
THE REASONER

VOLUME 9, NUMBER 3
MARCH 2015

thereasoner.org
ISSN 1757-0522

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EDITORIAL

It is a great pleasure to return as guest editor of *The Reasoner*, especially as this time I had the opportunity to interview three towering figures in contemporary philosophy of biology, based in three different continents, about the characteristics of this field and the ways in which it contributes to general philosophy: Professor [James Griesemer](#) from University of California Davis; Professor [Rachel Ankeny](#) from the University of Adelaide; and my colleague Professor [John Dupré](#) from the University of Exeter. I hope you enjoy their discussion as much as I did, and that you take this as an invitation to reflect on the relation between the philosophy of the special sciences and philosophy at large, as well as on the role that philosophers of science can play in developing understandings of the world at large. I view this as an extremely important conversation, as too often it is assumed that the only relevance of the philosophy of special sciences is to the development of the specific fields that it analyses (and even this may be questioned, especially in cases where philosophical and scientific work are com-

pletely disconnected). On the contrary, I think that serious attempts to ground philosophical insight on the historical and scientific study of specific research areas should be seen as crucial contributions to general epistemology. As demonstrated countless times in the history of philosophy, abstract discussions of modes of knowledge can benefit enormously from critical reflection on how knowledge is actually developed and used—such as that emerging from the study of specific reasoning processes, and their relation to ever-shifting practical constraints, opportunities, and social and material infrastructures. An excellent exemplification of this



approach is the work of Werner Callebaut, Scientific Director of the Konrad Lorenz Institute for Evolution and Cognition Research and Professor in philosophy of science at the University of Hasselt (1995–2009) and Vienna (2009–2014), who died unexpectedly in November last year. I want to take this occasion to honour and highlight his contributions, which were built on insights from general philosophy (particularly, over the last few years, Kantian scholarship), philosophy of science (especially debates on theory change and perspectivism), history and philosophy of biology, and several scientific fields (including developmental and evolutionary biology, cognitive science and economics). This unique capacity to bridge disciplinary boundaries led Werner to important contributions to central philosophical debates such as the role of naturalism, models, perspectives and representations in the development of knowledge. This outlook on the role of the philosophy of science is championed by many scholars within the philosophy of biol-

ogy, as well as by societies like the International Society for the History, Philosophy and Social Studies of Science and the Society for the Philosophy of Science in Practice, but is too often dismissed as irrelevant within general epistemology. Of course, efforts towards improved communication should come from both sides, and I should note that few philosophers of biology (including myself) pay attention to contemporary developments in epistemology and logic. This is partly a matter of cognitive constraints, as it is of course very difficult to keep abreast of a large variety of scholarly discussions, especially when trying to follow scientific debates at the same time—Werner was quite unique in that respect. The Reasoner is ideally positioned to provide a conduit for dialogue and confrontation across philosophical sub-fields, and I hope contributors will continue to take advantage of this venue in this way.

SABINA LEONELLI
University of Exeter

FEATURES

Interview with Rachel Ankeny, John Dupré and James Griesemer on the philosophy of biology

Sabina Leonelli: How would you characterise the philosophy of biology, with respect to other branches of philosophy?

John Dupré: Philosophy of biology reflects on the methods, assumptions and findings of the life sciences. In recent decades it has tended to focus overwhelmingly on evolutionary theory, but more recently it has expanded its scope to include a much wider range of work in biology. Philosophy of biology is generally assumed to be a subfield of philosophy of science which, in turn, provides an essential perspective on epistemology and metaphysics. For naturalists, who believe that science is our best way of knowing about the world, understanding how science works is essential to epistemology, and understanding the content of what science tells us about the world is central to metaphysics. The latter claims have, however, led to some often heated debates with metaphysicians and epistemologists who do not share the naturalistic viewpoint. The recent growth of philosophy of biology, as also of philosophy of physics and of other particular sciences, reflects in part increasing doubts about the existence of any universal or general truths about science and, concomitantly, doubts about the value of so-called general philosophy of science.



Rachel Ankeny: I generally view philosophy of biology as a subfield within philosophy of science, which in turn is a field that primarily has explored epistemology but also issues relating to metaphysics and ethics. Philosophy of biology arguably has begun to reorient the traditional epistemological assumptions which underlay general philosophy of science

due in part to its tendency to focus on the physical sciences. Given that the biological and biomedical sciences explore living, evolving, and contextualized entities, the types of philosophical issues that arise within it are considerably different than those envisaged in most general philosophy of science.

James R. Griesemer: Philosophy of biology is a “philosophy of X,” like other specialty “branches” of philosophy such as philosophy of art, philosophy of religion, or philosophy of physics. As such, some of its problems come from the special subject matter it studies rather than out of “general” philosophical questions that seem to transcend particular subject matter such as



“what is knowledge?”, “why is there something rather than nothing?”, “what is a/the good life?”. Philosophers of biology seek answers to questions about how best to understand concepts, methods, practices, and theories in the life sciences, e.g., whether fitness is a causal concept, how general is Darwin’s theory of evolution by natural selection, or what is/can be a gene. They also seek to understand substantial changes of method and practice, such as the turn toward “model organisms” and experimentation in the late 19th and 20th centuries, or how genetics became (or was superseded by) genomics, or the impact of digital computers and the Internet on theories (stochastic theories, agent-based models) and practices (simulation, sophisticated statistical methods, big data) in the life sciences since the 1960’s. Increasingly, philosophers of biology are interested in the entanglement of biologists’ pursuit of knowledge about the living world with social, economic, and political practices and processes, such as the increasing engagement of ecologists with the role of humans in ecosystems. In my view, people come to philosophy of biology as a research subject either, like myself, from biological backgrounds seeking answers to broad questions of concept, method, practice, and theory about biology, or from philosophical backgrounds seeking answers to general philosophical questions for which the special subject matter of biology poses special problems to epistemology, metaphysics, or ethics or holds special promise of expansion of or challenge to general philosophical views, e.g., on concepts of simplicity, similarity, causation, or the moral worth of non-human animals.

SL: How do you think this field contributes to a philosophical understanding of scientific reasoning?

JD: If philosophy of biology didn’t contribute to our understanding of scientific reasoning, this would be a damning indictment of the field: this is one of its central aims. The more difficult question is whether it contributes to the understanding of scientific reasoning generally, or rather just to the understanding of reasoning in biology, or in particular areas of biology. A moderate answer is that it does both to some degree. Concepts such as explanation, causation, induction, scientific model or law, etc., have relevance across the sciences, and provide legitimate space for a general philosophy of science. But what can be said about them in general is too abstract to have much immediate relevance to particular sciences, and

their role in reasoning in, for example, biology to specific sub-fields of biology. Philosophical insight into these general concepts is a necessary input into the analysis of reasoning in specific areas of science, but more detailed contextualisation with respect to methods, practice and theory in particular scientific fields, as for example is studied in philosophy of biology, is essential for understanding of scientific reasoning.

RA: I believe that understanding reasoning in the biological and bio-medical sciences is an essential part of coming to a more well-rounded understanding of scientific reasoning in general. To base our vision of science on any one particular field within it undoubtedly would render our views of scientific reasoning (and scientific practice which I believe is a critical context for the development of any account of scientific reasoning) far too narrow and constrained. The philosophy of biology has made important contributions to key debates about scientific reasoning with regard to experimentation, laws, and models, just to name a few topics. Often the contributions that have been made are critically grounded in the complex and messy details that make biology itself so interesting, and hence many of the most provocative and productive accounts of biology draw on historical, sociological and other disciplinary methodologies as the basis for their explorations of scientific reasoning. These rich approaches have assisted us to develop a much deeper understanding of scientific practice and reasoning more generally.



JRG: Since the positivism(s) of the 19th century, biology has been thought of as a science in the middle of a hierarchy of sciences: not fundamental like physics, nor so special, messy, and fraught as the social sciences as to risk at times the epithet “pseudo-science”. This hierarchical view, dividing sciences into fundamental and special, poses problems for a general theory of scientific reasoning, since what seems to work in physics (highly mathematized, general theories of astonishing accuracy, depth, and explanatory power but only for the very simplest of phenomena) appears not to work well for the “special” sciences, which may seek or settle for statistical, un-law-like regularities, explanations and predictions of limited and contingent scope in exchange for some power of control over phenomena in a limited context of great practical interest or outright eschew universal laws in favor of local mechanisms and small subsets of known causal factors as most salient to reasoning. Model-based views of science and scientific reasoning are far more popular in philosophy of biology than in so-called “general philosophy of science” because the diversity of reasoning practices in the sciences is widely recognized by those who do not seek explanatory reduction of all science to physics by deriving laws of the special sciences from laws of physics. In taking

biology as subject rather than a positivistic view of physics for understanding scientific reasoning, we have learned that there is no single best all-purpose theoretical model, so that practical, pragmatic, and ethical concerns can find their way into biological reasoning in ways that suggest a deep understanding of scientific reasoning will also be messy. A tidy view of scientific reasoning is bound to be a false or misleading view.

SL: In your work, are you interested in contributing to discussions in general philosophy, and if so, how?

JD: Very much so. To begin with, and referring back to my last comments, the philosophical understanding of concepts in general philosophy of science, such as causation or explanation, evolves in two-way interaction with studies in particular sciences. The test of their validity is to a considerable degree their usefulness in application to particular sciences. Second, as a naturalist, I believe that the philosophy of science in general, and of biology in particular, has a central contribution to make to epistemology and metaphysics. It seems bizarre to suppose that an understanding of how we come to know the world and what we know about it could be pursued in isolation from philosophical examination of our greatest successes in coming to know about the world. Third, and of greatest interest in my own work, concepts central to many areas of philosophy are open to major illumination from biology. One very obvious example is the nature of the human, and the concept of human nature. Human nature, of course, is a concept that has figured in areas ranging from ethics and political philosophy to the philosophy of mind and philosophical psychology; but it is also a concept that has derived great illumination from the philosophy of biology. As one related example, an important trend in recent work on personal identity is so-called animalism, the view that the persistence of a human is just the persistence of an animal. Unfortunately this proposal is generally pursued as if our understanding of what an animal is had reached its culmination with Aristotle. This philosophical movement badly needs to be connected with the active and exciting discussions in contemporary philosophy of biology about the nature of an organism. Another issue that has concerned my own work for several decades has been the nature of classification and of natural kinds. This has been a major topic in metaphysics for millennia, and underwent a particular surge of interest in the 1970’s with the work of Putnam and Kripke. Many examples employed in this work were drawn from biology, but often with a very naive understanding of the real problems in biological classification. The nature of biological classification, on the other hand, has been a major topic of work in the philosophy of biology for many years, and more sophisticated appreciation of the character of biological kinds has gradually had a major impact on general philosophical understanding of classification and of the kinds, natural or otherwise, that classification aims to distinguish.

RA: My research on model organisms is a good example: many discussions about ‘models’ in general philosophy of science have been rather impoverished or at least not well-grounded in the actual practices of scientists who use such models. Together with you [Sabina Leonelli] among others, I have sought to contribute to more general discussions of the roles and validity of models, using detailed case studies focused on a particular set of practices within contemporary biology.

My work in the philosophy of the biological and biomedical sciences also has explored the role of cases in these fields, a theme that makes contributions to developing an understanding of the units of investigation used in fields well beyond the life sciences, and to exploration of the epistemological bases for the use of such units of investigation in a range of types of practices. Finally, recent work on norms associated with open science and data sharing has much broader implications for those interested in excavating values associated with the generation and sharing of knowledge within academia and beyond.

JRG: It is undoubtedly the hope of every scholar to have an impact beyond one's own special subject. Although I am no different in this regard, I view my subject as "biology studies" rather than philosophy of biology *per se*. I engage historical, sociological, and cultural methods, findings, and colleagues as well as philosophical ones. I seek answers to questions that are historical or sociological and not only philosophical, e.g., in my work on the Museum of Vertebrate Zoology at Berkeley, which is as much interested in the social organization of work as it is in the role of researchers in the museum in originating the new discipline of "evo-devo". With age and experience working in a philosophy department (since I have no academic degrees in philosophy), I have come to better appreciate some of the goals and some of the methods of "general philosophy" and to see how views in epistemology, metaphysics, and ethics bear on my work and how my work might bear on these "core" topics in philosophy. My epistemological views regarding empirical biology, from studies of genetic, embryological and evolutionary concepts of germ and soma, genotype and phenotype, gene and character, are converging on an externalist "tracking" account like those of Nozick or Roush. My metaphysical views on biological individuality and reproduction processes are converging on a "process ontology," although I am reluctant to call it Whiteheadian, or to align with either perdurantism or endurantism in analytic metaphysics. Perhaps my view will amount to nothing more than Russell's quip that event is to process as point is to line and that's all there is to be said on the matter. I think a more exciting prospect for an impact of my work on general philosophy is an approach to linking epistemic, ontological, and ethical dimensions of reasoning in an account I am developing of scientific reasoning practices in biology. Even if the model is flawed, it might provide a useful general heuristic for exploring the entanglement of ethical concerns in what are usually taken to be "purely" epistemic or ontological questions.

Three logicians walk into a bar—a modest proposal for teaching epistemic logic

When teaching epistemic logic to undergraduates, instructors might try this story that has floated around the internet for a while:

Three logicians walk into a bar. Bartender ask: 'Y'all all want a beer?' Says the first: 'Hmm..., don't know.'
The second: 'Me neither!' Goes the third: 'So yes! Three pints, please'.

Readily found funny, and thus a genuine joke, or not, these are the learning outcomes: (i) achieve a correct translation of the speakers' commitments into a formal language with epistemic operators; (ii) evaluate the reasoning underlying the third

logician's inferential behaviour with respect to validity, and (iii) explain why (only) someone with a formal background might find the story amusing. Based on (i-iii), ask students (iv) to construct an analogous story—perhaps a better one!

In class tell this story twice and present it on a screen or hand-out while giving students five minutes to "explain what's going on here, please!" Have students form groups of three—quickly—discuss for five minutes, change partners, and repeat for another three minutes. Then ask for explanation-proposals; collect key-words on the blackboard, continuing until "all" is said. Now invoke the details (below), making clear that students should uncover every assumption needed to explain the story.



The following assists in creating less usual class-time. Do this well and your students might even find it is fun to self-develop along these lines, where 'L_n' abbreviates 'logician n', 'K_{L_n}' stands for 'L_n knows that', 'L_n: ϕ' denotes 'L_n commits to ϕ', and 'p' stands for 'All (logicians) want a beer'. Other symbols take their "classical" meaning.

- (1) Bartender: p ?
- (2) L₁: $K_{L_1}(p \vee \neg p)$ [i.e., "I, L₁, do not know whether p or not p ."]
- (3) L₂: $K_{L_2}(p \vee \neg p)$ [i.e., "I, L₂, do not know whether p or not p ."]
- (4) L₃: p

L₃'s reasoning is: "if L₁ did not want a beer, then L₁ would have replied '¬p'; but since L₁ didn't state '¬p', infer that L₁ wants a beer. Similarly for L₂. Finally, speaking from L₃'s perspective, since I want a beer, it follows that all of us want a beer. Hence: state 'p'." (One may decompose 'p' in order to formalize L's reasoning as: '∀x [logician (x) → want (x, beer)]', where x ranges over the domain of those having entered the bar.)

Easy enough! You could stop here; chances are many of your students won't get further on their own. But the best is yet to come! Having pointed the story's "logical side," move towards a broadly language-philosophical analysis to uncover implicit assumptions. (Extra points to whoever readily points out such assumptions!) To elicit answers use the Socratic Method, asking relevant questions. We now provide short versions of what better answers amount to.

First, under normal assumptions on human memory, one must assume that the logicians had not previously exchanged testimonies on their drink-preferences, particularly that none of them has stated that she visits the bar *in order to have a beer* (as opposed to milk, tea, or a change of location). Yes, that's odd; one regularly shares drink-preferences explicitly *before* a group sets out. In fact, 'shall we go for a beer?' is the unmarked form in informal contexts. Stay cool as this objection arises; you can blame the oddity on our characters being logicians. Call this the 'No Previous Testimony-Condition (for normal memory)'.

Second, L₃ must assume that the others answered the bartender's question truthfully, and that each can introspectively

access their personal drink-preferences. Hence, one must assume that they stated $\neg K_{L_i}(p \vee \neg p)$ for reasons other than a lack of introspective access. After all, if either L_1 or L_2 does not want a beer, or if at least one lacks access to their preferences, then L_3 's assertion in line (4) is incorrect, hence her reasoning would be *invalid*. Call this the 'Truthfulness or Non-(Self-)Deception Condition (under introspective access)'.

Third: the three logicians must coordinate on the same meaning of 'all' in line (1). While semantic coordination remains concealed when formalizing the bartender's question as 'p?', the need to coordinate nonetheless becomes clear by distinguishing a *collective* from a *distributive* reading of 'all'. Take 'the logicians carried all the burden of the department's restructuring', for instance. On the collective reading they *jointly* carried this burden; the distributive reading sees each do this *on her own*. (Exchange 'burden' for 'piano' if you like.) Obviously, truth-conditions for both readings differ; the last sentence is true only if each logician carries the burden individually, the former is true only if they carry the burden together. Similarly the bartender's question may query whether the three logicians wish to share *one and the same* beer—few things are inconceivable with logicians—or whether each wants their own. So they have to coordinate on the distributive reading; otherwise L_3 's reasoning is invalid (better: L_3 's answer would be *incorrect* if at least one of them had a collective reading in mind). Call this the 'Meaning Coordination-Condition'.

Finally, at least one further meaning-coordination condition is needed, a trickier one: Witness a bartender asking "y'all want beer?" and you witness that 'I don't know' normally reveals ignorance of the utterer's personal preferences but normally does *not* reveal ignorance of others' preferences. Hence, 'I don't know' normally fails to mean 'I don't know whether everyone wants a beer'; rather, it means 'I don't know yet what I want to drink.' Call this the 'Conventional Meaning-Condition'.

In private communication, a colleague of ours—a logician—argued that the first condition is *dispensable* given the other three, i.e., Truthfulness, Meaning Coordination, and Conventional Meaning, jointly suffice for L_3 's reasoning to be valid; if so, the No-Previous Testimony condition is superfluous. But we take No-Previous Testimony to ensure that logicians #1 and #2 are unable to truthfully state p ; so, in our view, this condition remains needed. Incidentally, this very disagreement may initiate a discussion among students on what 'necessary' and 'dispensable' mean here (hint: necessary for the joke to work vs necessary for L_3 's inference to be valid).

One story then, four conditions, one instructor, and your students. Where is the joke? Well, why not discuss also this question, and openly too! *If* there is a joke, we think, it resides with our logicians interpreting the bartender's question differently in this context than is done conventionally. Again, blame it on them being logicians.

"Very well," you say, "but is that story funny?"—or so you will ask and be asked. Well, yes and no! Irrespective, your students better understand all assumptions underlying the relevant

reasoning.

JEROEN SMID
Lund University
FRANK ZENKER
Lund University

NEWS

Inductive logic and confirmation in science II, 24–25 October

The second Inductive Logic and Confirmation in Science Conference was held at the University of Utah this past October 24th and 25th. The conference was hosted by professors Jonah Schupbach and Jacob Stegenga. The conference focused on the use and role of inductive logic and confirmation in science and the philosophy of science. One question that was discussed was whether science has the ability to fix its mistakes. Two of the papers presented worries regarding science's ability to do this. Felipe Romero argued that science is self-correcting only if a number of conditions are met. However, the social structure that science is embedded in often does not allow these conditions to be met.

Matt Haber discussed what he calls positively misleading errors, which occur when, as we collect more data, we nonetheless converge on a mistaken hypothesis. Understanding positively misleading errors, Haber urged, will give us a better understanding of how we extract information from large data sets.

Another theme from the conference was the logic and justification of how we update our beliefs and evaluate theories. Justin Dallman argued that we should disregard evidence for well corroborated beliefs in favor of evidence for beliefs about which we have little information. Doing so, Dallman argued, will result in more accurate beliefs.

Elliot Sober, the first keynote speaker, dealt with theory choice in evolutionary biology. He examined a number of epistemic issues concerning how similarities provide evidence for common ancestry, for example, under what conditions will the fact that two species have a common trait be evidence that they share a common ancestor and which types of similarities provide strong evidence for common ancestry. Sober showed how different uses of the likelihood principle can illuminate these issues.

An important issue discussed here was the role that pragmatic considerations play in justifying our theory choice. Aaron Kenna argued that induction is justified on pragmatic grounds—induction dominates other predictive models in the sense that it retains any potential virtues of any non-inductive model while possibly having virtues these other models lack.

Jonathan Livengood argued that our selection criteria for models are infected with pragmatic considerations. Livengood showed that four selection criteria—mathematical tractability, loss minimization, statistical efficiency, and robustness—are infected with pragmatic considerations, like suffering a loss of time or money.

Several papers examined and clarified the logical concepts that are at play in confirmation and induction. Sean Walsh examined the probabilistic liar, a statement that says of itself that it is unlikely. Walsh examined the nature and problems with the kinds of self-reference that are involved in the probabilistic liar and different solutions to it.

Marta Sznajder examined the geometrical representations of conceptual frameworks in Carnap's 'A Basic System of Inductive Logic.' She discussed how these geometrical representations can depict the relationships between concepts. She also discussed two rules that link confirmation to features of these geometrical representations.

Paul Weirich examined arguments to the conclusion that agents' degrees of belief must conform to the probability axioms. He evaluated attempts to ground probabilism in comparative norms of belief. Weirich concluded that satisfying these comparative norms is necessary but not sufficient for conforming to the probability axioms. Therefore, comparative norms do not supply a foundational argument for probabilism.

The last set of themes discussed at the conference were Inference to the Best Explanation (IBE), Bayesianism, and the principle of total evidence. Tania Lombrozo, another keynote speaker, examined how the beauty of theories affects their explanatory power. Lombrozo looked at whether explanation improves or impedes learning when the theory is beautiful or ugly. The results of Lombrozo's empirical tests showed that, when the theory was beautiful, explanation improved learning. However, when the theory was not beautiful, explanation hurt learning.

Leah Henderson, the third keynote speaker, discussed the compatibility between Bayesianism and IBE. She argued that the compatibility of Bayesianism and IBE emerges from the Bayesian proceeding in the manner that they normally would. This occurs because a Bayesian will assign higher probabilities to better explanations. In this way, emergent compatibilism can explain why we prefer better explanations.

Greg Gandenberger argued that Bayesian arguments that scientists should not use frequentism because it violates the likelihood principle are too quick. He said that these arguments fail, but suggested an alternative way in which we can still see frequentist violations of the likelihood principle as a weaknesses.

Greg Wheeler looked at certain violations of the Bayesian principle of total evidence where using less evidence actually results in objectively better outcomes. Wheeler resolved a puzzle responsible for this "less is more effect" and showed how this effects is related to coherentism.

Bengt Autzen clarified and defended the principle of total evidence. Autzen said that we should conceive of the principle of total of evidence as being an intra-theoretic constraint, not inter-theoretic, and, once we do, we see that a number of challenges posed for the principle no longer work.

The second conference on Inductive Logic and Confirmation in Science highlighted the diversity of the ongoing research in the area. The conference included both philosophers and scientists, established figures and those earlier in their career. The papers discussed historical topics as well as contemporary concerns, theoretical matters as well as applied issues. In addition to being enlightening, it was an enjoyable two days in the Salt Lake Valley.

ANTHONY P. SMITH
University of Utah

Epistemic and practical normativity: explanatory connections, 16 January

The workshop was held at the University of Southampton as part of their 'Normativity: Epistemic and

Practical' AHRC-funded project. It considered how epistemic and practical normativity are connected to each other with regards to how we explain them.

Asbjørn Steglich-Peterson presented first ('Epistemic Normativity: Absolutist or Instrumental?'), with a response by Ema Sullivan-Bissett. Steglich-Peterson argued for consequentialism about epistemic normativity. While the view's opponents see epistemic normativity as divorced from practical and moral normativity, Steglich-Peterson observed that separating normativity like this would make epistemic assessments of beliefs insignificant in light of other evaluations. Consequentialism, he thinks, can avoid this. Assessments of a belief concerning its truth are indeed distinct from those using other measures, but do not in themselves stipulate whether a subject ought to have the belief. Practical and moral considerations determine if she should seek the truth in any given situation.

Conversely, in the last talk ('Why and How To Be An Epistemic Nonconsequentialist'), Kurt Sylvan argued for nonconsequentialism about epistemic norms. Victor Verdejo gave a response. Sylvan proposed that consequentialism cannot account for the fact that rationality is an epistemic norm, since following the dictates of rationality does not always lead one to achieve the suggested epistemic goals of truth and knowledge. Further, the view faces the additional criticism that consequentialism about epistemic value is, for Sylvan, subject to the Swamping Problem. Non-consequentialism, however, can account for epistemic normativity. Those not following the requirements of rationality are subject to blame for ignoring the objectively-construed norm of respect, in this case, for truth.

The second presentation ('Reasoning with Reasons'), was given by Daniel Star with a response by Daniel Fogal. Star disagreed with the views of Setiya and Way, who think that a reason (epistemic or practical) is best understood as being a premise in good reasoning. This, Star argued, is only to describe the role reasons play and leaves unspecified what realises that role, which he suggested is evidence that one ought to do something or believe that something is the case. Further, he argued that we should not think of reasons as being simply premises in good reasoning that are appropriate to act on because frequently a reason for acting is outweighed by other reasons, and so is inappropriate to act on.

The third talk was by Ulrike Heuer ('Two Kinds of wrong Reasons'), with a response by Chris Howard. It addressed the debate concerning how to characterise right and wrong kinds of reasons. Heuer argued that fitting attitude accounts try to explain this contrast but alternative suggestions, which take wrong kinds of reasons to be those that do not rationalise the attitude and are not adhered to directly, are concerned with a different, unobvious, distinction. Further, she argued, the contrast drawn by such alternative proposals do not hold across attitude types. We cannot, then, explain the reasons for every sort of attitude with a single theory.



The next workshop in the series will run this spring.

SOPHIE KEELING
University of Southampton

Scientific discovery in the social sciences, 30–31 January

The conference was the final event for the Economic and Social Research Council funded project [Automatic Generation of Scientific Theories](#) and supported by the Centre for the Philosophy of Natural and Social Science at the London School of Economics. The project created a methodology for automatically developing theories in psychology using techniques based on genetic programming. A system for representing psychological data, a class of process based models, and algorithms for evolving models was produced along with a theory language for implementing cognitive models in a symbolic process based paradigm.

Conference keynote speakers, presenters and participants came from a wide range of countries including Canada, Greece, Spain, Poland and the United States, and disciplines as varied as computer science, economics, particle physics, philosophy and sociology. For reasons of space not all the talks are mentioned here but abstracts and slides can be found [here](#).

The workshop began with the first keynote by Margaret Boden (cognitive science, University of Sussex) who considered the feasibility of computers conducting social research. She discussed the difficulty of appropriately interpreting some kinds of data, such as tweets, and how this might relate to issues about the analysis of big data. Next was a talk on computational scientific discovery from Piotr Giza (philosophy, Maria Curie-Skłodowska University) examining the insight which automated discovery systems could offer into questions about the nature of induction. Fernand Gobet (psychology, University of Liverpool and London School of Economics) presented an overview of the results achieved by the *Automatic Generation of Scientific Theories* project to date and offered suggestions about problems and prospects for the future. The second keynote was a joint presentation by Maria Dimarogkona (philosophy, National Technical University of Athens) and Petros Stefanias (mathematics, National Technical University of Athens) about the roles of syntactic and semantic considerations in the formalisation of social science theories. It covered the importance of categorical abstraction of the concepts of satisfaction, sentence, signature and model for characterising and integrating the diverse logics used in scientific theory formalisation. The first day ended with a presentation by Abigail Klassen (philosophy, University of York) on the extent of legitimate reduction within social science theories.

The second day opened with the third keynote by Kevin Dunbar (psychology, University of Maryland College Park) who discussed whether the advent of big data meant the end of traditional hypothetico-deductive methodology in science. Using data collected from laboratory scientists it was argued that big data will bring about significant changes in scientific methodology but there is still a role for hypotheses. The conference concluded with some reflections from Amos Witztum (economics, London School of Economics) and Peter Abell (management science, London School of Economics) on the extent to which economics could legitimately be thought to engage in scientific discovery, and the types of Bayesian causal mechanisms which

could underpin this.

The conference was organised by [Mark Addis](#), [Fernand Gobet](#), [Peter Lane](#) and [Peter Sozou](#).

MARK ADDIS
Birmingham City University

Calls for Papers

THE REALIST TURN: special issue of *Method - Analytic Perspectives*, deadline 15 March.

CAUSATION AND MENTAL CAUSATION: special issue of *Humana.Mente*, deadline 15 March.

INDUCTIVE STATISTICAL METHODS: special issue of *Entropy*, deadline 31 May.

LOGIC THEOREMS: special issue of *Logica Universalis*, deadline 31 July.

WHAT'S HOT IN . . .

Uncertain Reasoning

The question of telling certainty from very high probability is conceptually intriguing, technically demanding and philosophically slippery. The development of the theory of probability from Bernoulli to Borel is dotted with more or less successful attempts at providing a theoretical argument in support of the following otherwise very intuitive consideration. Taking into account arbitrarily small orders of probability can at best lead to inaction, and often leads to full-fledged neurosis. As an illustration, consider that A. Gelman, N. Silver, and A. Edlin (2012: What Is the Probability Your Vote Will Make a Difference? *Economic Inquiry*, 50(2), 321-326) calculate that the probability of casting a decisive vote in the US presidential elections is (on average) in the region of 1 in 60 million. Now compare this with the odds of 1:112 which are being reported by the [US National Security Council](#) of dying in a motor vehicle crash. Though the latter are computed with respect to an individual's lifetime, one may understandably pause and think whether driving to cast one's vote is really worthwhile. Luckily for our democratic societies common sense often prevails and dismisses the above calculations (or attempts at them) as plain neurotic.



Be this as it may, we still would like to have a good theory of the extremely unlikely—or if one plans to make money in financial markets, of the morally certain. Formalising this difficult concept is one of the key ideas underpinning the game-theoretic, as opposed to measure-theoretic, foundation of probability put forward over the past couple of decades by Glenn Shaver and Vladimir Vovk. The idea, in a nutshell (see *What's Hot in Uncertain Reasoning* on the September 2012 issue of [The Reasoner](#) for more background) is to set up a game between Skeptic and Reality which provides an interpretation of

an *almost sure event* as one allowing Skeptic to become infinitely rich without facing the risk of going broke if the event fails to happen (this is the analogue of a probability 1 event in measure-theoretic probability). This setting provides the interpretation of a *winning strategy* for Skeptic. An interesting question that followed the initial developments reported in G. Shafer, and V. Vovk (2001: *Probability and Finance: It's Only a Game!* John Wiley and Sons) concerns the conditions under which Reality has a(n intuitively meaningful) winning strategy. This has been the topic of recent work which takes an interesting twist in K. Miyabe and A Takemura (2015: [Derandomization in game-theoretic probability](#). *Stochastic Processes and Their Applications*, 125, 39-59.) The paper, as it can be expected, is quite technical—it involves, among others, diagonalisation methods in complexity theory—so I will refrain from summing it up. I'd just like to point out why the question is conceptually intriguing besides being technically quite involved. In this game-theoretic set up Reality can be seen as generating random variables against which Skeptic is challenged to play their best strategy. Hence a 'strategy for Reality' effectively means de-randomising Reality's behaviour as a consequence of their (rational) choice. Hence the conceptual quandary and the mathematical challenge to disentangle it.

HYKEL HOSNI

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Evidence-Based Medicine

Alzheimer's disease is a neurodegenerative disorder associated with the aggregation of proteins in the brain, where this aggregation ultimately damages brain function. Last month, the newspapers paid a good deal of attention to a laboratory 'break-through' in Alzheimer's research. They were talking about [this article](#).

The Guardian reported that the authors of the article had found that a human molecule Brichos 'put the brakes on a runaway process in the brain that leads to the most common form of dementia ... by slowing the accumulation of sticky clumps of protein in the brain'. In fact, the authors investigated *in vitro* a mechanism in living mouse brain tissue. But granting that a corresponding mechanism exists in the human brain, can we conclude that the molecule does indeed slow the relevant protein aggregation?

Commenting on the article, [NHS choices](#) points out that '[a]lthough Brichos stopped damage occurring in a specific amyloid-related biological pathway, some of the damage associated with Alzheimer's disease could occur via other routes'. That is, the relevant mechanism linking the molecule Brichos and protein aggregation may well exist in the human brain, but the molecule may not slow the protein aggregation since there may exist

WHEN YOU SEE A CLAIM THAT A
COMMON DRUG OR VITAMIN "KILLS
CANCER CELLS IN A PETRI DISH,"

KEEP IN MIND:



SO DOES A HANDGUN.

further unknown mechanisms in humans that counteract the original mechanism involving the molecule and the aggregation. This is the so-called problem of masking. Some have suggested that one way to overcome the problem of masking is to gather some evidence of correlation, i.e., evidence that the molecule does in fact make the appropriate difference to protein aggregation in humans. For more on the interplay between evidence of mechanisms and evidence of correlation, readers might want to check out [this paper](#) by Phyllis Illari.

Over at the [EBM+ blog](#), Jon Williamson has written about [Evidence integration in systems medicine](#). There is also some information on a [Doctoral training initiative](#) at the University of Kent, to work on Evidence and its quality.

MICHAEL WILDE
Philosophy, Kent

EVENTS

MARCH

[AHR](#): Workshop on Behavior Coordination Between Animals, Humans, and Robots, Portland, Oregon, 2 March.

[BICoB](#): 7th International Conference on Bioinformatics and Computational Biology, Honolulu, Hawaii, 9–11 March.

[WiS](#): What is Science?, Barnes, London, 12 March.

[FON](#): Edinburgh Foundations of Normativity Workshop, University of Edinburgh, 13–14 March.

[PHA](#): Workshop on Powers and Human Agency, Durham University, 16–18 March.

[LI](#): Logic and Inference, Institute of Philosophy, London, 19–20 March.

[TRiP](#): Pictures and Proofs, Columbia, South Carolina, 19–21 March.

[SPR](#): Scientific Progress and Realism, University of Leeds, 24 March.

[KRR](#): Knowledge Representation and Reasoning, Stanford University, 23–25 March.

[BMHEE](#): Bayesian Models for Health Economics Evaluation, Royal Statistical Society, London, 27 March.

[SCS](#): SMART Cognitive Science: The Amsterdam Conference, Amsterdam, 25–28 March.

[PI](#): Workshop on Philosophy of Information, University College London, 30–31 March.

APRIL

[L & R](#): Congress on Logic and Religion, Brazil, 1–5 April.

[CI](#): Causal Inference Meeting, University of Bristol, 15–17 April.

[TPLP](#): Truth, Pluralism & Logical Pluralism, University of Connecticut, 17–19 April.

[PROGIC](#): The 7th Workshop on Combining Probability and Logic, University of Kent, 22–24 April.

[PL](#): Conference in philosophy and Logic, University of Belgrade, 24–26 April.

MAY

[EoM](#): Epistemology of Metaphysics Workshop, University of Helsinki, 8 May.

DT: Decision Theory Workshop, University of Cambridge, 13–19 May.
SLACRR: St. Louis Annual Conference on Reasons and Rationality, Moonrise Hotel / Washington University in St. Louis, MO, 17–19 May.
TIoP: The Idea of Pragmatism, University of Sheffield, 18–19 May.
TAMC: Theory and Applications of Models of Computation, School of Computing, National University of Singapore, 18–20 May.
MR: Metacognition and Reasoning, Dubrovnik, Croatia. 21–23 May
TRUTH AND GROUNDS: Mount Truth, Ascona, Switzerland, 24–29 May.
CD: Compromise and Disagreement, University of Copenhagen. 27–29 May
TOFB: The Odds for Bayesianism, University of Vienna, 28–30 May.

MA IN COGNITIVE SCIENCE: School of Politics, International Studies and Philosophy, Queen’s University Belfast.
MA IN LOGIC AND THE PHILOSOPHY OF MATHEMATICS: Department of Philosophy, University of Bristol.
MA PROGRAMMES: in Philosophy of Science, University of Leeds.
MA IN LOGIC AND PHILOSOPHY OF SCIENCE: Faculty of Philosophy, Philosophy of Science and Study of Religion, LMU Munich.
MA IN LOGIC AND THEORY OF SCIENCE: Department of Logic of the Eotvos Lorand University, Budapest, Hungary.
MA IN METAPHYSICS, LANGUAGE, AND MIND: Department of Philosophy, University of Liverpool.
MA IN MIND, BRAIN AND LEARNING: Westminster Institute of Education, Oxford Brookes University.
MA IN PHILOSOPHY: by research, Tilburg University.
MA IN PHILOSOPHY, SCIENCE AND SOCIETY: TiLPS, Tilburg University.
MA IN PHILOSOPHY OF BIOLOGICAL AND COGNITIVE SCIENCES: Department of Philosophy, University of Bristol.
MA IN RHETORIC: School of Journalism, Media and Communication, University of Central Lancashire.
MA PROGRAMMES: in Philosophy of Language and Linguistics, and Philosophy of Mind and Psychology, University of Birmingham.
MRES IN METHODS AND PRACTICES OF PHILOSOPHICAL RESEARCH: Northern Institute of Philosophy, University of Aberdeen.
MSC IN APPLIED STATISTICS: Department of Economics, Mathematics and Statistics, Birkbeck, University of London.
MSC IN APPLIED STATISTICS AND DATAMINING: School of Mathematics and Statistics, University of St Andrews.
MSC IN ARTIFICIAL INTELLIGENCE: Faculty of Engineering, University of Leeds.

COURSES AND PROGRAMMES

Courses

COMBINING PROBABILITY AND LOGIC: University of Kent, 20–21 April.
EPICENTER: Spring Course in Epistemic Game Theory, Maastricht University, 8–19 June.
EPICENTER: Mini-course on Games with Unawareness, Maastricht University, 22–23 June.

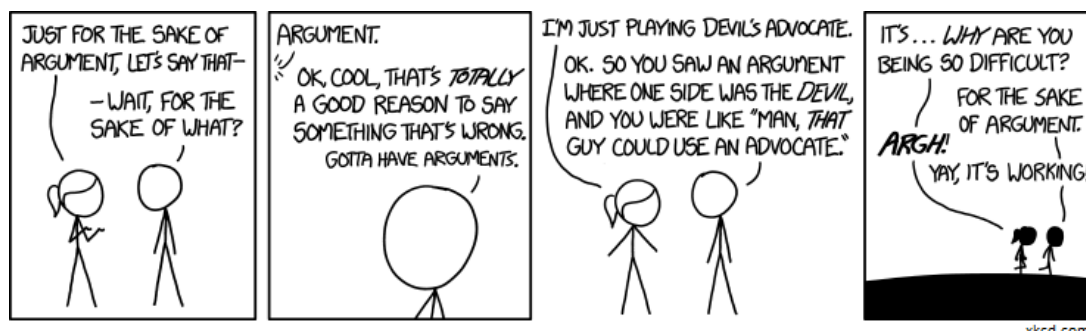
Programmes

APHIL: MA/PhD in Analytic Philosophy, University of Barcelona.
MASTER PROGRAMME: MA in Pure and Applied Logic, University of Barcelona.
DOCTORAL PROGRAMME IN PHILOSOPHY: Language, Mind and Practice, Department of Philosophy, University of Zurich, Switzerland.
HPSM: MA in the History and Philosophy of Science and Medicine, Durham University.
MASTER PROGRAMME: in Statistics, University College Dublin.
LOPHISC: Master in Logic, Philosophy of Science & Epistemology, Pantheon-Sorbonne University (Paris 1) and Paris-Sorbonne University (Paris 4).
MASTER PROGRAMME: in Artificial Intelligence, Radboud University Nijmegen, the Netherlands.
MASTER PROGRAMME: Philosophy and Economics, Institute of Philosophy, University of Bayreuth.

MA IN REASONING

A programme at the University of Kent, Canterbury, UK. Gain the philosophical background required for a PhD in this area. Optional modules available from Psychology, Computing, Statistics, Social Policy, Law, Biosciences and History.

MSC IN COGNITIVE & DECISION SCIENCES: Psychology, University College London.
MSC IN COGNITIVE SYSTEMS: Language, Learning, and Reasoning, University of Potsdam.
MSC IN COGNITIVE SCIENCE: University of Osnabrück, Germany.
MSC IN COGNITIVE PSYCHOLOGY/NEUROPSYCHOLOGY: School of Psychology, University of Kent.
MSC IN LOGIC: Institute for Logic, Language and Computation, University of Amsterdam.
MSC IN MIND, LANGUAGE & EMBODIED COGNITION: School of Philosophy, Psychology and Language Sciences, University of Edinburgh.



MSc in Philosophy of Science, Technology and Society: University of Twente, The Netherlands.

MRes in Cognitive Science and Humanities: Language, Communication and Organization: Institute for Logic, Cognition, Language, and Information, University of the Basque Country (Donostia San Sebastián).

Open Mind: International School of Advanced Studies in Cognitive Sciences, University of Bucharest.

JOBS AND STUDENTSHIPS

Jobs

Post doc: in the Emergence of Relativism, University of Vienna, deadline 1 March.

Lecturer: in Modern Philosophy, University of Cambridge, deadline 6 March.

Senior post doc: in Machine Learning, University of Cambridge, deadline 6 March.

Lecturer: in Statistics, University of Glasgow, deadline 13 March.

Professorship: in Meta-Ethics, Kings College London, deadline 15 March.

Research Associate: in Philosophy of Science, University of Kent, deadline 15 March.

Professorship: in The History of Philosophy, University of Hamburg, deadline 19 March.

Junior Professorship: in Theoretical Philosophy, University of Hamburg, deadline 19 March.

Postdoctoral Fellow: in Perceptual Epistemology, University of Toronto Mississauga, deadline 23 March.

Tenure Track: in Philosophy of Economics/Social Science, Frankfurt School of Finance & Management, deadline 31 March.

Assistant Professorship: in Analytic Philosophy, University of Saskatchewan, deadline 31 March.

Assistant Professorship: in Social and Political Philosophy/Value Theory, University of Saskatchewan, deadline 31 March.

Associate Professorship: in Philosophy/Logic, Los Rios Community College, deadline 6 April.

Studentships

PhD Position: in causal inference, University of Amsterdam, deadline 1 March.

PhD Position: in Cognitive Science, Lund University, deadline 2 March.

PhD Position: in Practical Philosophy, University of Gothenburg, deadline 3 March.

PhD Positions: in Evidence and its quality, University of Kent, deadline 6 March.

3 PhD Positions: in Causation, Complexity and Evidence in Health Sciences, Norwegian University of Life Sciences, deadline 10 March.

PhD Fellowship: in Philosophy of Mind/Philosophy of Psychology/Epistemology, University of Oslo, deadline 15 March.

PhD Position: in Collective Reasoning, University of Luxembourg, deadline 31 March.

PhD Position: in applied philosophy, University of Aberdeen, deadline 31 March.

Dissertation Prize: in Logic, Language, and Information, deadline 27 April.



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