings, one then asks oneself, or perhaps only thinking-, writing-, and speaking-machines?"¹⁵

In this sense, engagement with objective history does no service to a person's life. Nor indeed does it do justice to history: if the modern man is stunted or even incapacitated by objectivity, then it is not conducive to a greater contribution to history – it simply teaches people to impassively observe and record.

¹⁴Ibid. p. 84.

¹⁵Ibid. p. 85.

In the same way that an excess of history can cause a person to be too scared to act, an excess of an objective stance teaches a person to be passive and thus not create more history. In this way, objectivity does a disservice to history, which is a constantly evolving, enveloping entity extending into the future and thus a living, breathing organism – not a rigid, set object confined to the past. It is composed of human events, both the great and the terrible, and will only continue to live if fed by more. Passivity and apathy not only prevent us from creating more history, but also from properly engaging with the history that has already gone before us. We often appeal to objectivity as an instrument of justice, to distribute a fair judgement on all events. However, to view all events as equally valid or worthy is, as Nietzsche argues, to do the opposite of justice. Justice is not the same as equality; it is the virtue of being able to discern which events have worth and which have less. This is not equality but *discrimination*. Not all people are able to judge appropriately what has been of worth and what has not and this, Nietzsche believed, is the cause of the adopting of objectivity in the first instance. It was not about increasing justice, but *decreasing* the effect of the unjust: “The most terrible sufferings sustained by mankind have proceeded precisely from those possessing the drive to justice but lacking the power of judgement.”¹⁶ Objectivity was therefore designed as a tool to ensure justice – but only serves to remove justice from history altogether.

So how do we put justice back into historical endeavour? Simply reverting back to subjectivity seems to merely open up the study of history to all its pitfalls again; surely we cannot find justice in history if we allow personal bias to shape the narration of events which, as argued above, affects the very essence of history. Nietzsche’s own solution has already been noted. The ‘genuine historian’ is that rare individual who possesses the innate disposition needed to correctly and fruitfully historicise. How one can develop this disposition is never explained, merely its qualities lauded. Such individuals “must possess the power to remind the universally known into something never heard of before”,¹⁷ be of strong disposition as “*history can be borne only by strong personalities, weak ones are utterly extinguished by it*”.¹⁸ Indeed, “such an uncomfortable mission falls only on individuals, and these of the rarest kind.”

¹⁶Ibid. p. 86.

¹⁷Ibid. p. 94.

¹⁸Ibid. p. 86.

“... As judge, [one] must stand higher than he who is to be judged.”¹⁹ So now we are led to ask: do any such individuals even exist? Perhaps they do; and I suggest that Nietzsche implicitly demonstrates that the world possesses at least one. Given that his self-appointed task in *Untimely Meditations* was to provide a new, novel voice by “acting counter to our time and thereby acting on our time and, let us hope, for the benefit of a time to come”,²⁰ it is strongly plausible that the ‘burden’ of being such a historian fell, in his opinion, upon himself.

Even despite Nietzsche’s hint, the ability to discern who are the ‘genuine’ historians seems flighty at best. But this is not truly the point. Nietzsche’s project was always deductive, focused on taking the concept of history and analysing it in order to explicate the necessary and sufficient conditions needed to make it function properly – and, in doing so, created good counterarguments to the common conception that objectivity is a positive and improving feature of any academic discipline. The modern trend has been to increasingly make academic subjects scientific, adopting progressively impassive and ‘removed’ stances in order to decrease personal bias and to epistemologically strengthen claims. This is no misguided endeavour as subjectivity was prone to fault, and so its converse was adopted. But, as Nietzsche’s work highlights, perhaps the solution lay not in demonising subjectivity entirely but seeking out the *right kind* of subjectivity.

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Alienation and Subjectivity in Marx and Foucault*

Jae Hetterley

King's College London

1 The Theory of Alienation

An important precursory consideration to be made about Marxist alienation is that it primarily occurs in Marx's earlier work, such as the Paris Notebooks.¹ As Hunt characterises it in his debate with LeoGrande, on the one hand there is the view (LeoGrande's) that the philosophical moves made in Young Marx – such as alienation – are repudiated and then replaced with the economic and sociological theories characteristic of Marx's post-1845 work; whilst on the other, there is the view that such theoretical distinctions have been overstated, and there is no necessary inconsistency.² As Hunt recognises, Marx still discusses species-essence post-1845 (albeit much less), a concept integral to Marxist alienation.³ As such, this paper will begin from the assumption that there is no great theoretical shift in Marx in order to promote the widest discussion of alienation and the subject, whilst also recognizing that one *could* read Marx as rejecting many of his earlier theories (although I personally don't find this particularly convincing).⁴

What is it to say, then, that the capitalist mode of production is alienating? As Balibar states, we can philosophically trace the notion of alienation in Marx's intellectual development at least to Feuerbach, who argued that religion was alienating: that is to say, people represent the human potentialities for salvation and perfection within supernatural entities when they are actually contained within themselves – as such, we are alienated from human essence and are in need of reappropriating it.⁵ As such, we can posit that persisting alienating forces induce such feelings as 'dispossession' common to the human condi-

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¹Marx [11] pp. 71–98.

²Hunt [10] p. 84.

³Ibid. p. 85.

⁴For further discussion on the 'Young Marx' distinction, see: Althusser [1] and Balibar [3].

⁵Balibar [3] p. 15.

tion.⁶ The movement that Marx makes, however, is to not ground alienation in theoretical and intellectual commitments as Feuerbach does, but rather to focus upon how it arises from everyday social conflicts.⁷ Instead, Marx begins from the role that labour plays in capitalist society, how we labour in order to gain a wage so that we can live, contrasting this with the potentiality for labour to be an expression of one's individuality.⁸ Further, the product of labour is characterised as an *alien object* insofar as, because the worker labours for a wage, and not for the production of the object, and the product of labour is owned by the capitalist, not the worker, the object takes on an independent existence from the worker. In conjunction with this, however, is also the notion of commodification of the worker: in labouring for a wage, the worker becomes an object of the market themselves. Therefore, the conditions for the necessity of labouring – the disjunction of product-ownership between worker and capitalist, and the consequence of the commodification of the worker – leads to alienation under capitalism from three points: (1) alienation of the worker from labour, (2) alienation from the product of labour, and, most importantly, (3) alienation of the worker from themselves, or their 'species-essence'.⁹

Although justified from different points, both Feuerbach and Marx relate alienation, in some form, to human essence, so, it seems as if, something further needs to be said on the matter. The notion of essence is traceable back at least as far as Aristotle, who sees the essence of things as that which defines the thing.¹⁰ Therefore, to say, as Marx does, that capitalism alienates us from our species-essence is to say that we are removed from what it is to be human. For Marx, the defining characteristic of being human is our productivity: where animals, like beavers creating dams, produce solely for their own survival, humanity has the potentiality to transcend this and produce things as a mode of individual expression, or because such things can be beautiful, and so forth. But such activity is impeded under capitalism insofar as the worker doesn't produce for this end, but conjunctively for the capitalist and for their wage.¹¹ In virtue of this, we can now understand why alienation induces such feelings

⁶Ibid.

⁷Ibid. pp. 15–17.

⁸Marx [11] pp. 95–96.

⁹Ibid. pp. 71–72, 73–76.

¹⁰Aristotle [2] VII.4, 1029b.

¹¹Marx [11] pp. 75–76.

of dispossession: through the capitalist mode of production, worker against capitalist, the worker is stripped of what it is to be themselves, of their expression. As commodities on the market, the worker becomes little more than a cog in the larger machine of productive relations. As such, our subjectivity (understood in terms of its ability to express our individuality) is hugely altered by socio-economic conditions, inducing Marx's now famous, "philosophers have only *interpreted* the world in different ways; the point is to *change it*".¹²

2 The Foucauldian Critique of the Subject

Discussion on alienation in Marx seems to naturally lead us onto a discussion concerning subjectivity. How is it that we make the relation between social conditions and the species-essence of humanity? After all, if the worker is alienated under capitalism, then how are we thinking about the worker as an entity here? If humanity has an essence that instantiates following the necessary and sufficient social conditions, then in what sense are we subject *to* social conditions or an object *of* them?

In Marx's view, I think he leans towards the human-entity as subject over object purely insofar as his objection to the commodification of workers implies some transformation from subject to object when existing in the capitalist mode. Further, his picture of communism vaguely outlined in *The German Ideology* seems to imply a vast freedom of choice in life-fulfilling activities, as such, emphasising the autonomy of agents under such a system.¹³ But as Power recognises, in spite of the vast construals of the 'subject' in philosophy more generally, actually pinning down what it is to be a subject is extremely vague.¹⁴ In order to not descend into incomprehensibility or get bogged down in the myriad positions on the matter, let us contrast the paradigmatic conception of the subject – the 'I' of the Cartesian *cogito* – with Foucault's more sceptical view, before turning to how Foucauldian scepticism adversely affects Marx.

¹²Marx [12] p. 118.

¹³Marx & Engels [13].

¹⁴Power [15] p. 55.

2.1 Subjectivity in Marx and Foucault

The philosophical importance of the first two Meditations can't be overstated: we are moved from radical epistemological scepticism to certainty of at least one thing in a matter of paragraphs, and it's wholly to do with the recognition of a subject: even if there is some entity clouding the rest of reality, I can be sure of at least one thing – that there is an 'I' such that that entity is thinking, even if those thoughts are false.¹⁵ And it's this 'I'-ness, this perspective, this intentional mode that forms the basis for an ontology of the subject. The revelation of certainty in the face of doubt isn't what's important here; rather, what's important is that what facilitates that certainty is an entity that takes a position on the world, an 'I' that participates in some active engagement with the world that they are conscious of.

By contrast, the Foucauldian scepticism towards subjectivities isn't motivated from standard epistemological theorising; rather, Foucault recognises a certain *political* aspect to the notion of the subject that firmly entrenches it not as a philosophical discovery, but as a socially contingent construct.¹⁶ What is it that we're talking about when we discuss subjects? More than just some conscious entity, we identify "certain bodies, certain gestures, certain discourses, certain desires" as constituting subjects.¹⁷ For Foucault, power plays a *productive* role in society; i.e.: more than just a State passing laws, or the privileged affecting the lives of the oppressed, power is exercised in the circulation of norms throughout society, and productive in the sense that it 'creates' individuals through inducing them to assent or dissent to the social norms. As such, subjects are the *effects* of power. That is to say, for our notion of a subject to be coherent, we have to accept its contingency and dependency on the power-relations of the time.¹⁸ Were power to have a different set of norms, we must concede that, we would not act in the way we do – indeed, it's not beyond the realms of possibility that we may not have a notion of subjects at all. To return to Descartes, we may be able to posit some 'I', but this 'I' is wholly socially contingent. Here, Butler goes a step further and takes the acts arising from power as both *imitative* and *constitutive* of the social reality, making us properly objects and not subjects, but evaluating the coherence of

¹⁵Descartes [5] pp. 16–20.

¹⁶Foucault [6] p. 98.

¹⁷Ibid.

¹⁸Ibid. pp. 96–98.

this ontological move seems beyond the realm of this paper.¹⁹ Regardless, now that we have a position whereby our notion of the subject is either socially constructed/contingent, or even merely an object, we can see how the Marxist picture may fall down when it begins to appeal to human essences.

2.2 Essences and the Subject

To summarise Marx's position: the capitalist mode of production is an alienating force, ultimately distancing those labouring not just from labour itself and its product, but also from themselves from their species-essence. Essence, as we have derived from Aristotle, refers to the defining characteristics of an entity; as such, alienation distances workers from what it is to be human. A further postulate, that should be under consideration, is that people will be liberated from alienation once the sufficient social conditions instantiate.²⁰

The 'easy' conclusion to make from this, then, is to say that subjects under capitalism are not their 'real' selves; realness instantiates alongside the destruction of alienation. However, to make this inference, to follow in the wake of the Frankfurt School and see capitalism as a form of ideological delusion, to introduce a discourse of 'real' interests²¹ seems vastly problematic, not least because of Foucault's claims of social contingency in subject-creation. To say that we have some real interest or self would imply that there existed some normative moral imperative disconnected from social conditions, and how are we to motivate this? On Foucault's part, such a move is near-impossible: what he ultimately takes from Nietzsche is the idea that philosophical and moral concepts come to be purely out of historical accident and error, mistaking effects for causes, etc.; as such, how are we to derive this *a priori* ethic?²² Furthermore, from his concept of power, we are determined *by* power itself.²³ Again, it doesn't seem as if, under differing social conditions, we would (if we could even derive them, and perhaps only very broadly) have the same interests.

A similar problem seems to follow from the notion of species-essence itself: other than the vague 'what it is to be human', what are we committing to here?

¹⁹Butler [4] p. 519.

²⁰Balibar [3] pp. 15–17.

²¹Geuss [8] pp. 27–28, 12.

²²Foucault [7] pp. 341–342.

²³Foucault [6] p. 98.

Human nature in other political thinkers, paradigmatically Hobbes, is derived in the hypothetical, and isn't sensitive to the potentiality of social circumstance changing it.²⁴ Although Marx is hugely more *a posteriori* in this respect, there is a lingering implication that liberation from alienation implies some persistence of species-essence throughout historical epochs, which again would allow Foucault easy refutation. Therefore, how are we to cash-out Marxism in light of the Foucauldian critiques? In this final section, I will outline a potential way to synthesise Marxism with Foucault, hopefully freeing it of the Frankfurt School's partiality towards normativity.

3 Movements Towards Synthesis

Firstly, I think that the problem of species-essence, dealing as it does with human nature, doesn't provide as huge a departure from Foucault as could be conceived. For example, in his 'Theses on Feuerbach', Marx criticises Feuerbach in his religion-as-alienation analytic from abstracting the notion of human essence and, in its place, affirms that his conception of human essence is derivable purely from the totality of social relations.²⁵ Therefore, in the Marxist theory of alienation, we can posit that alienation under capitalism comes *from* capitalism insofar as it is exploitative. The reference to species-essence runs solely as what can be expressed counterfactually as: if the social conditions were different, then (i) alienation may instantiate or it may not; (ii) species-essence would be different. In virtue of this, there is no ahistorical species-essence; rather, as the totality of social relations it must be contingent. The Foucauldian may be able to dispute the notion of species-essence as a concept outright, either as a product of power or as a historico-philosophical 'accident', and it seems as if this may be legitimate considering the problem of affirming statements about human nature – but this would necessitate a wider genealogy of the concept beyond the scope of this paper. Therefore, conceived as a product of social conditions, species-essence seems largely (if not at all wholly) consistent with Foucault.

The bigger problem seems to come from the concept of the self in the Marxist picture. As explicated, Foucault is openly sceptical about the idea of the subject, and the Frankfurt School's critique of ideology only seems to go further in deepening this divide. Firstly, I think the School's discussion of 'real' interests

²⁴Hobbes [9] pp. 87–89.

²⁵Marx [12] pp. 116–118.

is helpful neither to Foucault nor to Marx. As Wolff recognises, whether it's implicit in his theories or not, Marx was conscious of not aligning himself with a normative critique of capitalism.²⁶ In many ways, Marx does (philosophically) achieve this: alienation is a largely descriptive account of what he sees as a mechanism of capitalism, and his theory of history provides no normative principle from justice or morality as to why we *should* agitate for communism, even if it's there in consciously non-philosophical and overtly political works like the *Manifesto*.²⁷ But discussion of 'real' interests implies some normative stance, to say that there is some 'ought' to human creativity, to how and what we should produce, to the capacities of our production; a line of reasoning which seems to run contrary to an account supposedly providing an explanation of a shared phenomenon. As such, to take the Frankfurt School's interpretation of there being some normative basis in alienation would imply that one would have to posit a huge oversight on Marx's part in order to explain alienation; if in support, this would imply misinterpretation, if against Marx, such a reading is hardly in the spirit of the principle of charity.

So how do we reconceptualise what occurs with the subject in alienation? As we have noted, Marx seems to be in favour of subjectivity, and I will argue that it seems we can allow for this, assuming it's of a relatively mitigated form. In the first place, it seems as if there's no inconsistency to say that, yes, these bodies, discourses, desires, etc., are formed through a circulatory power-structure, with subjectivity as an effect, but that, even if that subjectivity is nothing more than an illusion, it does induce this alienating tendency under our current power-structure. The strict ontology of the subject isn't particularly well developed here, but this seems to be reflective of the paradoxical role it plays: concurrently power-relations are constructing our actions alongside, at least our acceptance of, the illusion that we have some degree of meaningful autonomy – and this illusory degree of autonomy in the sphere of labour seems to be what a Marxist could present as the causal link to alienation. And in returning to the idea at the beginning of alienation as dispossession, such conflicts seem to be indicative of the social phenomena that Marx's theory of alienation is attempting to highlight in terms of alienation for oneself.

²⁶Wolff [16].

²⁷Marx & Engels [14] pp. 191–258.

4 Conclusion

So, what can be said about the Foucauldian critique of the subject in relation to Marxist alienation? Firstly, they don't seem to be as inconsistent as it *prima facie* seems; once we have emphasised species-essence as socially contingent, and not as an ahistorical metaphysical reality, it seems as if we can escape the Frankfurt School reading, which seems to impart a normative ethic not wholly supported by Marx and certainly not by Foucault. In its place, we can legitimately reconceptualise the subject in Marx so that we're not assuming the Cartesian conception, and the historical contingency pervasive in Marx neither seems to endorse this view, even prior to the Foucauldian critique.

What exactly *is* the subject, then? It seems as if the answer to that question is still left unanswered. Does this pose a problem? I'm not so sure. After all, alienation is supposed to emphasise a feeling of dispossession, and Foucault emphasises the contradiction between the activities of power and the potential illusion of autonomy. This illusion of autonomy seems to be at the heart of both Marx and Foucault: for Marx, alienation is induced by the loss of autonomy in the sphere of labour; for Foucault, we have to buy into the illusion of autonomy in our role as an object of power relations. As such, against the consensus, Foucault serves to strengthen Marx, in at least this capacity; against the Frankfurt School's discussion of 'real interests' and liberating the subject. The phenomenal concepts in alienation are indeed emphasised when the divides between objectivity, subjectivity, and autonomy are blurred. Indeed, the conflict of subjectivity and autonomy against objectivity and commodification seems to be what the theory of alienation is seeking to highlight.

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Powerful Modality*

Ben Page

University of Oxford

Introduction

What account of truth-makers for modal statements is best? In this paper I defend a powerful theory of modality, which is rooted within an ontology of powers. This gives a ‘hardcore actualist’ account of modality and I argue that it is superior to the modal realist and platonic approaches. Having contended that this approach should be preferred, I seek to answer some objections one might raise against the account, eventually contending that a combined theist and power account answers the objections most convincingly, whilst also providing some possible responses for those who don’t wish to embrace theism.

It is possible that I won the greatest tennis tournament, Wimbledon, against perhaps the greatest tennis player of all time, Roger Federer – or at least I like to think it is! But what makes this possibility true? Less ambitious modal statements such as, ‘it is possible that I became a bus driver, or went to the shops, or got married’, seem to be possibilities that really do exist. But in virtue of what are they true? In this essay I will provide a theory of modality based on an ontology of powers.¹

1 Truth-making

When I say it is possible that I take a shower, we intuitively think, ‘Yes, that is possible.’ But then the difficult question arises, ‘In virtue of what is this possible?’ Some people might shrug their shoulders and say, it just is. But those of us philosophically minded will demand something more. We want to know what the truth-maker is of the proposition ‘It is possible that I have a shower’. David Armstrong summarises the basic truth-maker theory nicely when he writes:

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¹For the most comprehensive account of a power-/disposition-based modality see: Vetter [41].

The idea of a truth-maker for a particular truth, then, is just some existent, some portion of reality, in virtue of which that truth is true. ... To demand truth-makers for particular truths is to accept a realist theory for these truths. There is something that exists in reality, independent of the proposition in question, which makes the truth true.²

This theory of truth will be assumed for the rest of the paper, as we search for the truth-maker of the possibility that I won Wimbledon.

2 Current Solutions

Current theories of modality employ the use of possible world semantics. This means that when we say it is possible that I won Wimbledon; the thing that makes this true is that there is some possible world in which I win Wimbledon. In using the language of possible worlds we need to ascertain whether there are any ontological implications, or whether we should “regard that language as no more than a convenient *façon de parler*, or as merely a useful heuristic device”.³ There are two popular theories that provide an analysis of what possible worlds actually are. First is David Lewis’s modal realism.⁴ According to this view, there really exist possible worlds in which these possible scenarios play themselves out, which count as the truth-makers of modal statements. Lewis’s theory is categorised as possibilist since it involves possible entities’ existing in the same sense as actual ones. These other worlds exist, for Lewis, and in that sense are real, but the only world that is actual is the world in which we, the observer, find ourselves, with ‘actual’ functioning as an indexical, like ‘here’ and ‘now’. Alvin Plantinga, Robert Adams, and others, hold the second way possible worlds have usually been interpreted – an ersatzist⁵ or platonic approach.⁶ On this view “talk about possible world[s] [is] to talk about sets of propositions”, with a possible world perhaps being thought of as a world-story, “a maximal consistent set[s] of propositions.”⁷ This view, in contrast

²Armstrong [2] p. 116.

³Lowe [22] p. 115.

⁴Lewis [20].

⁵Meaning ‘replacement’ or ‘substitute’.

⁶Adams [1] pp. 211–231.

⁷Ibid. pp. 225.

with Lewis's, is actualist since these propositions, or world-stories, are actually existing propositions within this world.

The theory I will offer will be actualist in flavour but will not rely on abstract platonic propositions or linguistic entities to account for the truth-makers of modal statements. Instead it grounds modality within the 'physical' world. Barbara Vetter categorises these modal theorists as 'hardcore actualists', since "they do away entirely with the appeal to possible worlds".⁸ Possible worlds, on this account, are seen as a mere heuristic device or *façon de parler* that can be used to illustrate modalities. There is more than one 'hardcore actualist' approach in the literature, with some grounding modality in essence,⁹ whilst others ground it in powers. It is the powers account that I wish to explicate and advocate in the remainder of this paper.

3 Powers

Before explaining how powers ground modality, it will be important to understand what powers are. Powers, dispositions, capacities, tendencies¹⁰ have undergone somewhat of a revival within analytic metaphysics.¹¹ Examples perhaps provide the easiest way to grasp what a power is. We say that I have the power to type on my keyboard, that my car has the power to drive at 30mph, that a hammer has the power to shatter a glass and that my front door key has the power to open my front door. Powers point beyond themselves towards their manifestations. Electrons are negatively charged entities, with negative charge repelling other things with negative charge. The negative charge of an electron, therefore, confers the electron with the power to repel other electrons. But more than this, the electron has the power to repel another electron even if it is never in a suitable environment to manifest this power. The power is not real only when the electron is actually repelling another electron, as the ancient Megarians thought, but rather is real even if it never manifests and repels another electron. We might say, as C.B. Martin

⁸Vetter [40] p. 742.

⁹See for example: Fine [12] pp. 1–16, Lowe [23] pp. 23–48.

¹⁰These terms have generally been used interchangeably and so should be thought as synonymous, but I shall keep to the terminology of powers for the remainder of this paper.

¹¹See for example: Mumford [27], Molnar [26], Groff & Greco [13], Marmodoro [24], Jacobs [17].

does, that powers are always in a ‘ready to go’ state.¹² However, when a power meets its stimulus condition, or mutual manifestation partners, it manifests, with its effect occurring, such as one electron’s repelling another. One final thing to be noted is that the manifestation of a power is essential to the power itself. Thus the property negative charge is linked essentially with ‘will repel other things with negative charge’. This means that my account of modality is non-reductive, since there is a level of primitive modality: the essential link of a power to its manifestation. There is much more that could be said regarding the metaphysics of powers; nevertheless, this brief introduction will suffice for our purposes.

4 A Powerful Modality

Supposing that there are powers, how might we ground modality? The basic idea is that objects around us possess certain powers, and these powers ground the possibility of things occurring. The principle could be stated as follows:

A state of affairs *S* is possible iff there is some actual dispositional [powerful] property *D*, which supports a disposition [power] *d*, the manifestation of which is (or includes) *S*.¹³

What makes it the case that something is possible is that an object has a power which, if manifested, would result in that possibility’s being realised. An example will help explain this further. It is possible that I am unable to take my booked flight to Edinburgh to see my girlfriend because of the plane’s breaking down. What grounds this possibility is that one of the components of the plane has the power to break when overused or placed under increased stress, and it may be the case that this power comes into contact with its stimulus condition or mutual manifestation partner and therefore manifests, resulting in the plane breaking down and my flight being cancelled. Or to take another example, what makes it possible that salt dissolve in water is that it has the power to dissolve in water when met by an appropriate stimulus condition or mutual manifestation partner. When a mutual manifestation partner comes into contact with the salt, such as water, the salt will dissolve, but it may never meet this condition and thus never dissolve. Yet the possibility of the salt’s dissolving is grounded, not in another real possible world where it is dissolv-

¹²Martin [25] p. 55.

¹³Borghini & Williams [5] p. 28.

ing, nor an abstract platonic world-story, but rather in the powers that the salt possesses.

How about the possibility that we started with – my winning Wimbledon – what makes this possible? This possibility is grounded in certain powers manifesting or perhaps not manifesting, which would have made it the case that I won Wimbledon. Such things would seem to include my playing the correct amount of tennis at certain times, my muscles' being activated to grow in certain ways at certain times from the correct amount of training, my having good training partners, etc. Note that in this case, these powers would have had to have been chain-like and would have needed to start manifesting a very long time ago, requiring many different powers to manifest themselves in order for this possibility to be realised. It might also be the case that had some powers manifested then this realisation wouldn't have occurred, such as my leg's breaking due to increased stress.

Therefore the possibility of my winning Wimbledon would require a very particular chain, precisely tuned, so that powers manifested or did not manifest at particular times. Equally, however, this chain of powers also almost grounds the heart-breaking possibility that I am denied winning Wimbledon, as in the final I receive an injury in the last game and cannot continue. This example is highly complex and to see how powers ground modality it is easier to start with examples which do not require such long chains into the past, with very many different manifestations happening or not happening at specific times. Nevertheless, once one appreciates how this account grounds more basic possibilities, such as 'it is possible that this salt dissolve', one should be able to see how this account would ground larger more complex possibilities.

One way that may help us better understand this way of grounding possibility is through a branching tree. When a power manifests, it creates a new branch, where new possibilities emerge in virtue of that power's manifesting at a certain time. So we could say that the power *A* not manifesting at time t_1 , means that *X* will happen, but if *A* does manifest at t_1 , then *Y* will happen. If *X* occurs, then at t_2 , if *X* manifests, *Z* will happen; but if *X* does not manifest, *W* will occur. If, on the other hand, *A* did manifest then *Y* happens at t_1 , meaning that at t_2 if *Y* manifests then *B* will occur, but if it doesn't *C* will. The tree becomes more complex when we realise that *A* does not manifest in isolation, but rather many, many, many different things manifest at t_1 , or do not manifest at t_1 , resulting in the amount of possibilities that are realisable being very large. Adopting a theory such as this allows us to remove possible worlds from our ontology, grounding possibility purely in powers, and providing us with a 'hardcore actualist' ontology in which every metaphysical possibility is grounded in this world's objects' powers. Truth-makers to our

modal claims, therefore, are found in the powers of objects in the actual world. John Heil summarises this nicely writing, “Claims about possibility and necessity, modal claims, are made true by the dispositional [powerful] structure of the universe.”¹⁴

5 Why This Account?

Having explicated a powerful modality, why would anyone adopt it rather than embrace the account of Lewis or Plantinga? In this section I will argue that the powers account should be favoured over these two suggestions.

On Lewis’s account, the truth-maker of ‘possibly: I win Wimbledon’ is that there is a real world where I win Wimbledon, although, as it turns out, I don’t actually win Wimbledon. Lewis is well aware that I cannot be in the actual world, this one, and another real world, since that world would then also have to be actual for me, and I would be in two places at once. So who wins Wimbledon? For Lewis, it is my counterpart that wins Wimbledon, which somehow is the truth-maker of my possibly winning Wimbledon. My counterpart, for Lewis, would be something that is as similar to me as possible, and yet it is not me. So there are many different possible worlds on this account, some very similar to this actual world, and some very different. The truth-maker of my possibly winning Wimbledon is that in some similar world my counterpart does win Wimbledon. To make things easier to understand, we might liken what Lewis is saying to a scenario that might occur between identical twins.

It just so happens that within the tennis world there is a pair of identical twin brothers that are the most successful doubles pair of all time: the Bryan brothers, Mike and Bob. Now Lewis’s account seems to me similar to this scenario. Mike and Bob decide they are going to compete for the Wimbledon singles title, Mike proceeds to lose in the first round, whilst Bob goes all the way and wins the title. When Mike asks Bob “Is it really possible that I could have won Wimbledon?”, Bob replies “Yes, my winning Wimbledon provides the truth-maker for your winning Wimbledon since we are pretty much the same.” I have a strong intuition that Mike would find this reply far from comforting. What it seems to come down to is saying that I can take comfort in the fact that someone extremely similar to me has won Wimbledon; but this doesn’t seem to provide a truth-maker for the statement ‘possibly: I win Wimbledon’, since I am not this similar person.

¹⁴Heil [15].

But things seem even worse when we think about my winning Wimbledon, or rather my counterpart's winning Wimbledon. My counterpart is as similar to me as he can be in order to win Wimbledon, but perhaps that just isn't very similar at all. Maybe in order for my counterpart to win Wimbledon the world has to radically change; perhaps everyone else who would beat me becomes injured at the same time and so my counterpart with my DNA actually wins since no one else is in a state to play. Or perhaps my DNA is such that I just am unable to win Wimbledon, and so the closest possible world that my counterpart wins Wimbledon, is one where my counterpart is born from different parents, or is bitten by a radioactive tennis ball (rather than a spider) so that my genetic makeup changes in order that I win the tournament. But even though this counterpart is the closest it can be to me whilst also winning Wimbledon, it doesn't seem that it provides a truth-maker of its being possible that I won Wimbledon. I don't win Wimbledon and it doesn't look like it is possible that I could.

This modal intuition of mine – against the counterpart theory – I take to be pretty strong and for this reason I am not convinced that Lewis's account can provide truth-makers for modal truths such as 'possibly: I win Wimbledon'. However, we have seen, although it would require a long and complex chain – or better, a web – of powers manifesting or not manifesting precisely at certain times throughout my life, and perhaps even before my life, that we can provide a truth-maker for this proposition rooted in the powers of things.

Another reason for accepting my account over Lewis's and the platonic approach is that it is more ontologically parsimonious. Rather than accepting, as Lewis does, that there are many other real worlds, or that there are platonic entities as the platonist account does, one need only postulate this world to account for the truth-makers of modal statements. Only things, 'material' things, are needed to account for the truth-makers of modal statements. David Peroutka puts it succinctly when he writes, "Something is possible if there are active and passive causal capabilities enabling its production."¹⁵ Since this world is a world full of powers it can do the job itself of providing the truth-makers of modal statements.

Perhaps you think there is little reason for accepting one theory of modality over the other. It therefore seems that we need other grounds in order to determine which account we should favour. I happen to think there are strong grounds to believe in an ontology that includes powers, but this paper is not

¹⁵Peroutka [34] p. 204.

the place to present them. Instead I shall contend that one should accept an ontology of powers due to the different range of phenomena powers can help explain.¹⁶ For instance, powers have been used by some to help explain causality. For instance Stephen Mumford and Rani Anjum, in a book-length treatment ‘Getting Causes From Powers’ write, “This gives the simple essence of the dispositional [powerful] theory of causation. Effects are brought about by powers manifesting themselves.”¹⁷ Heil agrees with this sentiment, arguing that “causings are typically mutual manifestings of *many* reciprocal powers”.¹⁸ Another area in which powers have proved useful is in explaining the ontology of laws of nature.¹⁹ George Molnar for instance writes, “Natural laws of a world have as their truthmakers the essential irreducible powers of the objects of that world.”²⁰ Brian Ellis echoes this, claiming that “the truth-makers for the relevant laws of nature are, we hold, just the fundamental dispositional [powerful] properties”.²¹ Further, a theory of powers allows one to revive a theory of natural law in ethics. Anthony Lisska for instance writes, “Moral ‘properties’ are based upon dispositional [powerful] or developmental properties”, and later, “A disposition [power] has, as a part of its very nature a tendency toward a specific end. This end, when realised, contributes to the well-being of the individual.”²² Finally, Stephen Boulter has argued that a power-inspired theory of modality best explains the modality involved within evolutionary explanations.²³ Since parsimony is seen as virtuous in ontology, and since powers seem to be able to do much work in our metaphysics, through flexing their powerful muscles, broader grounds should persuade us to adopt this view of modality.

¹⁶Karen Bennett defends a similar approach to this. See Bennett [3].

¹⁷Mumford & Anjum [28] p. 7.

¹⁸Heil [14] p. 120.

¹⁹I discuss this elsewhere. See Page [33] pp. 114–122.

²⁰Molnar [26] p. 162.

²¹Ellis [9] p. 128.

²²Lisska [21] p. 88, p. 107.

²³Boulter [6] pp. 116–132.

6 Objections

One objection to the account I have given is that powers are already modal and so cannot do the job I have supposed they can. That they are modal can be conceded, and so we should think of this account of modality as non-reductive, which shouldn't be taken as problematic.²⁴

A more serious objection could be given as follows. Consider the thought that this table might not have existed. This seems *prima facie* plausible, namely that the table is a contingent existent. What power of the table makes this claim true? It seems that the answer to this question is that certain powers would have to manifest in order that the table exist. But it is possible that they never manifested, and so it is possible that the table never existed. This seems an adequate response for a table, but things become more troublesome when we think of the world.²⁵ When I think of this world I think that most things in it are contingent entities: things might have failed to exist, this world might have failed to exist. Power theorists can plausibly argue that laws of nature are necessary given the powers in the world.²⁶ And one might accept this, but the laws of nature don't seem necessary in that there couldn't have been different powers instantiated. Neither does it seem that any of the powers should have existed at all. Since I have argued that what ground possibilities are powers that may or may not manifest, it seems we have contingencies all the way down. Thinking of this in terms of a tree, as I suggested above, we are asking what grounds the root from which we start. Some may claim that this is unproblematic, suggesting that this contingency is just a brute fact. Nevertheless, this may not satisfy us. In asking what powers were manifest in order for the world to exist, we might reply that contingency is merely apparent. The powers that start the whole process are just constantly manifesting, and so are necessary. It thus turns out that there are fewer contingencies than we think. Perhaps the particles of particle physics are necessary, and thus there just couldn't have been any different fundamental particles. However, this results in a radically diminished modal landscape.

The need to ground these contingencies in something necessary might cause us to seek another option.²⁷ God, classically conceived, is what grounds all exist-

²⁴Jacobs [16] p. 233.

²⁵Pruss [38] pp. 216–217.

²⁶Oderberg [30] pp. 143–151.

²⁷This seems to be similar to the basis of Aquinas's first way, see: Feser [10] pp. 65–81, Oderberg

tence through being pure actuality, or in our terminology pure powerfulness, and is therefore necessary.²⁸ It can be argued that pure power cannot be anything physical, and therefore the suggestion above regarding physics may fail.²⁹ Therefore, if we want to embrace pure power, something necessary, we should think of God, traditionally conceived, as the ground of these powers. This should not be seen as a postulation, but rather a conclusion based on the need for a pure power to ground all other contingencies. This results in a contingent world and allows for the possibility of other worlds with different powers. However, the problematic element of this suggestion is that we no longer rely on purely physical powers, but also on God, traditionally conceived as pure powerfulness.

This problem seems linked to another, David Lewis's so-called 'alien properties', these being "properties that nothing in this world shares".³⁰ If there are such things as alien properties, what makes them possible? On my account of modality it seems that we are stuck only with the properties or powers of this world. But this won't be able to provide us with Lewis's alien properties. One might argue that there are some things that we think are possible, which just aren't. Perhaps we can alter Walter Ott's advice regarding causation to answer Lewis.

Malebranche and Hume find no difficulty whatever in conceiving of alternative courses of nature; any sublunary event might be followed by any other. It is open to their opponents to argue that they have either misdescribed what they are conceiving or failed to conceive anything at all.³¹

Lewis might think that he can conceive of alien properties but he cannot do so at all. It is the nature of actual powers that determine what there could be, and therefore we can just reject that there are such things as these possible alien properties. This response seems a little heavy handed, and it would be beneficial if we could accommodate alien properties in our account of possibility since there do appear to be some strong examples of alien properties. One might be that there appears to be a gap within the periodic table, element 113

[31].

²⁸Davies [7] pp. 2-9.

²⁹Oderberg [30] pp. 138-143.

³⁰Lewis [20] p. 1.

³¹Ott [32] p. 248.

(ununtrium), whose empirical discovery, at this time of writing, still awaits confirmation. If we suppose it never gets confirmed or created, it still looks like a possible property and yet it would have to be considered an alien property. Another property might be one that makes gravitational forces weaken less rapidly as the distance between masses becomes greater than they actually do. What other ways could we account for such properties?

The Scholastics, who in the Middle Ages systematised a power ontology,³² distinguished between two types of powers, or potencies.³³ Subjective potencies “are grounded in a real subject, rather than merely existing in an object of thought”,³⁴ and objective potencies are merely possible existents, but as merely possible entities do not exist in the actual world.³⁵ So far we have talked more of subjective potencies rather than objective ones. An objective potency, such as a unicorn existing, is really a possible existent, since it contains no contradiction, but nevertheless does not actually exist. It seems we could say that there are actual powers in this world, subjective potencies, which if activated in a chain-like fashion would result in a unicorn. Thus, if we mean by ‘alien properties’ things such as unicorns, then this account can ground the possibilities of these existents.

But there are other properties which are alien, in the sense of non-existent in this world, that cannot be accounted for by merely the powers in this world and I suspect that it is these properties that Lewis’s alien problem is directly concerned with. The problem, in scholastic language, is that the subjective potencies, grounded in things in this actual world, cannot account for all the objective potencies, merely possible entities. Recombinations of this world’s powers may provide us with some objective potencies, but by no means all of them. Put this way, how one answers the previous difficulty, the contingency of this world, will determine what one may be able to say in response to Lewis.

If one adopted a brute fact approach to the previous objection, then perhaps one can reply to Lewis that there may be other brute facts which would ground the possibility of alien properties. The problem with the suggestion is that it seems to remove the ‘hardcore actualist’ nature of the account, since presumably these brute facts are not physical. Further, as I noted above, the brute fact

³²Kenny [18] p. 66.

³³Phillips [35] pp. 182–183, Bittle [4] pp. 60–61.

³⁴Feser [11] p. 39.

³⁵Runggaldier [39] p. 188.

approach does not seem to be a particularly robust answer and so we should try to avoid it. If we adopted the view that the fundamental particles are necessary, as they are always manifesting, then we must take the hard line to Lewis's question, as spelled out above, that there are no – or only a limited number of – alien properties. A different answer, not suggested previously, would be to become a modal realist like Lewis and make a commitment to the existence of possible worlds which are causally or nomologically unlike this world, the actual one, in which these alien properties exist. This again loses one the status of 'hardcore actualism', but seems to solve the problem.

The only other way we seem able to ground these types of properties is by embracing a being that is pure powerfulness: God traditionally conceived. Jonathan Jacobs suggests this writing:

On this view God could bring it about that any number of actually uninstantiated properties are instantiated. The plenitude of possibility would then be grounded in the powers of actually existing objects, including the power of an omnipotent God, to bring about various instantiations of properties, including alien properties.³⁶

A being that is pure powerfulness can instantiate any objective potency when realising the universe, since its power is not limited by anything, including matter. The realised subjective potencies then determine the natural possibilities of the world, and thus powers provide the truth-makers of our worldly modal statements.³⁷ The problematic element of this suggestion is once more that physical powers are not doing all the modal work: God is now also involved. Some will no doubt balk at this suggestion in which case they may adopt a brute fact or restrictedly modal world. However, it should be remembered that we drew God as a conclusion, due to needing something purely powerful to ground contingent powers, and this is what God, traditionally thought of, is. With some current power theorists also arguing that God is required to ground a robust modality, I do not feel lonely in offering this suggestion.³⁸

³⁶Jacobs [16] p. 238.

³⁷For a similar account see: Dvořák [8] pp. 72–83, Pruss [37] and [38].

³⁸Pruss [37] and [38], Leftow [19], O'Connor [29], Jacobs [16].

Conclusion

Powers, then, provide a powerful ‘hardcore actualist’ theory for the truth-makers of modal claims, and do not commit us to postulating other entities to do the job, such as other non-actual worlds, or non-spatiotemporal platonic entities. I have suggested some responses that a power theorist might make when countering objections to this view, advocating that the combined theist and power account answers the objections most thoroughly whilst also providing some suggested responses for non-theists. Given all this I take it that powers are able to provide us with a powerful theory of modality.³⁹

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³⁹The author wishes to express his thanks to Sophie Allen for the valuable feedback on earlier drafts of the paper.

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Interview: A.C. Grayling

New College of the Humanities

When did you realise that you wanted to become a philosopher?

At the age of 12 I read Plato's *Charmides* and was hooked. I then read G.H. Lewes's *Biographical History of Philosophy* which went from Thales to Comte; then Russell's *History of Western Philosophy*, which was more up to date in the final sections; and loved it all. So I knew from quite early on what I wanted to do.



What is it that philosophers do?

Philosophers examine ideas and arguments; try to make sense of difficult problems about reality, knowledge, value and reason; debate with each other about the nature and application of fundamental concepts; think about thinking; dig up and inspect the assumptions and beliefs that shape world-views; examine claims about what is real and right; discuss political ideas; critically evaluate the methods and concepts used in the natural and social sciences.

Alongside figures such as Dennett, Dawkins and Hitchens, you have played a key role in the New Atheism movement.

How important is it for philosophers to bring the liberal principles of figures like J.S. Mill and Thomas Paine into the public square?

In my view, very important. A rational, open-minded and critical approach to belief systems, ideologies, and conventional moralities is key to the enlargement of knowledge, to social progress, and to tolerance. Human minds have been dominated by narrow and superstitious belief systems for most of history; liberation from them has been the source of scientific and political progress in the last 400 years. We need to keep on opening eyes, minds, and hearts to a free and sensible view of things.

In your view, where does philosophy stand in relation to the natural sciences?

The tradition of analytic philosophy is very close to the natural sciences in that the results and the methodology of science are respected and taken very seriously, though philosophy also thinks carefully about all those concepts and methods too. Science came out of philosophy, and at its frontiers confronts philosophical problems again.

If you could take three works of philosophy with you to a desert island, what would they be and why?

Hume's *A Treatise of Human Nature*, Kant's *Critique of Pure Reason*, and the Kneales' *Development of Modern Logic*. The reason is that I want to study aspects of all three in more detail, but they would also be useful as resource for a project I'm working on concerning the scope of conceptualisation and its constraining effect on theory construction.

What would be your advice to undergraduates looking to break into academic philosophy?

Undergraduates who would like to go on to devote their lives to the study and teaching of philosophy need to undertake postgraduate study and doctoral research, accept that they are in a very competitive field which might take several years of part-time jobs before something more permanent offers, during which they must do the key thing: publish! – but it is a great life, a rewarding one – in which there are many riches other than money!

The BJUP team is extremely grateful to Professor Grayling, philosopher, author and Master of the New College of the Humanities, for taking the time to answer our questions.

Interview: Samir Okasha

University of Bristol

What is philosophy of science?

Difficult to give a succinct yet still informative answer, but here goes. Traditional philosophy of science is largely concerned with methodological matters, e.g. about how scientific inference works, how theories can be tested, whether empirical data can always discriminate between rival theories, what the nature of scientific explanation is, and more. In addition to these sorts of questions, in the last 30 or 40 years philosophers of science have increasingly concerned themselves with foundational issues in particular sciences,



especially physics, psychology and biology. Classic issues of this sort include the measurement problem in quantum mechanics, the nature of biological species, and the nature of consciousness. These issues are discussed by the scientists themselves, of course; however, many philosophers of science, including myself, believe that philosophy has an important role to play in the discussion, so long as it is suitably informed by the relevant science.

What was your first exposure to philosophy of science; how did things progress from there?

I first took a philosophy of science course while an undergraduate at Oxford, and then pursued the subject further at graduate level, also at Oxford. At first I was torn between focusing on philosophy of science and mainstream analytic philosophy, but eventually became increasingly taken with the former. However, I do still have broad philosophical interests and try to keep abreast of discussions in other areas of philosophy. Two teachers who particularly inspired me at Oxford were Bill Newton-Smith (now retired) and Alex Rosenberg (now at Duke University).

What are you working on at the moment?

At the moment my energies are focused on a research project entitled ‘Dar-

winism and the Theory of Rational Choice', funded by a European Research Council Advanced Grant. The project studies the connections – formal and thematic – between Darwinian evolutionary theory and rational choice theory, from an overarching philosophical perspective.

How is current research in biology impacted by philosophy of science?

Well, the vast bulk of day-to-day research in biology is not directly impacted by philosophy of science, at least in the short term. However, the area of evolutionary biology has always been a fertile ground for interaction between philosophy and biology, and this continues to be true today. I have been pleased, and surprised, to find some of my own work on the 'levels of selection' question being taken up and discussed in the biological literature, and there are many other examples of this. The emerging field of synthetic biology is also an area where philosophers of science have interacted fruitfully with biological practitioners.

In his 'Letter to the Director of the LSE', Lakatos argued that philosophy of science stands at the intersection between philosophy, scientific method, history, logic and the sciences. He argued that it is important to be competent in all of these disciplines before tackling philosophy of science.

What are your thoughts on this?

I basically agree, though with caveats. Certainly much of the best research in philosophy of science is done by people who are conversant with philosophy, logic and one or more of the sciences, and who have often spent many years acquiring these competencies, often with a significant amount of self-study. However, I think it is perfectly possible, and indeed beneficial, to begin the study of philosophy of science early in an undergraduate career. Thus at Bristol, I regularly teach introductory philosophy of science to first-year science students and first-year philosophy students; both groups enjoy it and find it valuable. So I don't think that philosophy of science should only be taught to people who already know a lot of philosophy and science. For many of the basic ideas are readily grasped and worth being exposed to at an early stage in one's education.

Where do you think traditional areas of philosophy, such as philosophy of language and philosophy of mind, stand in light of the expansion of experimental fields such as evolutionary linguistics and cognitive science?

A big issue and one I don't have a strong view on. Certainly, linguistics and cognitive science have had an enormous impact on philosophy of language and mind respectively, and this is surely a positive development. However, I think there are certain issues in traditional philosophy of mind/language

that the empirical disciplines don't bear on directly; so traditional 'a priori' philosophising still has a role to play.

What advice would you give to students looking to break into philosophy of science?

Immerse yourself in the relevant science; acquire the necessary technical skills; don't lose sight of the broader philosophical questions; choose a topic to work on carefully; think for yourself; don't assume that just because there is a large philosophical literature on a topic, that the topic is necessarily a good one.

Popular author Sam Harris used experimental evidence from neuroscience (e.g. Libet, Soon) to argue against free will. Dan Dennett responded by criticising Harris's dismissive treatment of compatibilism.

Do you think philosophers of science have an obligation to criticise bad science communication on issues of social importance?

Well, 'obligation' is perhaps putting it a bit strongly, but I do think it's a potentially useful thing for philosophers of science to do.

Do you think evolutionary psychology is a science? If yes, why so? If not, how might evolutionary psychologists make their work more scientific?

Yes, I do think that evolutionary psychology is a science. The basic idea that humans' psychological dispositions have evolved by natural selection strikes me as very plausible, though of course cultural and environmental influences obviously affect human behaviour too. I think that many of the critiques of evolutionary psychology, including by philosophers, have been a bit over-the-top. Yes, there has been some questionable research done under the evolutionary psychology banner, but that is no reason to dismiss the whole approach.

Richard Dawkins introduced the concept of the 'meme' in *The Selfish Gene*. Do you think that memes are a helpful tool for analysing human culture and cultural transmission?

Well, I think that the 'meme' notion is interesting, but hasn't led to much serious science. (I don't think Dawkins would disagree.) But other versions of cultural evolutionary theory, which do not use the 'meme' concept, have led to real insight and spawned significant empirical work. I am thinking in particular of the work of Rob Boyd, Pete Richerson and their collaborators. Boyd and Richerson's book *Not by Genes Alone* is a good introduction to this area.

The BJUP team is extremely grateful to Professor Okasha for taking the time to answer our questions in such detail.

Interview: John Worrall

London School of Economics

What was your first exposure to philosophy of science; where did things go from there?

So there I was at my North-of-England Grammar School in 1963/4, deciding at the last minute to reverse the plan to go into the ‘Scholarship Stream’ to apply for Oxbridge. (Think *The History Boys* – it then meant an additional year in the Sixth Form, and so another year in Leigh and I just couldn’t face that!) This produced a last minute rush to decide where to apply for entry the following September. I received 15 minutes of careers advice – all I ever got. The outcome was that I should (a) study something involving maths, since that was my favourite subject; (b) aim for a course that might make me rich (my only input into the careers session); and therefore (c) go to the LSE to study mathematical statistics, with a view to being an actuary. (Actuaries apparently having, at any rate then, the highest average salary of all professionals.) So I applied to the LSE for stats, without knowing the first thing about what actuaries do.



I had one optional course in my first year at LSE, and I chose Alan Musgrave’s ‘Introduction to Logic’. The timetable for this course had an optional lecture series – Karl Popper’s ‘Problems of Philosophy’. Since Popper’s lectures didn’t help you do proofs in first-order predicate logic and were in all respects irrelevant to the logic exam, most of my fellow logic students soon dropped them. But I was hooked. First of all they were pretty good theatre: David Miller – his then Research Assistant – would arrive first and write “NO SMOKING” in big capitals on the board. Students – and lecturers – often smoked during lectures in those days, but Popper believed he was allergic to tobacco smoke. Then all the other academics in the Department (all four of them!) would troop in and sit at the front, and finally the great (but tiny!) man arrived. Whatever history may decide, there was no doubt that Popper, in his own quiet way, really believed himself to be a major philosopher. He had, after all, ‘solved the problem of induction’ – and

this came across strongly in his lectures.

He was also a shameless name-dropper. There was much talk of correspondence with Einstein and conversations with the great logician Alfred Tarski on various park benches in Vienna. This was heady stuff for an 18-year-old working-class lad. I bought, and devoured, *Conjectures and Refutations* and *The Logic of Scientific Discovery*. And, although I had been perfectly happy mastering chi-squared tests and the like, I enquired at the LSE Registry and, yes: it was possible to change to Philosophy instead of Statistics. And so it was that Popper ensured I would never be rich.

Next, another stroke of luck. There was only one option in the Philosophy provision then. This was only the second year it had been going – before that the department had only done ‘service’ teaching. You could choose either Moral and Political Philosophy or Mathematical Logic. I was the only one in my year to take Mathematical Logic and it turned out that if you made the choice you were assigned Imre Lakatos as your tutor. He got me all sorts of special permissions to go on studying some maths and stats alongside philosophy. He set me a ferocious list of tasks, including working through Stoll’s *Set Theory and Logic* and Courant and Robbins’ *What is Mathematics?*, telling me not to see him again until I had worked through the list. I think he believed he would not see me again. When he did (shortly before Christmas), he branded me a ‘hopeful monster’ and from then on took a very keen interest in my studies and, later, my early career. Studying his *Proofs and Refutations* was the intellectual event of my undergraduate study.

From there I went into a career entirely at LSE (aside from various visiting positions). In some ways, I regret the lack of variety, but I could not have been in a better place to research philosophy of science.

What do you see as the main purpose of philosophy of science?

Although I never got very much out of reading Locke, I do think he had absolutely the right characterisation of the role of a philosopher – to act as an ‘under-labourer to the scientist’. So philosophers of science should be out just to articulate the intuitive principles by which scientists judge theories in light of evidence, and to clarify some of the positions of scientists, because they have not found the time to think through their positions with full logical rigour – or because they have more important things to do! Of course, scientists (especially from the ‘softer’ end) don’t always get it right – witness the enormous exaggeration of the evidential virtues of randomization within the clinical trials community. And then philosophy of science can step in and try to make corrections. But all good philosophy of science is, as we like to put it in our department, ‘continuous with science itself’.

What spurred your interest in evidence-based medicine?

Well, I wanted to do work that might impact outside of philosophy of science. But the main spur was undoubtedly a host of conversations over dinner with my wife. She is a consultant physician (though her first degree was in Philosophy at LSE). Of course, it would be hard to be against basing *any* body of claims and judgements on evidence. (As Hume said in the *Enquiry*: “A wise man proportions his belief to the evidence [across the board].”) The issue was always in the details: What counts as the strongest evidence for the effectiveness of medical intervention and why? What happens when evidence of different types pulls in opposite directions? Is clinical experience a legitimate source of evidence alongside results from clinical trials? It was always clear to us both that, while it undoubtedly had its heart in the right place, evidence-based medicine exaggerated the epistemological merits of randomised studies and hence tended to downplay the real significance of other types of evidence.

I ought also to mention my former colleague, Peter Urbach, who had been thinking about the methodology of clinical trials some years before I began to. I was initially resistant to his Bayesian analysis (as leaving too wide a role for subjective judgement), but I later became much more sympathetic. Bayesian principles are altogether more in line with ‘educated, scientific common sense’ than those involved in orthodox ‘classical statistics’.

What impact did Imre Lakatos have on your work?

It will be clear from my answer to your first question that Imre’s impact on me was enormous. Another strand of my work has been to clarify, and I hope improve, on Lakatos’s views on what counts as progressive science (through better analysis on what counts as predictive success in science and why such successes provide stronger evidence for a research programme than successfully accommodating empirical results after the fact). But, aside from my having developed some specific Lakatosian themes in my work, I do feel that in general, it was by sitting at Imre’s feet as an apprentice (my first job was as his Research Assistant) that I learned *how* to do serious philosophy of science. He was massively generous with his time and efforts to improve my early fumbblings.

How has your work on Structural Realism come to impact philosophy of science?

Good question. I did my usual job of publishing the original paper in the most obscure place. (Many of my better papers were written for conferences and published in *proceedings* – nowadays of course, you’re not supposed to do that and have to aim for the ‘top’ journals.) It’s always pleasant to get attention, but I have been surprised in this case: I made it completely transparent that what I

was doing in the ‘Best of Both Worlds’ paper was reviving a position initially fully developed by Poincaré. The papers where I go a bit beyond Poincaré – by defending what some people have called ‘Ramsey Sentence Structural Realism’ (it’s just Structural Realism really; no other version is coherent) – have attracted less attention, but then I did publish them obscurely!

Where do you see philosophy of science in ten years’ time?

Popper used to distinguish prophecies and predictions. The latter being based on well-confirmed (sorry: corroborated!) theories. Like Popper, I don’t put much store by prophecies: I don’t know where the subject will be in ten years’ time. But there is one change of direction that I would like to happen. For the past few decades there has been a great deal of excellent work on specific philosophical problems arising from science. For example, on trying to articulate a believable interpretation of quantum mechanics, or working out exactly what is involved in Darwinian evolutionary theory. But the ‘grander’ problem of the rationality of science and of theory-change in science has largely dropped out of focus since the Popper–Kuhn–Lakatos days. It would be nice to see a revival.

Where do you think traditional areas of philosophy, such as language and mind, stand in light of recent hard-science work in these areas?

Well, I have no trouble with philosophy of language – much of which is continuous with logic. Though I do think that some of the most interesting recent work, for example that of Kim Sternerly, is involved with the issue of how various linguistic abilities, both syntactic and semantic, might have evolved. Philosophy of mind is a different issue. I struggle really to find a defensible role for it. I guess I am largely an unreformed positivist. If it isn’t a question of clarifying some potentially confusing bits of science but also involves making substantive claims about the ‘mind’, then those claims ought to be testable – and that would be indistinguishable from neuroscience. To pick one example, I find the debates about the ‘modularity’ of the mind pretty barren. Whether or not there is an interesting notion of ‘modularity’ and, if so, whether and to what extent the mind/brain is modular, seem to me clearly questions for science itself – in this case, neuroscience. I just don’t see any role for philosophy.

The BJUP team is extremely grateful to Professor Worrall for taking the time to answer our questions in such detail.

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