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Contents

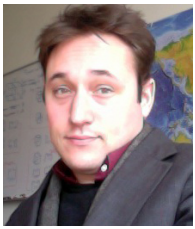
§1 Editorial

Here are two tendencies in academic philosophy.

First, there is the *drawing of distinctions*. Some problems are caused by conflating two separate issues together. Such problems can be dispelled by careful disambiguation. The drawing of distinctions is an important and useful tool, no doubt. But it has limits. We risk drawing a *distinction without a difference*, which yields no more than a cosmetic fix, and an overabundance of terminology alongside. In creating finer-and-finer-grained taxonomies, too, one risks making as many distinctions as there are objects in the target domain—in which case we have, at best, a restatement of the problem.

Second, there is *dialectical engagement*. Our work benefits and improves by meeting and overcoming challenges from colleagues. On the abstract, methodological level, this is also no doubt a very important part of intellectual process. The risks here are more subtle, and more personal: question begging and name calling; talking past each other; entrenchment and institutionalised bias; longstanding grudges and, yes, hurt feelings. We've all seen constructive engagement slide into acrimony much faster than befits intelligent adults.

Crucial and dangerous, then, this business of philosophy. Our guest this month, I'm happy to report, works to balance out the more pernicious aspects of distinction-drawing and dialectic. Greg Restall more often than not looks for *unification*, rather than difference. He uses the formalism of **proof theory** to draw connections between all kinds of reasoning practices, from mathematical proofs to linguistics and speech acts. His insights tend to focus on when apparently antithetical concepts—like proofs and counterexamples—are actually two sides of the same coin.



Similarly, Greg argues for dialectical cooperation—for *inclusion* rather than exclusion. His work on **logical pluralism** aims to establish that there are many ways of thinking about and using logic. He encourages us not to waste our time battling perceived rivals, but rather learning alongside each other, in true dialectical engagement. We work together without sacrificing our distinct perspectives. 'Plurality' expresses the richness of what we are trying to explain in a cohesive and agreeable way. Most pleasingly, logical pluralism shows how the drawing of distinctions can itself be a tool for unification.

Or maybe I'm a little biased because after our interview Greg fed me and my family a tasty dinner. There's a moral in that too, though.

Zach Weber
Philosophy, Melbourne

Interview with Greg Restall

Greg Restall is Associate Professor of Philosophy at the University of Melbourne, where he teaches, publishes, and heads the discipline with great enthusiasm.

Zach Weber: Hi Greg. Thanks for joining us this month.

GR: It's excellent to be here.

ZW: To start, how would you characterize what you do?

GR: Lots of my work is in logic, which is formal work motivated by questions in philosophy. A lot of my early work was in substructural logic, motivated by the paradoxes of self-reference, and my more recent work is in proof theory, motivated by understanding how proofs get connected to a theory of meaning.

ZW: What do we learn by looking at things proof theoretically? What do we see with our 'proof theory spectacles' on that we don't see otherwise?

GR: When we look at questions through proof theory, we can look through the fine details of arguments—not just whether an argument is valid or not, but how an argument is shaped. We can see different ways to prove something. Computer scientists, for example, might be interested in verifying that an argument is correct. Now, if you just have a program that tells you something is valid or invalid, if you just have a black box, this gives some evidence for whether or not an argument is valid, but it's not something you know you can trust—whereas when you have a proof, it can be independently verified.

Or take an example from theories of meaning. Some people think that you gain knowledge of a concept through *use*, through things that you *do*, and one of the main traditions in formal theories of meaning looks at this in terms of rules of inference, rules of proof. You come to know a concept in terms of where to apply it, the consequences that it has, and where it is introduced and eliminated. You lean through inference rules.

ZW: Is proof theory more explanatory than, say, model theoretic semantics?

GR: The more I work in it, the more it seems that proof theory and model theory are two sides of the same coin, highlighting different things you can do. One way to make the duality very clear is the way we teach logic here at the University of Melbourne, through the use of tableaux. When you've got a closed tree, turn it upside down, and this is a proof; when the tree doesn't close, this is a description of a model. That's soundness and completeness. If you have a proof, then your argument is valid; or else you have a mathematical object called counterexample, showing that the argument is invalid.

ZW: This relates to a book you're working on, *Proof Theory and Philosophy*. Tell us about that.

GR: I've been working on it over five years now. The book has two main aims. It's a philosophical book, motivating proof theory through questions of application. And it's

a logic book telling philosophers the kind of logic they need to know if they are interested in theories of meaning via proof theory—the logic book for people sympathetic to Michael Dummett or Robert Brandom, of explaining what we know about meaning using proof theories. In the book I present the proofs of theorems about normalization and cut elimination in an approachable way, while trying to highlight the philosophical aspects, explaining what all those theorems are for. The book is about 2/3 written.

ZW: Something you are known for these days is logical pluralism. What's that?

GW: Logical pluralism is the view that, just like there are two ways an argument can be good—either by being deductively valid or inductively strong—so logical pluralism says that 'deductively strong' itself isn't only one way an argument can be good. When you appeal to deductive validity, there is more than one thing you can mean.

ZW: So there isn't any one such thing as deductive validity, simpliciter?

GW: The term is either ambiguous or plural—in the same way as the word 'good'. You get more information about the distinction you are trying to draw depending on how specific you are. If you think of model theoretic validity and the emphasis there on counterexamples, for instance, then there are a number of different things that could count as a counterexample for different purposes, or for making the consequence relation precise. You could think that classical logic is a notion of deductive logical consequence of some kind. Or you could say that for an argument to be valid, warrant needs to be preserved in some stronger way, like the intuitionists say. A minority tradition says that a conclusion should not be *about* something that was not contained in the premises, that *meaning* should be preserved in some way. Relevant logic gets a better handle on that than others.

A logical pluralist says that these are just ways to drawing the line between a good and bad argument at a different places, respecting different features of arguments. Drawing the line at one place pays attention to verification, another to algorithms, another to meaning, and so on. These are all good notions of consequence, all telling us something about what an argument does or doesn't do, in the same way that knowing an argument is deductively invalid but inductively strong tells you something. There's no one notion of deductive validity that does everything people want it to do.

ZW: Your book [*Logical Pluralism*, Oxford University Press 2006, with co-author Jc Beall] is all in terms of models. How does proof theory relate to this idea of pluralism?

GR: That's an open question. When you look at different rules of inference, some will be good according to more than one notion of logical consequence, or maybe all notions, while other inferences are only good according to some notions of consequence. This does justice, for example, to mathematicians who say "look, this proof does not use the axiom of choice or any non-constructive methods; this is a good argument because it shows you more than you would see through mere classically validity." Now, all constructive consequence is classically valid, but not everything classically valid is constructively so. Through the proof theory, you can see weaker and stronger notions of validity.

ZW: Is there an invariant core—some small fragment of consequence that is valid under every conception?

GR: That's a very good question. I don't know. I find it hard to imagine what could go wrong in the argument from 'A and B' to 'A'. In the logical pluralism outlined in

our book, Jc and I think that identity (A implies A), and a few other principles, are always valid. I haven't found anything of use in even weaker notions of consequence, e.g., where identity fails, but maybe there is.

ZW: What's the future of pluralism? What are the obstacles?

GR: I was surprised at a recent conference in Dubrovnik. Pluralists are out there in force—of course, in different ways. For example, take second order logic. There are people who think it is good in some sense of 'logic' but not in others. So the future of pluralism hangs on an open question: *What is logic for*? Some think logic is primarily about laws of reasoning, and what you should do when you reason. Some think that logic is about necessary preservation of truth. I think there are many things logic is for, and each of these pull in different directions. Pluralism is hindered either by people not being clear on what logic is for, or else having a clear idea but thinking that is enough. Pluralism could run into trouble in the following way. One of these ways of thinking about logic might win and be the one called 'logic'. But that would just be how language works out, and a cheap way for logical monism to prevail.

ZW: Turning to more personal questions—how did you end up in logic?

GR: I started my undergraduate career as a mathematician. I had just done a couple of philosophy subjects, but I decided I liked logic more than anything else. And there was this new professor at the University of Queensland, Graham Priest, who got me very interested. I'd been interested in set theory and mathematical logic, and in some philosophical topics like modal logic, but Graham got me thinking very hard about the paradoxes of self-reference and non-classical solutions. It was seeing that someone could be both formally precise and philosophically outrageous at the same time—I thought, 'this is incredible!' During the first year of my PhD I read everything I could by Graham and fell in love with the work and then convinced myself it was all false.

ZW: All false? Your collaborator Jc Beall is a dialetheist—he, like Graham Priest, thinks contradictions can be true. You used to think so, too. Why not now?

GR: For a weird reason. The dialetheic solution to the paradoxes of self-reference isn't uniform enough. The treatment of Curry's paradox, in particular, points to gaps more than gluts. Curry's paradox uses a construction, '*A* implies absurdity', that is a kind of negation. But you can't be a dialetheist about 'implies absurdity' negation. A true contradiction with that negation would say, '*A*, and *A* implies absurdity.' And then by modus ponens, absurdity follows. Barring absurdity, then, what the dialethist says about one type of negation is very different than what can be said about the other. So I am still very interested in non-classical logics, but I don't think that dialetheism is the solution to the paradoxes.

ZW: Hmm. That's a different sort of answer to 'why aren't contradictions true?' than a lot of philosophers would give. It's about mathematical elegance. As someone who started in mathematics, how do you see the relationship between maths and philosophy?

GR: I was attracted to philosophy by the idea of being in a discipline where you can approach an issue at a bunch of different levels—the philosophical big picture, and the small, formal details. I like being able to move back and forth. When you get stuck on a technical problem you can step back and look at related philosophical issues. When the hand waving all gets too abstract you can reassure yourself that there really are some answers here though formal results. You don't do that when working only in mathematics.

When you go up to the big philosophical level, you're not being a mathematician—whereas you are still being a philosopher when working on the technicalities.

ZW: And finally: What's next for you?

GR: I want to work on logic and action, taking a proof theoretic perspective but applying it much more generally. Moving away from first-order mathematical logic to more general linguistic constructions—the great industries of Montague grammar and formal linguistics. I want to understand these topics with proof theory—and to make the formality, which is so useful, applied and connected down to what an individual person might say and do.

ZW: Greg, thanks again for talking with us.

GR: My pleasure. Let's eat. □

When Are Relations Neither True Nor False?

According to the logic of presuppositions, a sentence is neither true nor false if its subject class is empty. Strawson (1952: *Introduction to Logical Theory*, Methuen, pp. 163–179.) For example,

$$(x)(Fx \rightarrow \sim Gx) \tag{1.1}$$

or

$$(x)(Gx \rightarrow \sim Fx) \tag{1.2}$$

or

$$(x) \sim (Fx \,\&\, Gx) \tag{1.3}$$

are neither true nor false if

$$\sim(\mathrm{E}x)Fx \vee \sim(\mathrm{E}x)Gx. \tag{1.4}$$

We depart from Strawson by requiring both classes to be nonempty. ('Presuppositions And Truth Relevance', *The Reasoner* 3(11):6.) The following example from arithmetic,

$$(x)((2 > x > 4) \rightarrow \sim(x < x + 1)), \tag{1.5}$$

is neither true nor false as well.

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When are relations neither true nor false? For example, when is

$$(x)(y)\sim(Fxy \,\&\, Gxy) \tag{2.1}$$

neither true nor false? In classical logic

$$(x)(y)Axy \tag{2.2}$$

is interpreted as follows:

For all a_i in the range of x, it is the case that

$$(y)Aa_iy \tag{2.3}$$

and for all b_i in the range of y, it is the case that

$$(x)Axb_i. \tag{2.4}$$

When is 2.2 true in the logic of presuppositions? What if 2.3 is N for some a_i or if 2.4 is N for some b_i? ['N' stands for '$\sim$(T $\vee$ F)'.] We will simply 'count' only those $(y)Aa_iy$ and $(x)Axb_i$ that are either true or false. The meaning of 2.2 is then defined by the following procedure. Collect all the $(y)Aa_iy$ and $(x)Axb_i$ that are either true or false. If all of them are true then 2.2 is true, if one is false then 2.2 is false. If there is no such $(y)Aa_iy$ or $(x)Axb_i$ then 2.2 is N. For possible alternative valuations please see 'Quantification for The Logic of Presuppositions.'

In the example on Figure 1, there are some

$$(y)(Fa_iy \,\&\, Ga_iy) \tag{2.5}$$

that are T $\vee$ F. When $a = t$, then (Ey)Fay and (Ey)Gay. But there is no b_i in the range of y such that

$$(x)(Fxb_i \,\&\, Gxb_i) \tag{2.6}$$

is T $\vee$ F.

In summary, 2.1 will be T $\vee$ F iff there is an a_i such that

$$(\mathrm{E}y)Fa_iy \text{ and } (\mathrm{E}y)Ga_iy \tag{2.7}$$

and there is a b_i such that

$$(\mathrm{E}x)Fxb_i \text{ and } (\mathrm{E}x)Gxb_i \tag{2.8}$$

Thus it will be T $\vee$ F iff

$$\begin{array}{l}(\mathrm{E}x)((\mathrm{E}y)Fxy \,\&\, (\mathrm{E}y)Gxy)\& \\ (\mathrm{E}y)((\mathrm{E}x)Fxy \,\&\, (\mathrm{E}x)Gxy).\end{array} \tag{2.9}$$

This means that 2.1 will be T $\vee$ F iff F and G overlap along both axes. ('Quantification', p. 5.) Figure 1 shows the case when 2.1 is $\sim$(T $\vee$ F). Figure 2 shows the case when 2.1 is true. Finally, Figure 3 shows the case when 2.1 is false. The asterisk means both F and G.

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Let us now study a special case:

$$\sim(\mathrm{E}x)(\mathrm{E}y)(Fxy \,\&\, Gy), \tag{3.1}$$

such that only one $y = m$ satisfies Gy. For example let 'Gy' be '$y = m$':

$$\sim(\mathrm{E}x)(\mathrm{E}y)(Fxy \,\&\, (y = m)). \tag{3.2}$$

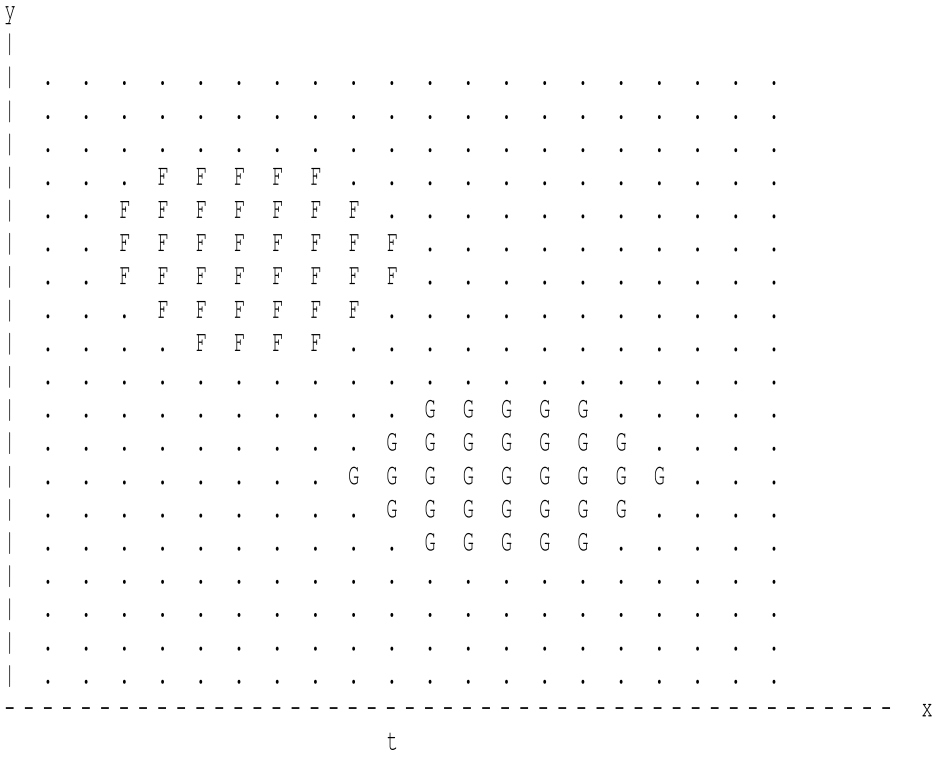

Figure 1:

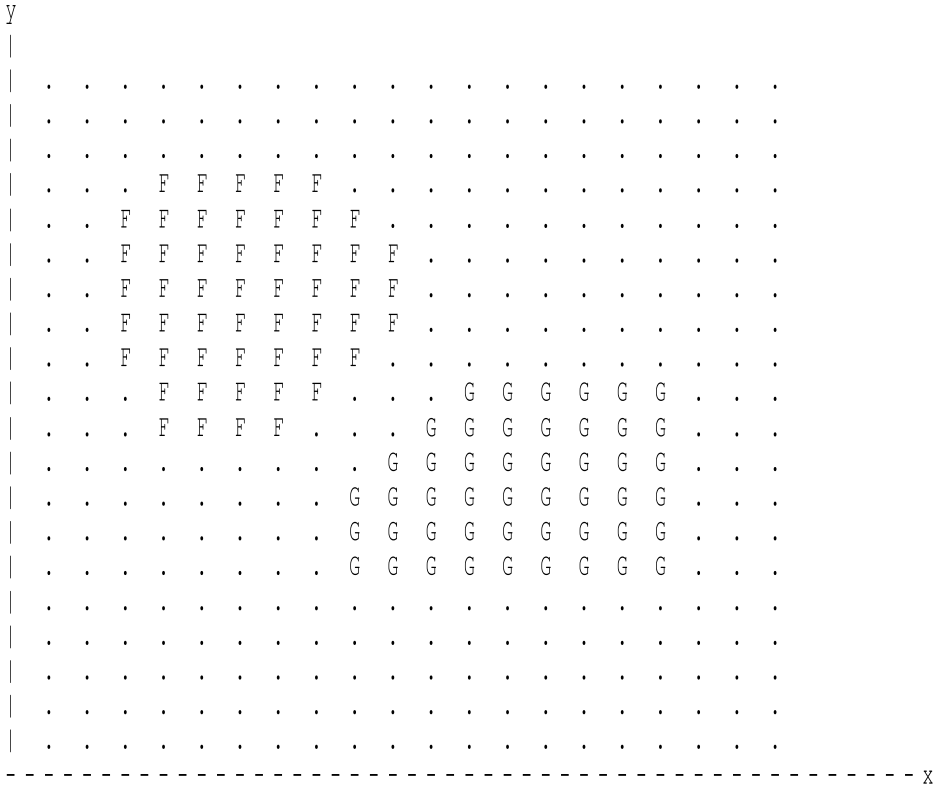

Figure 2:

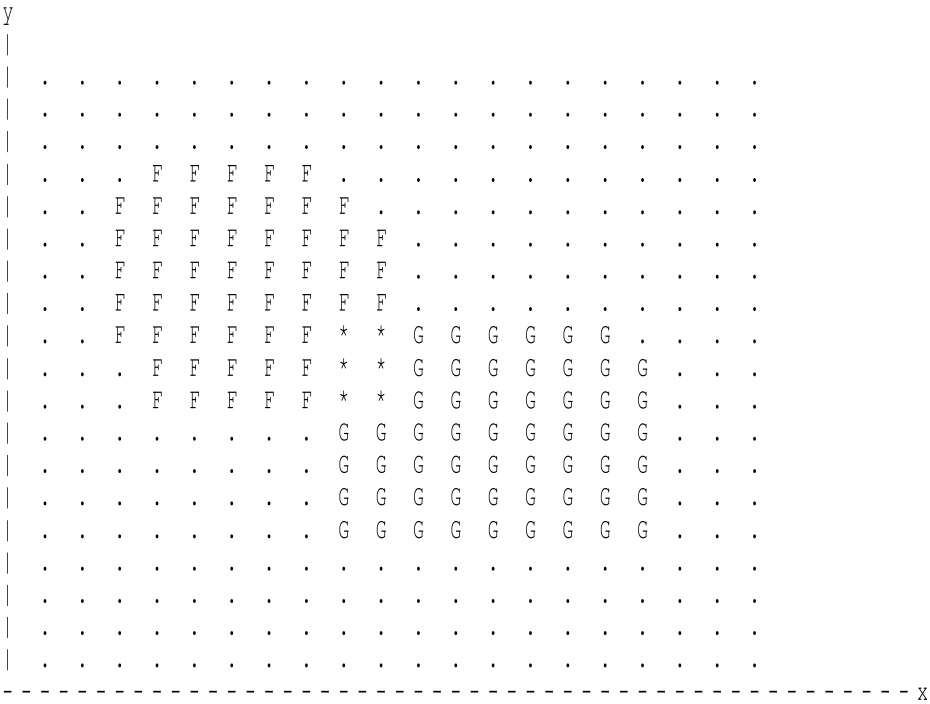

Figure 3:

There is no 'x' at 'G', but we can imagine that 3.2 is expressed as

$$\sim(\mathrm{E}x)(\mathrm{E}y)[Fxy \,\&\, ((y = m) \,\&\, (x = x))]. \tag{3.3}$$

The situation is depicted in Figures 4 and 5. Here there are only two cases. Either the two regions overlap (Figure 4) or they do not (Figure 5). 3.1 can be either false or neither true nor false; it can never be true. In the case of 2.1 when the two regions did not overlap, there were two further subcases: either the formula was true (Figure 2) or neither true nor false (Figure 1).

It is apparent that 3.1 will be $\sim(\mathrm{T} \vee \mathrm{F})$ iff

$$\sim(\mathrm{E}x)Fxm \tag{3.4}$$

is true. In this case the two regions will not overlap. (Figure 5).

Let our domain be the set of natural numbers. Then

$$\sim(\mathrm{E}x)(\mathrm{E}y)[(x + y < 6) \,\&\, (y = 8)] \tag{3.5}$$

is $\sim(\mathrm{T} \vee \mathrm{F})$. (Figure 6) This is so because the two regions do not overlap along the x axis.

Let us pick $y = 8$:

$$\sim(\mathrm{E}x)[(x + 8 < 6) \,\&\, (8 = 8)] \tag{3.6}$$

We observe that

$$\sim(\mathrm{E}x)(x + 8 < 6). \tag{3.7}$$

That is, 3.6 is $\sim(\mathrm{T} \vee \mathrm{F})$ analogously to 1.3; our logic is not classical. Let us pick, say, $y = 4$:

$$\sim(\mathrm{E}x)[(x + 4 < 6) \,\&\, (4 = 8)] \tag{3.8}$$

We observe that

$$\sim(\mathrm{E}x)(4 = 8). \tag{3.9}$$

That is, 3.8 is $\sim(\mathrm{T} \vee \mathrm{F})$. It is apparent that for any choice of y, the corresponding sentence will be $\sim(\mathrm{T} \vee \mathrm{F})$, hence 3.5 is $\sim(\mathrm{T} \vee \mathrm{F})$. Nevertheless

$$\sim(\mathrm{E}x)(x + 8 < 6) \tag{3.10}$$

is true. **In the logic of presuppositions, 3.5 and 3.10 are *not* equivalent.**

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Gödel's sentence has the same form as 3.1:

$$\sim(\mathrm{E}x)(\mathrm{E}y)(Pxy \,\&\, Qy). \tag{4.1}$$

Pxy means that x is the proof of y, where x and y are Gödel numbers of wffs or sequences of wffs. Q has been constructed such that only one $y = m$ satisfies it, and m is the Gödel number of 4.1.

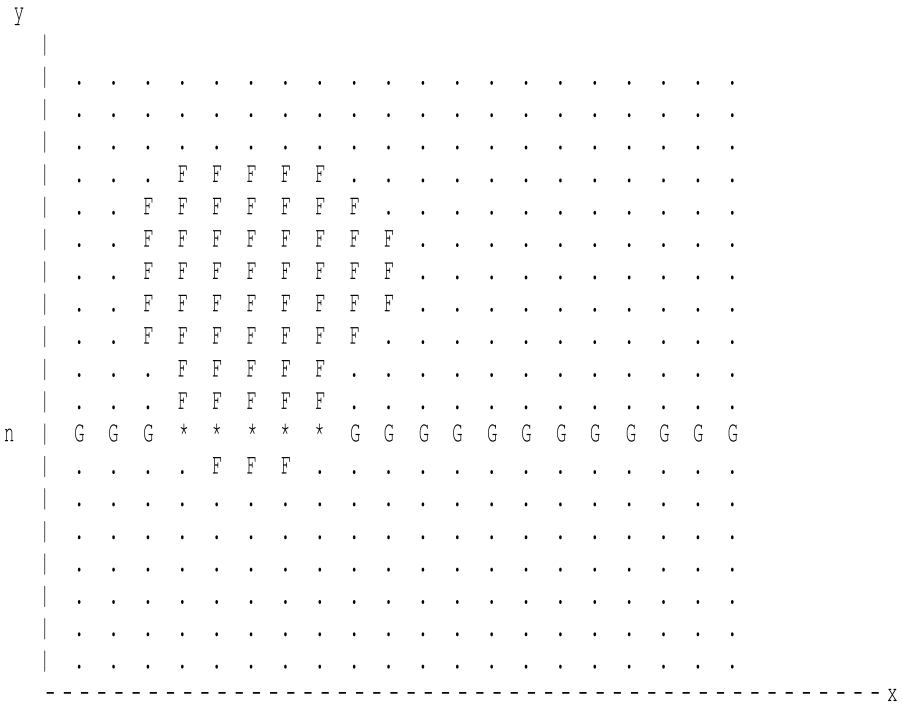

Figure 4:

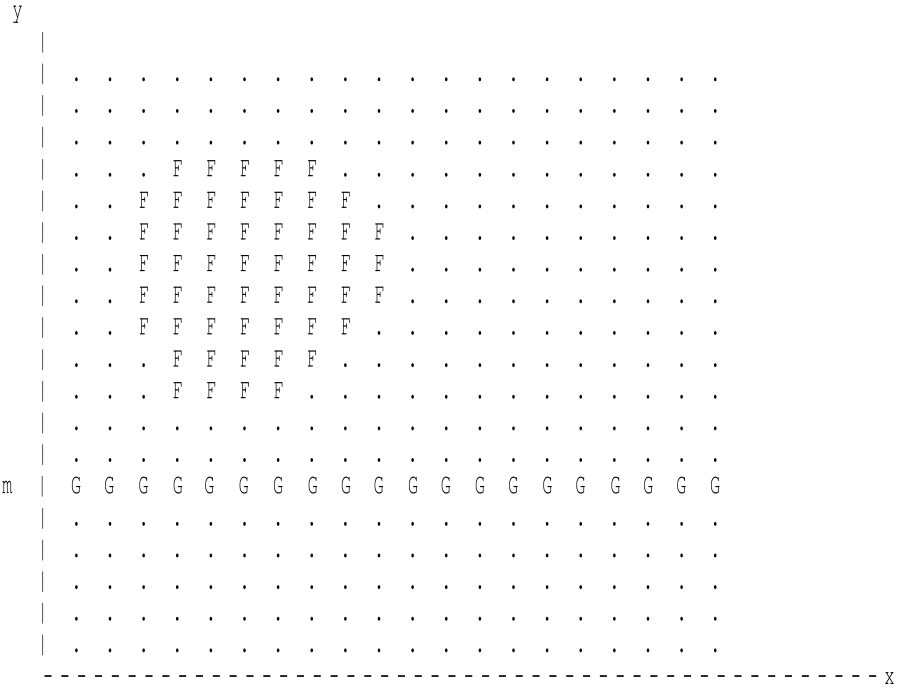

Figure 5:

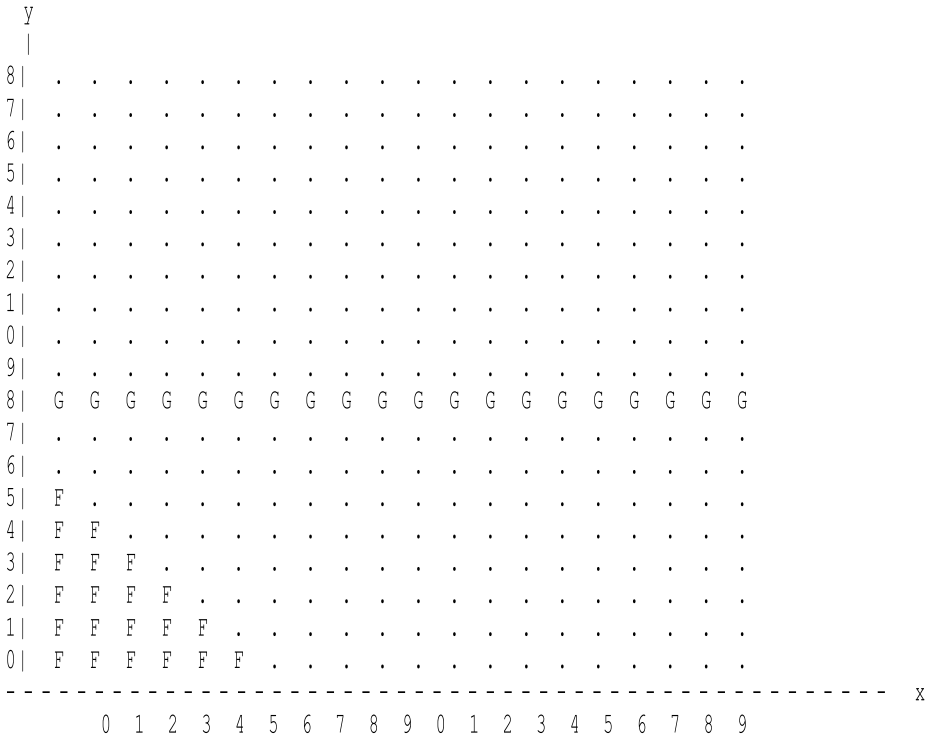

Figure 6:

Assume that Gödel's sentence 4.1 is *not* derivable—that

$$\sim(\mathrm{E}x)Pxm \tag{4.2}$$

is true. Then 4.1 is ∼(T ∨ F). Thus, if Gödel's sentence is not derivable it is neither true nor false.

Let there be a hypothetical derivation system S that derives only the true sentences in Strawson's sense. E.g., it does *not* derive 1.5, 3.5 or their negations. System S has gaps. It does not derive any of the 'vacuously true' formulae of classical logic as indeed the logic of presuppositions does not regard these as true. The equivalent of Gödel's sentence in the hypothetical System S would be

$$\sim(\mathrm{E}x)(\mathrm{E}y)(P'xy \,\&\, Q'y). \tag{4.3}$$

The presupposition of 4.3 is

$$(\mathrm{E}x)P'xm'. \tag{4.4}$$

Let's now use our imagination and suppose that

$$\sim(\mathrm{E}x)P'xm' \tag{4.5}$$

is provable in S. 4.5 does two things: It asserts that 4.3 is unprovable, and it denies a presupposition of 4.3. But then 4.3 is neither true nor false. It is not surprising that it is not provable! Note the close similarity of this outcome with Gaifman/Goldstein's solution of the Liar paradox. 'Notes on Gaifman's Solution of the Liar Paradox' (*The Reasoner* 4(2):22.)

X.Y. Newberry

Analytic Pragmatism and Religious Beliefs

In a previous contribution (*The Reasoner*, 4(3)) I advanced some remarks on the kind of "logical functionalism" introduced by Bob Brandom starting from some Fregean issues. Some formal aspects of human reasoning, as Brandom shows in the second chapter of *Between Saying and Doing* (2008: Oxford University Press), can be elaborated by a Turing Machine (TM), namely by a machine that simulates human reasoning. But what can't be elaborated either by a TM or by logic is the content of beliefs (the Fregean thoughts). The result is the fact that the Brandomian notion of inference based on the primacy of conditionals such as "If P (premise) then Q (conclusion)" does not completely grasp the sense or cognitive content of human beliefs. I would like to present an example of the impossibility of elaborating the content of beliefs. It concerns religious beliefs (Brandom himself considers religious vocabulary).

First, I explain the phenomenon of "Bootstrapping" in the pragmatic context, which shows how from basic practices described by a "metavocabulary" new practices and abilities characterized by a new vocabulary emerge. Second, I isolate the aspects of practices and vocabularies that can be elaborated by a TM and third, I clarify why human

beliefs can't completely be elaborated either by Artificial Intelligence or by logic as they have peculiar contents. Let's begin with the phenomenon of bootstrapping in Brandom's analytic pragmatism:

> (...) pragmatic metavocabularies exist that differ significantly in their expressive power from the vocabularies for the deployment of which they specify sufficient practices-or-abilities. I will call that phenomenon "pragmatic expressive bootstrapping" (Brandom, 2008, p. 11).

A first example of bootstrapping is exemplified by the abilities of transducing automata to elaborate primitive practices-or-abilities into more complex ones. I refer to this argument to show that a TM can elaborate the pattern characteristic of a certain practice (such as a religious ritual). Nevertheless, religious beliefs entail more than this elaboration. Just to give a brief idea, Brandom distinguishes between single-state transducing automata (SSTA), final-state transducing automata (FSTA) and push-down automata (PDA) to show some idealizations about pragmatically mediated syntactic relations and pragmatically mediated semantic relations.

SSTA generalize the primitive reading-and-writing abilities, i.e., discriminating stimuli of any kind, on the input side, and differentially responding in any way, on the output side. This model is similar to behaviorism, which provides a VP-sufficient vocabulary to explain some basic abilities such as riding a bike or toeing the party line. FSTA are more flexible because besides responding differentially to stimuli by producing performances from their responsive repertoire can respond differentially by changing state. This process is an advance from behaviorism to functionalism in the philosophy of mind that corresponds to the move from a single-state to a multi-state model. Lastly, PDA are a kind of automata (for instance a TM) that elaborate information according to implemented rules and so they seem to simulate humans' semantic abilities. Let's refer to the diagram in figure 2 (Brandom 2008, p. 40).

In this case we have three vocabularies: V_1 emerges from basic practices [(P_1) that give rise to new practices (P_2)], V_2 characterizes V_1, i.e., is a syntactic or semantic metavocabulary, and V_3 specifies what the system is doing according to certain rules.

The impossibility of computationally elaborating the content of beliefs is evident in the case of religious beliefs. Following the diagram presented above, we can describe the aspects of religious practices that could be elaborated by a TM. This is the "mechanical" process like a sort of "rule following" that characterizes rituals belonging to certain religious practices that possess a certain vocabulary. In this case we have three vocabularies: V_1 emerges from basic practices (performance of rituals), V_2 characterizes V_1, i.e., is a syntactic or semantic metavocabulary (describes what we are doing in the performance of certain rituals), and V_3 specifies what the system is doing according to certain rules (specifies the rules that govern the performance of rituals). Obviously, the result is that what we can elaborate is a procedure that does not grasp the "content" of religious beliefs: this is because the latter is embedded in a 'Background of capacities and abilities' and a 'Network of beliefs' (to use the Searlean notions), which are not captured by the mechanical process.

The second point of my argumentation concerns the impossibility of the logical elaboration of the content of religious beliefs. The practices that can be elaborated by

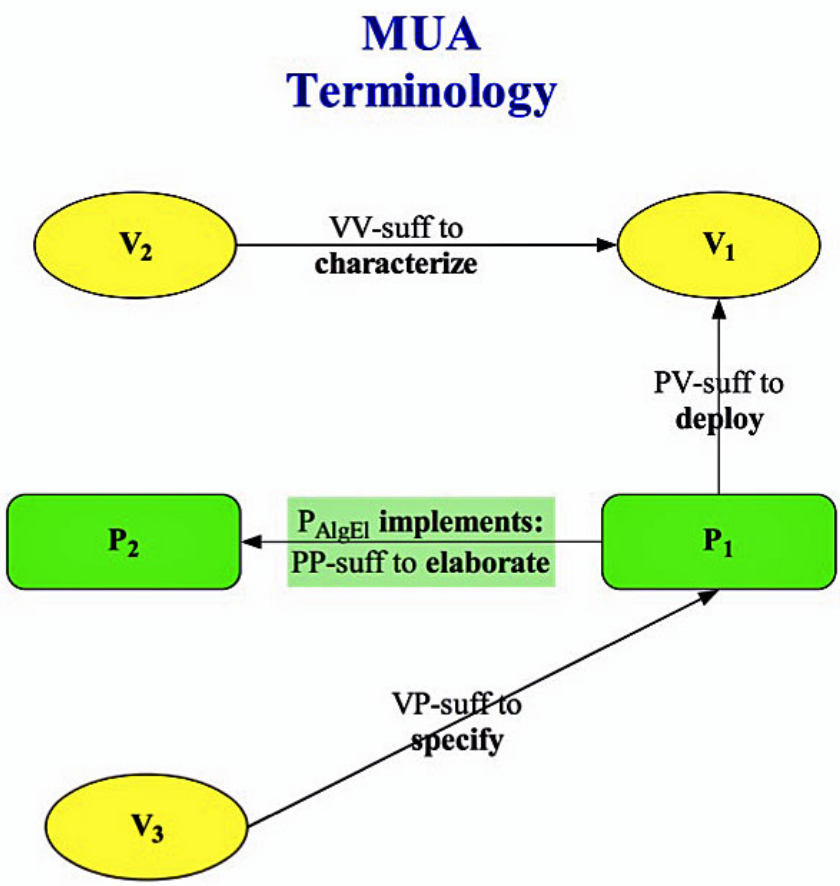

Figure 7: Brandom's vocabularies

a TM are sufficient, i.e,. PP-sufficient to deploy a particular vocabulary (in our case the vocabulary that characterizes a certain religious ritual). Now we can ask: are there any practical abilities that are *universally* PV-necessary? In Brandom's terms:

> [...] inferential practices are PP-necessary components of every autonomous discursive practice, hence PV-necessary for the deployment of every autonomous vocabulary, hence PV-necessary for the deployment of every vocabulary whatsoever. They are universally PV-necessary (Brandom, 2008, p. 41).

This thesis implies that inferential practices are necessary to deploy every vocabulary we use in our ordinary life. They represent conceptual abilities that, according to Brandom, can't be elaborated by a TM. Could we elaborate religious practices and vocabulary from a "logical" point of view using inferential processes as proposed by Brandom? In this case we ought to follow conditionals governed by material inference such as "If Vic is a dog then Vic is a mammal" or "If this ball is red then it is not green". The validity of a material inference is given by the correct use of concepts such as "dog" and "mammal" not just by the use of the logical form "If ... then ...". An example of a conditional applied to religious practice is "if you are a good Christian then you ought to go to Mass". It entails a material inference embedded in a social norm like the inferential pattern "If I am a bank employee I ought to wear a necktie" (because "Bank employees are obliged [required] to wear neckties" is a social norm). If we want to consider what we do in social and discursive practices, since we are not "avatars" participating in a kind of idealized "linguistic game", we'd better consider the different levels of judgment.

Brandom does not grasp the cognitive sense of religious beliefs. This very content needs a sort of consideration of the level of thoughts that according to Frege belong to a third realm (though they are "graspable"). Thoughts are true or false, they exist but they are not graspable by means of material inferences. Expressions of thoughts such as "Christ is immortal" or "Christ is not immortal" are simple demonstrations of the impossibility of their logical elaboration.

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§3
News

The Peirce Edition Project

The Peirce Edition Project (ed.). 2010. *Writings of Charles S. Peirce: A Chronological Edition* (18901892), vol. 8, Indiana University Press.

This volume collects Peirce's philosophical, mathematical, and logical work between 1890 and 1892. Of interest to readers of *The Reasoner* are essays on Boolian

Algebra (sels. 15, 17, 18), the algebra of the copula (sels. 31–35), a review of Jevon's *Pure Logic* (sel. 7), and correspondence and a lesson on the art of reasoning (sels. 1, 42). These works represent Peirce's contribution to the development of propositional and predicate calculus between his 1880 and 1885 essays on the algebra of logic and his 1894 "Grand Logic". They are particularly noteworthy insofar as they indicate Peirce's perspective on the difference between formal and natural languages, the notion of the copula, the diagrammatic function of logic, and the application of the predicate calculus to the the study of numbers and collections.

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Philosophy Department, The Pennsylvania State University

Propositions, Context, and Consequence, 20–21 March

FLC, The Foundations of Logical Consequence, is an AHRC-funded project run by the Arché Research Centre in the University of St Andrews. The four year project is currently in its second phase, The Structure of Logical Consequence. As part of the regular activity, FLC has just hosted its third workshop, entitled *Propositions, Context, and Consequence*.

Logical consequence has long been understood as a relation, but what are the relata: sentences, propositions, utterances, or what? If we say that the relata are utterances, then issues of context and context-sensitive devices like demonstratives and tenses may bear on the correct definition of logical consequence. How are such phenomena to be systematically integrated into the theory of logical consequence, and what is the impact of such considerations? The workshop brought together international experts on these and other topics.

The first day started with Hartley Slater (Western Australia) who discussed the use of formal languages. He argued that the method of artificially regimenting the language can lead to confusion about the sentence/proposition distinction which obscures matters when it comes to indexicality and self-reference. Francesco Berto (Aberdeen) led us through a discussion of impossible propositions. He argued that a hybrid framework of Lewisian modal realism about possible worlds with ersatzism about impossible worlds handles potential objections to impossible propositions. Next up, Elia Zardini (Aberdeen) made an ambitious plea for a generalised Kaplanian semantics for context-sensitive devices which underwrites a concept of logical consequence for cross-contextual inferences which he calls 'yielding'. In this way it can be shown that 'Today I am happy' uttered by me today yields 'Yesterday I was happy' uttered by me tomorrow. The last talk of the day was Martin Pleitz (Münster) on the metaphysics of sentences. He argued that we can eliminate Liar sentences from our language, as Tarski proposed, but that this requires less sweeping revisions than Tarski proposed, namely that the reference relation is well-founded.

Catarina Dutilh Novaes (ILLC, Amsterdam) started the second day by drawing connections between Medieval discussions of inference in context and recent work in cognitive science which shows that human reasoning is typically context-dependent. Walter

Pedriali (Aberdeen) discussed the prospects for responding to the challenge posed by radical contextualism to such assumptions as that, e.g., context-sensitive components of natural language can always be parametrized, or that cases of underdetermination of content can always be made fully perspicuous. Isidora Stojanovic (Institut Jean-Nicod, Paris) tried to clarify what makes a semantic framework relativist rather than contextualist. She argued that relativist semantics is to be preferred on the methodological ground that it does not conflate genuinely semantic issues with issues pertaining to the use of language. The last talk was given by Stewart Shapiro (Ohio State) on logical eclecticism. He argued that in mathematics, logic is relative to structure and that there is nothing illegitimate about structures that invoke various non-classical logics. He went so far as to suggest that answers to the question "what are the relata of the logical consequence relation?" are largely an interest-relative matter.

The workshop had about 35 participants. We hope they share our opinion that the event created significant impetus to future work on the role of propositions and context-sensitivity in accounts of logical consequence. If there was one conclusion to take away from the workshop as a whole, it was that there is great potential for work on propositions and context to inform debates about semantic paradox, logicality, and the revision of logic.

More information about Arché and FLC events can be found here.

Colin Caret
Arché Research Centre, University of St. Andrews

Calls for Papers

Advances and Perspectives in the Mechanization of Mathematics: special issue of *Mathematical Structures in Computer Science*, deadline 28 June.
Final Causes and Teleological Explanations: special issue of *Logical Analysis and History of Philosophy*, deadline 30th June.
Joint Action: What is Shared?: special issue of the *Review of Philosophy and Psychology*, deadline 15 August.
Philosophical Explorations Essay Prize: on all aspects of the philosophy of mind and action, deadline 30 August.
Biological and Economic Modelling: special issue of *Biology and Philosophy*, deadline 31 August.
Logic and Natural Language: special issue of *Studia Logica*, deadline 3 September.
The Extended Mind: special issue of *Teorema*, deadline 1 October.
AILACT Essay Prize: in Informal Logic / Critical Thinking / Argumentation Theory, with publication on *Informal Logic*, deadline 31 October.
Philosophical History of Science: special issue of *The Monist*, deadline 31 October.
Experimental Philosophy: special issue of *The Monist*, deadline 30 April 2011.
Formal and Intentional Semantics: special issue of *The Monist*, deadline 30 April 2012.

§4
What's Hot in ...

We are looking for columnists willing to write pieces of 100-1000 words on what's hot in particular areas of research related to reasoning, inference or method, broadly construed (e.g., Bayesian statistical inference, legal reasoning, scientific methodology). Columns should alert readers to one or two topics in the particular area that are hot that month (featuring in blog discussion, new publications, conferences etc.). If you wish to write a "What's hot in ...?" column, either on a monthly or a one-off basis, just send an email to features@thereasoner.org with a sample first column.

...Logic and Rational Interaction

The last two months have been a bit quiet in terms of workshop reports and publication announcements but, still, there's always some news to follow on *loriweb.org*!

Pietro Galliani wrote an extensive report of the workshop *Modelling Interaction, Dialog, Social Choice, and Vagueness* held at the University of Amsterdam at the end of March 2010. Also, as follow-up to the *Strategy Day*, held at CWI in Amsterdam also in March, we were glad to publicize Ram Ramanujam and Jan van Eijck's *list of interesting questions* about logic and strategies.

As for new publications in the area of Logic and Rational Interaction, *two new papers* appeared the Journal of Artificial Intelligence Research, one by W. van der Hoek, D. Walther & M. Wooldridge and the other by Ivan José Varzinczak, and Sergei Artemov put online the result of his recent *logical investigations into solutions concepts for games*.

If you attend an interesting workshop, organize one, or publish a paper relevant to the LORI community, please do not hesitate to pass the information to our team. You can always contact Rasmus Rendsvig, our web manager or use our gmail address: `loriweb.mail@gmail.com)`.

Olivier Roy
Philosophy, Groningen

...Formal Epistemology

What's hot (and what's not) in formal epistemology. Handy tips and helpful advice from the Formal Philosophy Seminar series at the Formal Epistemology Project, University of Leuven.

Ralf Busse argued that although the two doctrines of Innocent Mereology (IM) and Pleonastic Properties (PP) might at first sight look rather similar, IM and PP are not so similar after all. IM (which is defended by D. Lewis, Th. Sider and others) is the view that when one has already committed oneself to the existence of certain things, then on can simply infer that there also exists the (classical) fusion of these things, without this involving any substantial further ontological commitment. PP (which has

been developed by St. Schiffer) is the view that when one has already asserted that some object a is F, one can simply infer that there is a property, viz. F-ness, which object a has, without this involving any substantial further ontological commitment. Busse argued that in fact, IM is true, while PP is false, provided that the quantifier "there is" in the conclusion "There is a property . . . " is construed as substantially ontological.

Klaus Oberauer with his "The Meaning of Conditionals" demonstrated that two broad classes of theories of the meaning of conditionals make different predictions for how people estimate the probability of conditional statements. Theories building on a truth-functional interpretation of conditionals predict that the probability of the conditional equals the sum of the probabilities of the truth-table cases that are represented as rendering the conditional true, or of a subset of these cases that is explicitly represented. In contrast, probabilistic theories of conditionals predict that the probability of conditionals is evaluated to the conditional probability of the consequent, given the antecedent. Experiments show that the majority of participants respond in accordance with the prediction of the probabilistic view, whereas a minority evaluates the probability of the conditional such that it correlates with the probability of a conjunction of the antecedent with the consequent. These results support the probabilistic view.

A challenge for this view is to explain the intimate relationship between "if-then" statements and corresponding statements with "all": The latter seem to have well-defined truth conditions whereas the former, according to the probabilistic view, don't. To address this challenge, Oberauer proposed a theory of the meaning of conditionals and of "all"-statements based on the following assumptions: (1) Conditionals have truth conditions after all, they are true iff the consequent is true in all relevant possible cases of the antecedent. Different theories of conditionals can be understood as differing in how they define the "relevant possible case of antecedents". (2) The truth conditions of "if" and "all" statements depend on whether they are meant to apply to a single case, to a finite set of cases, or to an infinite set of possible cases (i.e. universal laws), and whether they generalize beyond a single case accidentally or for a systematic reason. Oberauer then presented two new experiments that provided partial support for this proposal.

Martin van Hees, in joint work with Matthew Braham, presented An Anatomy of Moral Responsibiliy: Some General Results on Outcome Responsibilities. By applying conditions on harm-avoidance acquired from game-theoretical considerations, they generated the principle that "If it is in our power to sever the causal ties between our behaviour and bad states of affairs, without thereby sacrificing anything of comparable moral importance, we ought, morally, to do it".

Nick Shackel spoke to us on Objective Bayesianism, the Maximum Entropy Principle (MEP), and Bertrand's Paradox. Shackel argued that there were serious difficulties standing in the way of MEP, and therefore serious difficulties standing in the way of Objective Bayesianism. Shackel mounted serious arguments to demonstrate that MEP is no better motivated than the Principle of Indifference, since they are both motivated by the same epistemic principle—that one should be maximally non-commital with regard to missing information. Also, although MEP is superior due to it being a more general formalisation of this principle, MEP is unlikely to solve Bertrand's Paradox. Hence, finally, Objective Bayesianism has not evaded the problem taken to defeat logical probability, hence logical probability remains a live option.

Guy Politzer presented Solving Natural Categorical Syllogisms. Politzer argued that natural syllogisms are expressed in terms of classes and properties of the real world, usually of daily life. They also exploit a categorisation present in semantic memory that provides a class inclusion structure. What is more, Politzer also demonstrated good reasons for supposing that natural syllogisms are enthymematic (the class inclusion of the minor premise is implicit), that they typically occur within a dialogue, and that they have a form identical to a formal syllogism once the minor premise has been made explicit. Politzer also made some psychological conclusions, backed by empirical data: natural syllogisms are solved by exposition, which is primed by the class inclusion structure.

Next month, Murali Ramachandran, Alan Hajek, and Jon Williamson.

Photos of our fun may be found here.

The full FPS programme is available here.

Sebastian Sequoiah-Grayson
Formal Epistemology Project, University of Leuven

§5
Introducing . . .

In this section we introduce a selection of key terms, texts and authors connected with reasoning. Entries will be collected in a volume *Key Terms in Logic*, to be published by Continuum.

Call for contributions

We are pleased to say that the volume *Key Terms in Logic* is now in press and will be available soon. If you have an editorial project and would like to contribute to this section with short pieces about the chapters or sections of the volume in preparation please email features@thereasoner.org with your proposal.

Necessity

Necessity is usually said to apply to statements or propositions. A necessary proposition cannot fail to be true, has to be true, or, in the language of possible worlds, is true at/in all possible worlds. Possibility is the dual of necessity: to be possible is to be true at some possible world. Although necessity and the a priori have been traditionally conceived as being intimately related, the prevalent, modern, Kripkean understanding of necessity strongly insists on the distinction between the two: necessity involves ontological or metaphysical matters only, whereas the a priori involves strictly epistemological ones: something is a priori if and only if it can be known independently of experience. Hence, in this modern reading, necessity and the a priori do not always coincide, something

may be necessary without being a priori, and vice versa. Identity statements are typical examples of the necessary a posteriori: water is H_2O, necessarily, but this is only known a posteriori.

Examples of a priori statements that are not necessary (contingent a priori) are harder to come by and, as a general rule, more controversial. Most exploit rigid designators, such as Kripke's example of "The standard meter measures one meter". The proper name "standard meter" denotes the same platinum rod in every possible world even though the accidental features of this rod may vary from one world to another. Therefore the standard meter does not necessarily measure one meter. However, it is argued that knowledge of the fact that the standard meter measures one meter is a priori. Modal logic was initially developed to formally characterise necessity. As such, the axioms of modal logic have a natural "necessity" reading, e.g., axiom T is usually interpreted as meaning that the actual world is possible. The predominant modal logic for necessity is S5.

Neil Kennedy
Philosophy, University of Quebec in Montreal & Paris I

Gottlob Frege

Gottlob Frege (1848–1925) was a German mathematician, logician and philosopher whose invention of quantificational theory inaugurated modern logic, and who—together with Bertrand Russell, G. E. Moore and Ludwig Wittgenstein—was one of the main founders of analytic philosophy. Born in Wismar in northern Germany, he studied mathematics, physics, chemistry and philosophy at the Universities of Jena and Göttingen from 1869 to 1873, and taught mathematics at Jena from 1874 until he retired in 1918.

The three books that he published in his lifetime were *Begriffsschrift* (Conceptual Notation) in 1879, *Die Grundlagen der Arithmetik* (The Foundations of Arithmetic) in 1884, and *Grundgesetze der Arithmetik* (Basic Laws of Arithmetic), the first volume of which appeared in 1893 and the second volume in 1903. Frege's main aim in these books was to demonstrate the logicist thesis that arithmetic is reducible to logic. In *Begriffsschrift* he gave his first exposition of the logical system by means of which arithmetic was to be reduced. In *Grundlagen* he offered an informal account of his logicist project, criticising other views about arithmetic, such as those of Kant and Mill. In *Grundgesetze* he refined his logical system and attempted to demonstrate formally his logicist thesis. In 1902, however, as the second volume was going to press, he received a letter from Bertrand Russell informing him of a contradiction in his system—the contradiction we know now as Russell's paradox. Although Frege hastily wrote an appendix attempting to respond to the paradox, he soon realised that the response did not work, and was led to abandon his logicist project. He continued to develop his philosophical ideas, however, and to correspond with other mathematicians and philosophers, and published a number of influential papers.

The central idea of Frege's logicism is the claim that a number statement involves

an assertion about a concept. To say that Jupiter has four moons, for example, is to say that the concept *moon of Jupiter* has four instances, something that can be defined purely logically. The significance of this idea comes out when we consider negative existential statements (a type of number statement, involving the number 0), such as "Unicorns do not exist". We might be tempted to construe this as attributing to unicorns the property of non-existence. But if there are no unicorns, then how is this possible? On Frege's view, however, the statement is to be interpreted as "The concept *unicorn* has no instances", which makes clear that there is no mysterious reference to unicorns themselves, only to the *concept* of a unicorn. The general strategy here, reformulating a potentially misleading proposition to reveal its "real" logical form, was to become a central idea of analytic philosophy.

Besides his books, Frege is best known for three papers he wrote in the early 1890s, "Function and Concept", "On Sense and Reference" and "On Concept and Object", and a series of three papers he published under the general title of "Logical Investigations" in 1918—23, of which the most famous is "Thought". In the first set of papers Frege outlines the main ideas that informed the development of his logical system–his use of function-argument analysis, the doctrine that concepts are functions that map objects (as arguments) onto truth-values, the distinction between concept and object, and the distinction between sense (*Sinn*) and reference (*Bedeutung*). The latter is the most well-known of all Frege's ideas, introduced in order to explain how identity statements can be both correct and informative. According to Frege, an identity statement such as "The morning star is the evening star" is correct because the two names "the morning star" and "the evening star" have the same reference, namely, the planet Venus, and informative because the two names nevertheless have different senses—reflecting the different ways in which Venus is presented (as seen in the morning and as seen in the evening). In Frege's later paper "The Thought", he develops his ideas further, explaining how "thoughts" (as the senses of sentences) can be regarded as inhabiting a "third realm" distinct from both the physical and the mental realms.

Frege's ideas had a huge influence on Russell and Wittgenstein, and through them on the development of analytic philosophy, especially in the areas of philosophy of language, logic and mind. In recent years, even Frege's philosophy of mathematics has been given a new lease of life by so-called neo-logicists, who have attempted to bypass the problems caused by Russell's paradox. Frege's ideas are more vigorously debated now than at any point in the past.

Mike Beaney
Philosophy, University of York

§6
Events

June

Philosophy and Model Theory: History and Contemporary Developments, Philosophical Issues and Applications, Paris, 2–5 June.
BLAST: Boolean Algebras, Lattices, Algebra, Set Theory, and Topology, Boulder, Colorado, 2–6 June.
Cognitive Ecology: The Role of the Concept of Knowledge in our Social Cognitive Ecology: Episteme Conference, University of Edinburgh, 3–4 June.
Truth and Relativism: Dpartment of Philosophy, University of Turin (3–4 June) and Scuola Superiore Studi Umanistici, University of Bologna (5–6 June), 3–6 June.
Valencia International Meetings on Bayesian Statistics: Benidorm, Spain, 3–8 June.
Norms of Assertion: University of Geneva, 4 June.
ICIC: 3rd International Conference on Information and Computing Science, Jiangnan University, Wuxi, China, 4–6 June.
ICMS: 3rd International Conference on Modelling and Simulation, Jiangnan University, Wuxi, China, 4–6 June.
Modern Formalisms for Pre-Modern Indian Logic and Epistemology: Hamburg, 4–6 June.
IIS: Intelligent Information Systems, Siedlce, Poland, 8–10 June.
DGL: 4rth Workshop in Decisions, Games & Logic, Paris, France, 9–11 June.
Self-Knowledge and Rational Agency: CSMN, University of Oslo, 9–11 June.
Society for Philosophy and Psychology: 36th Annual Meeting, Lewis & Clark College, Portland, Oregon, 9–12 June.
WOC: Workshop on Context, Genoa, Italy, 11–12 June.
ICCSS: IEEE International Conference on Computational and Statistical Science, Manila, Philippines, 11–13 June.

ICDDM: IEEE International Conference on Database and Data Mining, Manila, Philippines, 11–13 June.
Foundations of Logical Consequence: Arché Research Centre, The University of St Andrews, 11–15 June.
What's Truth Got To Do With It?: University of East Anglia, 12 June.
ICAISC: 10th International Conference on Artificial Intelligence and Soft Computing, Zakopane, Poland, 13–17 June.
DM: SIAM Conference on Discrete Mathematics, Hyatt Regency Austin, Austin, Texas, 14–17 June.
Philosophy of Consciousness: University of Birmingham, UK, 16 June.
Adjectives and Relative Clauses: Syntax and Semantics: Venice, 16–17 June.
Logic and Knowledge: Department of Philosophical and Epistemological Studies, University La Sapienza, Rome, 16–19 June.
Artifacts, Kinds and Knowledge. Issues on the Metaphysics and Epistemology of Artifacts: Universidad Autónoma de Madrid, Madrid, Spain, 17–18 June.
GandALF: 1st International Symposium on Games, Automata, Logics and Formal Verification, Minori, Amalfi coast, Italy, 17–18 June.
Objectivity in Science: University of British Columbia, 17–20 June.
Square of Opposition: Corte, Corsica, 17–20 June.
PCC: 9th Proof, Computation and Complexity, Bern, Switzerland, 18–19 June.
Varieties of Higher-Order Logic: Institute of Philosophy, London, 18–19 June.
From Practice to Results in Logic and Mathematics: Nancy, France, 21–23 June.
LCM: 4th International Conference on Language, Culture and Mind, Turku, Finland, 21–23 June.
MPC: 10th International Conference on Mathematics of Program Construction, Québec City, Canada, 21–23 June.
PAKDD: 14th Pacific-Asia Conference on Knowledge Discovery and Data Mining, Hyderabad, India, 21–24 June.
CCA: 7th International Conference on Computability and Complexity in Analysis, Zhenjiang, China, 21–25 June.
ICML: 27th International Conference on Machine Learning, Haifa, Israel, 21–25 June.
LOGICA: Hejnice, northern Bohemia, 21-25 June.
Human-Robot Personal Relationships: Leiden University, The Netherlands, 23–24 June.
HOPOS: International Society for the History of Philosophy of Science, Central European University, Budapest, Hungary, 24–27 June.
Mind, Science and Everything!: University of Glasgow, 25–26 June.
POP III: 3rd Graduate Conference in Philosophy of Probability, Centre for Philosophy of Natural and Social Science, London School of Economics, 25–26 June.
ILP: 20th International Conference on Inductive Logic Programming, Firenze, Italy, 27–30 June.
PALMYR: Logic and the Use of Language, Institute for Logic, Language and Computation, University of Amsterdam, 28–29 June.
What is HPS for?: 5th Joint Workshop on Integrated History and Philosophy of Science, University of Exeter, 28–29 June.

IPMU: 13th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems, Dortmund, Germany, 28 June - 2 July.
CiE: Computability in Europe: Programs, Proofs, Processes, Ponta Delgada (Azores), Portugal, 30 June - 4 July.

July

AAL: Australasian Association for Logic Conference, Sydney, Australia, 2–4 July.
Methods of Applied Philosophy: St Anne's College, Oxford, 2–4 July.
MAXENT: 30th International Workshop on Bayesian Inference and Maximun Entropy Methods in Science and Engineering, Chamonix, France, 4–9 July.
AISC: 10th International Conference on Artificial Intelligence and Symbolic Computation, CNAM, Paris, France, 5–6 July.
LOFT: 9th Conference on Logic and the Foundations of Game and Decision Theory, University of Toulouse, France, 5–7 July.
IWAP: 5th International Workshop on Applied Probability, Universidad Carlos III de Madrid, Colmenarejo, Madrid, Spain, 5–8 July.
IWSM: 25th International Workshop on Statistical Modelling, Department of Statistics, University of Glasgow, 5–9 July.
Conferences on Intelligent Computer Mathematics: Paris, France, 5–10 July.
INC: 8th International Network Conference, Heidelberg, Germany, 6–8 July 2010.
WoLLIC: 17th Workshop on Logic, Language, Information and Computation, Brasília, Brazil, 6–9 July.
Beyond Rationality: University of Mississippi, 7–9 July.
Deon: 10th Interational Conferene on Deontic Logic in Computer Science, Florence, 7–9 July.
ISPDC: 9th International Symposium on Parallel and Distributed Computing, Istanbul, Turkey, 7–9 July.
IPTA: International Conference on Image Processing Theory, Tools & Applications, Paris, France, 7–10 July.
GECCO: Genetic and Evolutionary Computation, Portland, Oregon, 7–11 July.
BSPS: British Society for the Philosophy of Science Annual Conference, University College, Dublin, 8–9 July.
UAI: 26th Conference on Uncertainty in Artificial Intelligence, Catalina Island, California, 8–11 July.
ICCSIT: 3rd IEEE International Conference on Computer Science and Information Technology, Chengdu, China, 9–11 July.
FLoC: 5th Federated Logic Conference, University of Edimburgh, 9–21 July.
Metaphysics and Epistemology in Chinese Philosophy: School of Philosophy, Renmin University of China, Beijing, China, 10–11 July.
IDTGT: Interactive Decision Theory and Game Theory, Atlanta, USA, 11–12 July.
LICS: Logic in Computer Science, Edinburgh, Scotland, UK, 11–14 July.

SCSC: 2010 Summer Computer Simulation Conference, Ottawa, ON, Canada, 11–14 July.
TMFCS: International Conference on Theoretical and Mathematical Foundations of Computer Science, Orlando, FL, USA, 12–14 July.
Uncertainty in Computer Models: Sheffield, UK, 12–14 July.
WORLDCOMP: World Congress in Computer Science, Computer Engineering, and Applied Computing, Las Vegas, Nevada, 12–15 July.
CBR-MD: International Workshop Case-Based Reasoning on Multimedia Data, Berlin, Germany, 14 July.
BICS: Brain-Inspired Cognitive Systems Conference, Madrid, Spain, 14–16 July.
WCCI: IEEE World Congress on Computational Intelligence, Barcelona, Spain, 18–23 July.
ICCBR: 18th International Conference on Case-Based Reasoning, Alessandria, Italy, 19–22 July.
WCCM/APCOM: 9th World Congress on Computational Mechanics and 4th Asian Pacific Congress on Computational Mechanics, Sydney, Australia, 19–23 July.
SIGIR: Feature Generation and Selection for Information Retrieval, Geneva, Switzerland, 23 July.
Structure and Identity: University of Bristol, 23–25 July.
NACAP: Simulations and Their Philosophical Implications, Carnegie Mellon University, 24–26 July.
KDD: 16th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, Washington, DC, 25–28 July.
Julian Jaynes Conference on Consciousness: Charlottetown, Canada, 29 July.
BWGT: Brazilian Workshop of the Game Theory Society, University of São Paulo, 29 July–4 August.
Philosophy, History, Sociology of Mathematics: UCL, London, 30 July.

August

FLINS: 9th International FLINS Conference on Foundations and Applications of Computational Intelligence, Chengdu (Emei), China, 2–4 August.
Thought in Science and Fiction: 12th International Conference of the International Society for the Study of European Ideas, Ankara, 2–6 August.
Metaphysics of Science Conference: Kyung Hee University, Seoul, South Korea, 3–5 August.
MSN-DS: 2nd International Workshop on Mining Social Network for Decision Support, Odense, Denmark, 9–11 August.
ICNC-FSKD: the 6th International Conference on Natural Computation and the 7th International Conference on Fuzzy Systems and Knowledge Discovery, Yantai, China, 10–12 August.
Compositional Connectionism in Cognitive Science II: The Localist / Distributed Dimension: Portland, Oregon, USA, 11 August.
ICCP: 10th International Conference on Philosophical Practice, Leusden, Netherlands, 11–14 August.

Making Decisions: Singapore Multidisciplinary Decision Science Symposium, Nanyang Technological University, Singapore, 12–13 August.
Conference on Mathematical Logic and Set Theory: Chennai, India, 15–17 August.
ARCOE: Automated Reasoning about Context and Ontology Evolution, Lisbon, 16–17 August.
ECAI: 19th European Conference on Artificial Intelligence, Lisbon, Portugal, 16–20 August.
European Meeting of Statisticians: Department of Statistics and Insurance Science, University of Piraeus, Greece, 17–22 August.
Truth Matters: Toronto, 18–20 August.
Artificial Life: 12th International Conference on the Synthesis and Simulation of Living Systems, Odense, Denmark, 19–23 August.
COMPSTAT: 19th International Conference on Computational Statistics, Paris, France, 22–27 August.
CIPP: Collective Intentionality VII, Perspectives on Social Ontology, University of Basel, Switzerland, 23–26 August.
CSL: Annual Conference of the European Association for Computer Science Logic, Brno, Czech Republic, 23–27 August.
Concept Types and Frames: in Language, Cognition, and Science, Düsseldorf, Germany, 24–26 August.
ESPP: Meeting of the European Society for Philosophy and Psychology, Bochum and Essen, Germany, 25–28 August.
AiML: 8th International Conference on Advances in Modal Logic, Moscow, 25–29 August.
Symposium on Michael S. Moore's Causation and Responsibility: Rutgers University School of Law-Camden, 27 August.
ASAI: 11th Argentine Symposium on Artificial Intelligence, Ciudad Autónoma de Buenos Aires, 30–31 August.
Because II: Humboldt-Universität zu Berlin, Germany, 30 August - 1 September.
MALLOW: Multi-Agent Logics, Languages, and Organisations Federated Workshops, Lyon, France, 30 August - 2 September.

September

ICTAC: 7th International Colloquium on Theoretical Aspects of Computing, Natal, Brazil, 1–3 September.
KSEM: 4th International Conference on Knowledge Science, Engineering and Management, Belfast, Northern Ireland, UK, 1–3 September.
FEW: 7th Annual Formal Epistemology Workshop, Konstanz, 2–4 September.
CMM Graduate Conference: University of Leeds, 3 September.
TIME: 17th International Symposium on Temporal Representation and Reasoning, Paris, France, 6–8 September.
CP: Principles and Practice of Constraint Programming, St. Andrews, Scotland.6–10 September

Principles and Methods of Statistical Inference with Interval Probability: Durham, 6–10 September.
Causation and Disease in the Postgenomic Era: 1st European Advanced Seminar in the Philosophy of the Life Sciences, Geneva, Switzerland, 6–11 September.
Logic, Algebra and Truth Degrees: Prague, Czech Republic, 7–11 September.
Pluralism in the Foundations of Statistics: University of Kent, Canterbury, UK, 9–10 September.
CNL: 2nd Workshop on Controlled Natural Languages, Marettimo Island, Sicily, Italy, 13–15 September.
PGM: 5th European Workshop on Probabilistic Graphical Models, Helsinki, Finland, 13–15 September.
Epistemic Aspects of Many-valued Logics: Prague, 13–16 September.
Levels of Processing: Foundations of Social Cognition: University Club Bonn, 16–18 September.
AS: Applied Statistics, Ribno, Bled, Slovenia, 19–22 September.
GAMES: Annual Workshop of the ESF Networking Programme on Games for Design and Verification, St Anne's College, Oxford, UK, 19–23 September.
Words and Concepts: An Interdisciplinary Workshop on Philosophy, Psychology, and Linguistics: University of Granada, Spain, 20–21 September.
IVA: 10th International Conference on Intelligent Virtual Agents, Philadelphia, Pennsylvania, USA, 20–22 September.
LRR: Logic, Reason and Rationality, Centre for Logic and Philosophy of Science, Ghent University, Belgium, 20–22 September.
World Computer Congress: International Federation for Information Processing, Brisbane, Australia, 20–23 September.
ECML: European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases, Barcelona, Spain, 20–24 September.
MATES: 8th German Conference on Multi-Agent System Technologies, Karslruhe, Germany, 21–23 September.
Truth, Knowledge and Science: 9th National Conference of the Italian Society for Analytic Philosophy, University of Padua, 23–25 September.
&HPS3: Integrated History and Philosophy of Science, Indiana University, Bloomington, 23–26 September.
Logic and Language Conference: Northern Institute of Philosophy, University of Aberdeen, 24–26 September.
SMPS: 5th International Conference on Soft Methods in Probability and Statistics, Mieres (Asturias), Spain, 28 September - 1 October.
Truth, Meaning, and Normativity: Department of Philosophy, Institute for Logic, Language and Computation, Universiteit van Amsterdam, 30 September 2 October.

October

E-CAP: 8th European Conference on Computing and Philosophy,Muenchen, Germany, 4–6 October.

Objectivity and the Practice of Science: Tilburg Center for Logic and Philosophy of Science, 5 October.
AIAI: 6th IFIP International Conference on Artificial Intelligence. Applications & Innovations, Ayia Napa, Cyprus, 5–7 October.
Calculation, Intuition, and A Priori Knowledge: Tilburg University, The Netherlands, 5–8 October.

Causality in the Biomedical and Social Sciences

Erasmus University Rotterdam, 6–8 October

LPAR: 17th International Conference on Logic for Programming, Artificial Intelligence and Reasoning, Yogyakarta, Indonesia, 10–15 October.
Philosophy of Mind, Reduction, Neuroscience: University of Lausanne, Switzerland, 12–16 October.
SEFA: 6th Conference of the Spanish Society for Analytic Philosophy, University of La Laguna, Tenerife.14–16 October
Philosophy of Scientific Experimentation: A Challenge to Philosophy of Science: Center for Philosophy of Science, University of Pittsburgh, 15–16 October.
The Nature of Belief: The Ontology of Doxastic Attitudes, University of Southern Denmark, Odense, 18–19 October.
FMCAD: International Conference on Formal Methods in Computer-Aided Design, Lugano, Switzerland, 20–23 October.
ADT: 1st International Conference on Algorithmic Decision Theory, Venice, Italy, 21–23 October.
Workshop on Bayesian Argumentation: Department of Philosophy & Cognitive Science, Lund University, Sweden, 22–23 October.
Field Science: 26th Boulder Conference on the History and Philosophy of Science, University of Colorado at Boulder, 22–24 October.
NonMon@30: Thirty Years of Nonmonotonic Reasoning, Lexington, KY, USA, 22–25 October.
IJCCI: 2nd International Joint Conference on Computational Intelligence, Valencia, Spain, 24–26 October.
BNAIC: 22nd Benelux Conference on Artificial Intelligence, Luxembourg, 25–26 October.
ICTAI: 22th International IEEE Conference on Tools with Artificial Intelligence, Arras, France, 27–29 October.

November

ICMSC: IEEE International Conference on Modeling, Simulation and Control, Cairo, Egypt, 2–4 November.
LogKCA: International Workshop on Logic and Philosophy of Knowledge, Communication and Action, Donostia, San Sebastiń, Spain, 3–5 November.
MICAI: 9th Mexican International Conference on Artificial Intelligence, Pachuca (near Mexico City), Mexico, 8–12 November.
Causation, Coherence, and Concepts: Konstanz, 11–13 November.

LENLS: Logic and Engineering of Natural Language Semantics, Tokyo, 18–19 November.
TAAI: Conference on Technologies and Applications of Artificial Intelligence, Hsinchu, Taiwan, 18–20 November 18-20.
KICS: 5th International Conference on Knowledge, Information and Creativity Support Systems, Chiang Mai, Thailand, 25–27 November.

December

CACS: International Congress on Computer Applications and Computational Science, Singapore, 4–6 December.
NIPS: 24th Annual Conference on Neural Information Processing Systems, Vancouver, B.C., Canada, 6–11 December.
From Cognitive Science and Psychology to an Empirically-informed Philosophy of Logic: Amsterdam, 7–8 December.
ICDM: International Conference on Data Mining, Sydney, Australia, 13–17 December.
SILFS: International Conference of the Italian Society for Logic and Philosophy of Sciences, University of Bergamo, Italy, 15–17 December.
International Conference on Recent Advances in Cognitive Science: Varanasi, U P, India, 18–20 December.

§7
Courses and Programmes

Courses

Formal Epistemology School: Northern Institute of Philosophy at the University of Aberdeen, 14–18 June.
NASSLLI: 4th North American Summer School in Logic, Language and Information, Bloomington, Indiana, 21–25 June.
First European Summer School on Life & Cognition: Donostia-San Sebastian, Basque Country, Spain, 22–26 June.
Model Theory: LMS/EPSRC Short Course, University of Leeds, 18–23 July.
AII: Asian Initiative for Infinity, Graduate Summer School in Logic, National University of Singapore, 28 June - 23 July.
ISSSEO: International Summer School in Social and Ecological Ontology, Castello Tesino and Cinte Tesino, Italy, 5–9 July.
The Science of the Conscious Mind: Vienna, 5–16 July.
Pascal2 Machine Learning Bootcamp: Pattern Analysis, Statistical modelling and ComputAtional Learning, Marseille, France, 5–13 July.
UCLA Logic Center: Undergraduate Summer School in Mathematical Logic, Los Angeles, USA, 5–23 July.
NN: Summer School on Neural Networks in Classification, Regression and Data Mining, Porto, Portugal, 12–16 July.

Analytic Pragmatism, Semantic Inferentialism, and Logical Expressivism: 2nd Graduate International Summer School in Cognitive Sciences and Semantics, University of Latvia, Riga, 19–29 July.
Meaning, Context, Intention: Central European University (CEU), Budapest, Hungary, 19–30 July.
ESSLLI: European Summer School in Logic, Language and Information, University of Copenhagen, Denmark, 9–20 August.
SIPTA: 4th school of the Society for Imprecise Probability: Theories and Applications, Durham, UK, 1–6 September.
Logic or Logics?: Mini-course and Workshop, Arché Research Centre, St Andrews, Scotland, 27 September–1 October.
BLT: Bochum-Lausanne-Tilburg Graduate School: Philosophy of Language, Mind and Science on Calculation, Intuition, and A Priori Knowledge, Tilburg University, The Netherlands, 5–8 October.

Programmes

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: Philosophy of Science, Technology and Society, Enschede, the Netherlands.
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 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 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.
MSc in Mathematical Logic and the Theory of Computation: Mathematics, University of Manchester.
MSc in Artificial Intelligence: Faculty of Engineering, University of Leeds.

MA in Reasoning

An interdisciplinary programme at the University of Kent, Canterbury, UK. Core modules on logical, causal, probabilistic, scientific, mathematical and machine reasoning and further modules from Philosophy, Psychology, Computing, Statistics, Social Policy, Law, Biosciences and History.

MSc in Cognitive & Decision Sciences: Psychology, University College London.
MSc in Cognitive Science: University of Osnabrück, Germany.
MSc in Philosophy of Science, Technology and Society: University of Twente, The Netherlands.
Master of Science: Logic, Amsterdam.

§8
Jobs and Studentships

Jobs

Post-doc position: in the VIDI Project "Reasoning about quantum interaction: Logical modelling and verification of multi-agent quantum protocols", University of Groningen, deadline 7 June.
Post-doc position: within the project "Metaphor and Metonymy: Addressing a Debate and a Neglected Problem", School of Computer Science, University of Birmingham, deadline 16 June.
Lectureship: in Philosophy, AOC: at least one among philosophy of mind, formal logic, history of modern philosophy, Department of Philosophy, University of Nottingham, deadline 17 June.
Research and Teaching Position: in Philosophy of Science, UNAM, Mexico City, deadline 6 August.

Studentships

PhD position: in a research project entitled "Contextual and formal-logical approach to scientific problem solving processes", Centre for Logic and Philosophy of Science, Ghent University, deadline 6 June.
Two PhD positions: in the VIDI Project "Reasoning about quantum interaction: Logical modelling and verification of multi-agent quantum protocols", University of Groningen, deadline 7 June.
Jacobsen Fellowships and Royal Institute of Philosophy Bursaries: for the academic year 2010–2011, deadline 11 June.
BSPS Doctoral Scholarship: in Philosophy of Science, deadline 1 August.

www.kent.ac.uk/reasoning