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§1 Editorial

I am delighted to be the guest editor of this issue of *The Reasoner* and I wish to thank Jon Williamson and Federica Russo for the invitation. I will open this issue with an interview with Theo A. F. Kuipers. Theo is Professor of Philosophy of Science at the University of Groningen, where he taught till this academic year a number of courses firmly entrenched in the analytical tradition of "formal" philosophy of science.

As he made immediately clear in our conversation, Theo disagrees with the idea that the "classical" tradition of Carnap, Hempel and Nagel has been definitively superseded by the more recent trends in the "new" philosophy of science and in the sociology of scientific research. Logical analysis and "rational reconstruction"—or "explication", as Theo prefers to call it—are still important tools for the philosopher of science. This is a main message of his *Structures in Sciences* (Kluwer A.P., 2001), an "advanced textbook" in what Theo has dubbed "neo-classical philosophy of science". His previous book, *From Instrumentalism to Constructive Realism* (Kluwer A.P., 2000), is an outstanding essay of the neo-classical approach, and includes Theo's main results concerning confirmation, empirical progress and truth approximation (also known as *verisimilitude* or *truthlikeness*). In his career, Theo has worked on an impressive variety of philosophical problems, such as inductive logic, explanation, reduction and the structuralist view of scientific theories. His results on these topics are probably best illustrated by the papers collected in the two volumes of *Essays in Debate with Theo Kuipers* (Rodopi, 2005), edited by two of Theo's former PhD-students, Roberto Festa and Jeanne Peijnenburg, and a former post-doc, Atocha Aliseda. Thirty seven philosophers and scientists from all over the world comment on his work, and Theo replies to each of them in a lively debate which is the best evidence of the importance of his philosophical activity. Theo's last edited book is *General Philosophy of Science:*

Focal Issues (Elsevier, 2007), the first volume of the *Handbook of the Philosophy of Science* edited by Dov Gabbay, Paul Thagard and John Woods. The book collects a number of articles by leading scholars on the central topics in (neo-classical) philosophy of science and it is likely to become a standard reference for the scholars in this field.

I'm keeping this editorial short, in order to let Theo tell you about his intellectual history and his philosophical views. This preamble was to say that Theo is one of the few persons I know who can answer such "big questions" like: What is philosophy of science? What is its proper method? What has science to do with truth? As the reader will see, in our conversation we touched upon each of these problems.

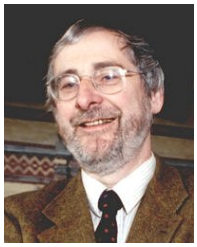
Gustavo Cevolani
Philosophy, Bologna

§2
Features

Interview with Theo Kuipers

Gustavo Cevolani: First of all, thank you for agreeing to be this month's interviewee. As far as I know, you studied mathematics, and you only later became interested in philosophy. Can you start by telling us how you first got into logic and philosophy of science as an area of research? Are there some "big names" in philosophy of science that, more than others, influenced your way of thinking and doing research?

Theo Kuipers: Looking for the nearest non-Catholic academic institution to study mathematics, I went in 1964 to the *Technische Hogeschool* (a polytechnic) in Eindhoven, where I got my kandidaats (B.Sc.) in 1967. However, I disliked the instrumentalist way of learning mathematics. Since I wanted to understand the working of, e.g., differentiation and integration tricks, I enrolled in philosophy of mathematics at the University of Amsterdam. I liked the course on the Foundations of Mathematics by Haskell B. Curry, the successor of Evert W. Beth, and other foundational courses by Kees Doets. Moreover, in my extended minor in mathematics I learned algebra, topology and probability theory. This was the kind of mathematics that I would have liked to have had from the beginning, which would have been the case had I started immediately at a "normal" university. In that case, however, it is unlikely that I would have switched to philosophy. As a matter of fact, I became even more attracted by areas taught by former students and co-workers of Beth, notably philosophical logic (Else Barth) and philosophy of science (Hans Mooij, Peter Wesly). Finally, I profited a lot from the courses in analytical philosophy of Gabriel Nuchelmans in Leiden. Carnap, Hempel and Nagel on the one hand and Popper on the other attracted me the most, the first three for their style and method, Popper for his ideas. These four represent what I like to call "classical philosophy of science". By the way, my false start in a technical science institution explains my lifelong interest in design science, an area that used to be neglected in philosophy of science.



GC: Your textbook *Structures in Science* (2001) is a manifesto of what you call the "neo-classical" approach to philosophy of science. Here, you complain that "the philosophy of science seems to have lost its self-confidence" and propose the neo-classical approach to overcome this "crisis". Which are the essential ideas underlying this approach?

TK: From the seventies on it became fashionable in international philosophical circles, and even more in Dutch circles, to suggest that authors like Kuhn and Feyerabend successfully abolished the insights of the classics, not to speak of the upcoming relativist sociologists of science. However, many cute babies were thrown away with the bathwater, such as the following. It was wrongly concluded that the distinction between observational laws and (genuine) theories depended on the assumption of a theory-free observational language. As argued by Lakatos, Kuhn's global analysis of scientific behaviour could well be reinterpreted as illustrating the rationality of science. Refinement of Nagel's analysis of reduction was perfectly possible, as shown by Nickles, Schaffner and Sklar. Finally, "concept explication" could well remain the main method, and in fact this happened in analytical philosophy of science, although it was seldom acknowledged. In sum, as a rule, the worthwhile insights of the critics of classical philosophy of science could and should be used for refinements, leading to neo-classical philosophy of science. Let me mention the example about which I claim to improve upon Lakatos: non-falsificationist behaviour of the instrumentalist type, as documented by Kuhn and Lakatos, is perfectly rational, because it is more efficient for truth approximation than straightforward falsificationist behaviour.

GC: A fundamental theme of your research has been the concept of verisimilitude or truthlikeness, and its applications. Can you explain in a few words what verisimilitude is and why it is important for philosophers of science? A curious impression one may gain exploring the literature is that verisimilitude is mainly a "European affair": is this impression misleading? Moreover, it isn't difficult to find discussions of scientific progress or realism that don't even mention truth-

approximation: what are the reasons for such a lack of interest?

TK: Let me first amplify this element of surprise. An important success of the first decades of (constructive) analytic philosophy was the discovery, notably by Russell, Carnap, Hempel, Beth and Barth, that the recognition of the relational character of concepts can be an important means in the solution of age old philosophical problems. This pertains not in the least to asymmetric relations that are constitutive for comparative concepts like "longer than", "caused by", etc. Similarly for the concept "better than", and hence for "improvement" and "progress". Even more than European ones, American contributors to the realism-antirealism debate seem to be unaware of the possible relevance of this insight. One continues to talk in classificatory terms: "true" versus "false" theories and reference claims on the realist side, and "empirically adequate" versus "inadequate" theories on the empiricist side. The weakening to "(not) approximately true theories" does not help, for it remains non-comparative and can explicate "progress" at most in a simplified, arbitrary way. Compare this with "(not) more or less long" to explicate growth. From the relational point of view it is rather plausible to think in terms of "empirically more successful" and "closer to the truth", the latter being the crucial notion behind "verisimilitude" (or truthlikeness). In terms of my favorite example, it may well be that Einstein's theory is false, it may even be far from the truth, but we have good empirical reasons to assume that it is closer to the truth than Newton's. In general, a false theory may or may not be close to the truth, but in both cases it may be closer to the truth than another one. The latter is more easy to assess, however provisional, than the former, notably by comparison of empirical problems and successes.

GC: A striking aspect of your work is your "formal" approach to philosophical problems, which is very different from the informal and "narrative" approaches so popular in contemporary philosophy of science. What are the advantages of a formal approach to philosophy of science and, more particularly, what is the role of "theorems" in such discipline? As an example, a central result of your *From Instrumentalism to Constructive Realism* (2000) is the so called "Success theorem". Can you explain in a few words the intuitive content and methodological importance of this result?

TK: As a rule, one engages in the explication of one or more concepts in order to explicate intuitions or to dissolve paradoxes in which these concepts are crucial. In case of intuition explication, the subsequent task is to prove a theorem to the effect that the intuition, if reformulated in explicated terms, becomes either justified, demystified or undermined, whatever the case may be. In case of dissolving a paradox, it has to be shown that it can no longer be construed in the explicated terms. One example is the (qualitative) explication of the intuition that empirical progress is functional for truth approximation, by proving first of all the "success theorem", according to which (actual, but not directly assessable) truth approximation entails assessable empirical progress. The methodological importance of this (simple) theorem stems from the fact that empirical progress can best be achieved by the instrumentalist methodology, according to which a falsified theory remains in the game as long as it is more successful than other (falsified) theories, whereas the falsificationist methodology is supposed to disqualify such theories altogether.

GC: Arthur Fine has famously claimed that "realism is dead", and many philosophers seem to agree with him. You have devoted much effort to defending a fairly strong form of scientific realism, "constructive realism". How healthy is realism today, in your view?

TK: Arthur Fine and his fellow diehard empiricists remain to take only hardnosed realism into account. Realist responses in the literature to the antirealist charges, such as Laudan's famous pessimistic meta-induction, usually are retreats of realism of a non-comparative and a non-constructive nature. In both respects my kind of realism, being constructive and comparative, is weak, but it is still a serious kind of realism (see my "Comparative realism as the best response to antirealism", to appear in *Logic, Methodology and Philosophy of Science. Proceedings of the Thirteenth International Congress*, Clark Glymour, Wang Wei and Dag Westertahl (eds.), Beijng, 2007). That is, although I neither believe in some kind of essentialism, leading to an ideal vocabulary fitting the natural world, nor in the idea that most of our most successful theories are true, I believe in two realist convictions. First, science can construct, by profiting from empirical findings, more and more suitable vocabularies for domains of the natural world, all of which have an unknown strongest true theory, that is, the truth about a given domain in a given vocabulary, and, second, by searching empirically more successful theories we approach that truth, as a rule. Without such a refined kind of realism there remain two mysteries. For the short term dynamics of theories it would be a miracle why certain theories remain more successful than other ones; this is a variant of Putnam's no-miracles argument. Moreover, there would be no basis for the long term, clearly successful, dynamics of science, according to which, for the time being, not just the most successful theories, but only extremely successful ones get accepted as (approximately) true. The important consequence of this 'theoretical induction' is that their theoretical terms can be added to the observational vocabulary, in the sense that they become applicable, that is, it becomes determinable whether they apply or not. However, for practicing scientists there is no compelling reason to become a constructive comparative realist. As

long as they aim at improving their theories they serve the purpose of truth approximation. But philosophers of science that remain unconditional empiricists persist in a kind of (indeed, strictly speaking, unrefutable) skepticism that neglects the task of trying to understand the very possibility of successful scientific practice, leaving that a double mystery. By the way, regarding more versus less successful theories we can only apply the rule of inference to the best one, that is, the most successful one, as the closest to the truth, a plausible correction of so-called inference to the best explanation (as the true theory).

GC: The fruitful interaction of philosophy of science with logic and Artificial Intelligence has recently produced a number of new methodological research programs: which are, in your opinion, the most interesting and promising ones? Are there any particular topics that you would recommend to philosophy graduate students starting out today?

TK: My favorite example would be "computational philosophy" in general and "computational philosophy of science", as initiated and developed by Herbert Simon, Pat Langley, Paul Thagard, and several others, in particular. In the latter, one tries to solve classical problems in the philosophy of science with means that have been particularly developed in cognitive psychology and artificial intelligence research. The kind of results aimed at are computer programs that enable certain cognitive tasks, or at least to simulate them, such as, discovering laws from data, designing hypotheses, evaluation and revision, concept formation, proposing experiments, etc. To be sure, the possibility for the computational philosophy of science to be of considerable practical relevance is still far away. However, in principle the perspective of more or less standard computer assisted discovery, evaluation and revision need not remain science fiction.

GC: Before, I asked you about your "intellectual models". Now, I would also like to ask you about the "bad examples" in philosophy of science. I was surprised, but also amused, to find an article where you criticised "the Pavarottis of analytical philosophy". I couldn't read it, since it was in Dutch, but perhaps you may tell us something about its contents?

TK: Without denying that philosophers such as Wittgenstein, Quine, Putnam, Davidson and Rorty have also written clear, original and defensible papers, about which analytical philosophy can be proud of, they frequently write so vaguely, unclearly and incomprehensibly that they can easily compete with those continental philosophers that are denounced for their obscurity. As with the latter, the messages of the former usually make some sense, but when understood it is clear that they could have been presented "claire et distinct" in a constructive analytical way. Now the writings of both groups too often function temporarily or permanently as intellectual prisons.

GC: Let me conclude this interview with a completely different and more general question. The fate of philosophy and that of liberty are strictly intertwined. The Netherlands has been the home of freedom of speech since the time of Spinoza. Nowadays, however, this glorious tradition seems to be under attack. The violent deaths of Pim Fortuyn and Theo van Gogh and the frightening threats to Ayaan Hirsi Ali and Geert Wilders immediately spring to my mind. The so called "Van der Horst affaire"—a recent case of self-censorship at Utrecht University, where Prof. van der Horst delivered an expurgated version of his retirement lecture, skipping any reference to Islamic antisemitism—suggests that even academic freedom is at risk. Can you share with us your feelings about the present situation of intellectual and political freedom in your country?

TK: That you, abroad, have heard of this unhappy Utrecht affair surprises me. A short answer to your question is almost impossible. Any violence of a fundamentalist nature, be it of ecological (in case of Fortuyn), Islamic (in case of Van Gogh), Jewish (in case of Rabin), or Christian (in case of the abortion doctor George Tiller) nature, should of course severely be condemned. Moreover, it should be possible to utter any criticism of whatever nature and subject. Assuming some mature prudence, based on understanding of educational limitations of many among us, the intellectual and political freedom in our country is still very impressive. As a philosophical addendum, I would like to conclude with the claim that debates about "respect" in this context frequently are at cross-purposes. We still have to learn the conceptual distinction between two kinds of respect, viz. mere tolerance and serious appreciation.

Can Nature Make an Argument?

The American philosopher C.S. Peirce (1839-1914) claimed that arguments, and more generally, "processes of reasoning," should not be looked at as a strictly human affair. Processes of reasoning, Peirce argued, are indicative of "mind" and he believed that mind is found throughout the whole of nature—not just within the human intellect. An argument, defined as "a process of inference leading to a conclusion," thus comes to cover a wide array of cosmic expressions on Peirce's view (Peirce, 1931: *Collected Papers of Charles Sanders Peirce*, Harvard University Press, 6.456.) Peirce's thesis was that the universe displays various processes of reasoning and that these processes are evidenced in the world's phenomena, most apparently through the evolutionary development that led to human beings who explicitly state arguments as such.

Peirce thought that the universe tends to behave "reasonably," yet he also thought that cosmic rationality allows for statistical variation from established law. Na-

ture's laws are taken to be the conclusions of arguments made by developing cosmic rationality. These arguments are not deductive, however; they are inductive, and the drawn conclusions always retain a degree of probability in their accuracy. The conclusions of these arguments are explicable in terms of reasoning expressions "developing in a pattern of concrete reasonableness" (Peirce, 1931: 3.4.) Peirce thought that the laws of the universe congeal into statistical habit and these habits represent conclusions that are susceptible to modification over time. Any phenomenon in the universe can represent a set of premises leading to a conclusion. For example, a poem or a symphony may appear to be a finely crafted argument. Peirce wrote, "The Universe as an argument is necessarily a great work of art, a great poem—for every fine argument is a poem and a symphony—just as every true poem is a sound argument." (Peirce, 1931: 5.119.) As I interpret Peirce's theory, human beings would be one conclusion of cosmic rationality for we represent the development of statistical variations within the process of evolution that have stabilized into the phenomenon of a species, a living habit of the universe. The "conclusion" of the human being isn't a finished product, however. Something like "humanity" is constantly undergoing revision and may also serve as a premise to further other cosmic arguments. A general point or conclusion "humanity" had been made with reasons leading up to that point. In turn, the conclusion itself serves as another premise, and so on.

There is a degree of ambiguity regarding how Peirce thought that the universe appears to bring together different premises—different evolutionary phenomena including species, laws, and other items of the universe—and then assert conclusions (laws or statistical regularities) based on the arrangement of those phenomena. If, for example, conclusions slowly change over the course of time, then the possibility that today's conclusions may be drawn differently tomorrow indicates a contingent linkage between premises and conclusion. This challenges whether any "argument" has been made at all because the phenomenon of conclusions simply could be the result of randomly pieced together phenomena that have consistently *appeared* as arguments, but are not, or the conclusions could be the result of a blind guess, not deliberate reasoning. I believe that a Humean might critique Peirce's theory in this way. Similar objections are raised against teleological arguments for divine mentality and design.

Peirce answered this objection through his theory of "colligation." Colligation consists in the activity of bringing together certain premises that one believes to be evident, yet that have not been previously considered together. This activity involves a degree of chance and spontaneity, but is directed in intent. Peirce wrote that,

> Colligation is a very important part of reasoning, calling for genius perhaps more than any other part of the process. Many logicians refuse the name of reasoning to an inferential act of which colligation forms no part. Such an inferential act they call *immediate inference*. This term may be accepted; but although colligation certainly gives a higher intellectuality to inference, yet its importance is exaggerated when it is represented to be of more account than the conscious control of the operation. The latter ought to determine the title of *reasoning* (Peirce, 1931: 2.442)

Colligation sets reasoners apart from mere computational machines—what Peirce in 1887 called "logical machines"—because while machines may draw inferences (drawing conclusions from given premises), computers lack the spontaneity found in the act of forming arguments based on colligated inferences. It might be said that colligation is what demonstrates the freedom and spontaneity of the universe's mind-like character to make its arguments, securing cosmic rationality against any sort of strict logical or metaphysical determinism, or sheer chance associated with a series of "mindless" happenstance evolutionary events that simply appear as arguments but are not. As Peirce put it,

> Every reasoning machine . . . has two inherent impotencies. In the first place, it is destitute of all originality, of all initiative. It cannot find its own problems; it cannot feed itself. It cannot direct itself between different possible procedures . . . In the second place, the capacity of a machine has absolute limitations; it has been contrived to do a certain thing, and it can do nothing else (Peirce, *Writings of Charles S. Peirce*: Bloomington: Indiana University Press, 6.70)

Nature—and living beings within it—are reasoners if they are able to colligate premises and venture conclusions. The universe seems to be the greatest reasoner, as it has made the most profound arguments.

If human beings are a cosmic conclusion then nature has made an argument that is able to "argue" back about its creator, as it were. And so the universe is not a machine with pre-set rules determining what the conclusions must be. Rationality in nature only seems to say what the conclusions may be. If his theory of colligation is correct, I believe Peirce's claim that nature can make an argument should be able to withstand the same sort of criticisms leveled against teleological arguments.

Leon Niemoczynski
Immaculata University

Wavering about Logic

This paper was stimulated by Fabien Schang's recent discussion of a new paraconstent logic in this journal. But it centres on much broader questions to do with paraconsistent logics generally. It points to the relevance of ambiguous pictures and their proper formal descriptions in the understanding of supposedly contradictory situations, showing thereby that there is no logic at all in the minds of the inconsistent. There are representations of contradictions, in a certain limited sense, but one must not be drawn into taking those representations as representing a reality in any sense.

Fabien Schang, in the context of an assessment of some matters in my paper (1995: 'Paraconsistent Logics?' *Journal of Philosophical Logic* 24, 451–4), has now proposed a four-valued logical system to handle some difficulties by means of a paraconsistent logic (2009: 'Inconsistent Logics! Incoherent Logics?' *The Reasoner* 3.7, 8–9). I am not sure that this system is needed on the basis of my article, since what I relevantly said there was not as Schang represents me, but instead merely that Graham Priest's paraconsistent 'negation' was not contradiction (as Priest has insistently claimed), but subcontrariety. And Schang even agrees that contradictories and subcontraries do have the properties that I took them to have.

I also, in my paper, provided a critique of a four-valued system that has the same overall structure as Schang's: Belnap and Dunn's well-known system which has 'told true/told false' in place of Schang's 'held true/held false'. So I will not repeat my 1995 argument against such four-valued logics here. Instead I shall take the opportunity to present a much larger argument against Schang. Indeed it is an argument against *any recommendation* for a paraconsistent logic. The point came to me after reading Priest's account of 'Sylvan's Box' (1997: 'Sylvan's Box: A Short Story and Ten Morals' *Notre Dame Journal of Formal Logic* 38.4, 573–582.)

Priest's story is supposedly about himself, wavering about what is in a box. At first he does not see anything in the box, and so considers it to be empty. But then he notices a small statue in the box and is more inclined to say it is not empty. Disregarding the opportunity to make qualified remarks like 'it's almost/largely empty', he is still drawn to saying 'it is empty', which is taken to imply that he is prepared to describe the situation by means of a contradiction. But the fact that readers of the story do not draw the classical conclusion from this inconsistency is what Priest thinks is the most significant thing. For by the classical rule of Explosion everything can be derived from a contradiction. Priest therefore draws the moral that some paraconsistent logic is required to describe the situation, i.e., a logic in which Explosion does not hold.

The first trouble with this suggestion is not which deviant logic one should go on to specify (whether Priest's LP, or either of the four-valued logics of Belnap and Dunn, or Schang, or some other; there are so many 'on the market'.) It is whether you should (or even could, to general agreement) specify *any logic at all*. For if one is dealing with someone who cannot make up their mind about, or is confused or inarticulate about, whether a box is empty or not, why should one think that they would firmly accept, or could work in a clear-headed way with, any offered logic? They could just as easily vacillate with respect to the principles or practise of that, as well! But if they are uncertain about what logic to apply, or have difficulties with its consistent (sic) application, then their failure to draw the classical conclusion from their state of irresolution and confusion has quite a different analysis. It is not just Explosion that is in doubt, for them, but maybe all other logical rules as well!

There is a more conclusive logical point to make than this, as we shall see, but before that it is worthwhile remembering how *factual* the above state of affairs often is. For looking at the matter sociologically, in terms of the kind of stories that some people enjoy, there is a well-known genre of literature that, often enough, follows the above pattern in a broader sense: the scripts of B-grade movies. In such stories continuity and consistency are not the virtues honoured elsewhere, since comprehension of the details of the plot is not a vital requirement on the part of appreciative audiences for this kind of entertainment, even in the places where it might be possible. What matters to the kind of audience that enjoys such movies is the fast paced action or gripping drama of scene after discrete scene, no matter how disjointed or how connected they are. The attention span of the audience members evidently can last through an episode, but their memory does not seem to stretch much further. So naturally their minds do not 'explode': they just do not (maybe even cannot) put two and two together!

However, one must separate out the supposed activities of characters in stories and films from the actual activities of the readers and viewers of such entertainments. For the more rigorous point to make, with regard to the story in 'Sylvan's Box' and the like, is that, indeed, it is just a *story*. So an objective account of the matter requires that the details of the story are preceded by a context-setting operator such as 'according to the story'. But it is well known that there is no need for a paraconsistent logic to account for inconsistent stories, any more than inconsistent beliefs. One can easily have $Bap.Ba\neg p$ (where '$\neg$' is Boolean negation), while the logic of the situation remains quite classical. What is required is not some new *paraconsistent* logic, but merely an *intensional* logic, for instance in the belief case that provided by the probabilistic analysis of degrees of be-

lief common in Decision Theory. I have myself proposed such a logic applicable to aesthetic enjoyments quite generally in (1993: 'The Incoherence of the Aesthetic Response' *British Journal of Aesthetics* 33, 168–72.) What is then actually the case is quite orderly, and separated from the confusion that might seem to be the case to a believer whose mind is in a complete whirl.

Specifically (see my 1993: 'Probabilistic Foundations for Operator Logic' *British Journal for the Philosophy of Science* 44, 517–30) one can have Bap and at the same time Ba¬p, if Bap holds just so long as a's subjective probability of p is greater or equal to a half. Notice that one then still cannot have Ba(p.¬p), which shows formally not only just how it is that the confused agent 'cannot put 2 and 2 together', but also how it is that the various things represented do not form themselves into some alternative world or reality. For the conjunctive rule Adjunction crucially fails with probability: one can have it probable that p and probable that q while it is not at all probable that p.q.

By formalising the situation using an intensional logic one therefore introduces a needed separation between what is actually the case in the world and what is believed or represented to be the case in some mind, or some picture. That needed separation is just what is missing not only in Priest's quasi-autobiographical case, but also in other offerings by enthusiasts for paraconsistent logics. For instance, Chris Mortensen, in the same volume as Priest's story about Sylvan's Box (1997: 'Peeking at the Impossible' *Notre Dame Journal of Formal Logic* 38.4, 527–534), wanted to say that, since Escher's 'Penrose Triangle' represents both that the nearest point is higher than the furthest point, and that the nearest point is lower than the furthest point, therefore some paraconsistent logic must be working in the minds of viewers. Why, Mortensen asked, is this figure seen as a 2D representation of an impossible 3D structure rather than a representation of a disjointed, possible one? The answer is that, if a viewer does the former then, in the terminology of aesthetic theory, he is 'under-distancing'— see, for example, my (1987: 'Fictions', *British Journal of Aesthetics* 27, 145–55.) For if the viewer keeps his proper 'aesthetic distance' then he will realise that there is merely the appearance of a contradiction, and in no sense the reality of one.

The drawing *does not* represent that both p and ¬p hold, for a certain 'p'; instead it both represents that p holds and represents that ¬p holds. It has two aspects, in other words, and no more than Wittgenstein's 'duck-rabbit' represents something at once both a duck and a rabbit, Penrose's Triangle does not represent anything as simultaneously both higher and lower than some other thing. Not only does such a situation not actually arise, it cannot even be imagined, or drawn. So there is no more 'peeking at the impossible' than there is seeing the impossible. It's impossible!

Hartley Slater
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The Consilience of Complex Evidence

> The Consilience of Inductions takes place when an Induction, obtained from one class of facts, coincides with an Induction, obtained from a different class. This Consilience is a test of the truth of the Theory in which it occurs. (William Whewell, *Philosophy of the Inductive Sciences* (1847) in *Selected Writings of William Whewell*, ed. Yehuda Elkana (Chicago: Chicago University Press, 1984), 121-384, p.257.)

At the age of 37, Robert Joiner was diagnosed with small-cell lung cancer. Believing the cause was his exposure to PCBs (polychlorinated biphenyls) contaminating the insulating oil in the electrical transformers his job required him to disassemble and repair, he sued the manufacturer, General Electric. His attorneys proffered experts to testify to various toxicological, *in vivo*, *in vitro*, and epidemiological studies, arguing that, while none of these was enough *by itself* to establish his claim, *taken together* they were sufficient to meet the standard for proof of causation. Excluding Joiner's experts, the District Court granted summary judgment to G.E.; endorsing the legitimacy of Joiner's experts' "weight of evidence methodology," the Court of Appeals reversed; but the Supreme Court reversed again, with only Justice Stevens seeing any merit in Joiner's epistemological argument (*General Electric Co. v. Joiner*, 522 U.S. 136 (1997)).

Whatever the caliber of Mr. Joiner's evidence specifically, it is clear that some combinations of pieces of evidence really *can* warrant a conclusion even though none of the pieces by itself would be sufficient to do so. Think of the complex congeries of evidence with respect to the theory of evolution; the intersecting lines of evidence suggesting that there was once bacterial life on Mars; or the array of archeological, documentary, etc., evidence of the Roman conquest of Britain. Whewell gave us a good word for this phenomenon—"consilience," "jumping together"—but no real explanation of which congeries of evidence warrant a conclusion to a higher degree than any of their components, or why. The account I developed in *Evidence and Inquiry* (1993; 2nd expanded ed. Amherst, NY: Prometheus Books, 2009, chapter 4) and *Defending Science—Within Reason* (Amherst, NY: Prometheus Books, 2003, chapter 3) can help.

Evidence ramifies, like the entries in a crossword puzzle. How reasonable a crossword entry is depends

on: (1) how well it fits with the clue and already-competed entries; (2) how reasonable those other entries are, independent of the one in question; and (3) how much of the crossword has been completed. Similarly, how well evidence warrants a claim depends on:

E1. how strong the connection is between the evidence and the conclusion: *supportiveness*;

E2. how solid the evidence itself is, independent of the conclusion: *independent security*;

E3. how much of the relevant evidence the evidence includes: *comprehensiveness*.

The more supportive the evidence with respect to a conclusion, the better warranted that conclusion is. But, while the more independently secure the evidence *favorable to* a conclusion is, the more warranted that conclusion, the more independently secure the evidence *against* a conclusion is, the *less* warranted that conclusion. Similarly, the more evidence there is favorable to a conclusion, the more warranted it is; but if adding more evidence makes the combined evidence less positive, the increase in comprehensiveness will lower the degree of warrant.

So: a combination of pieces of evidence will warrant a conclusion to a higher degree than any of its components when, but only when, combining the various elements *enhances supportiveness; and/or enhances the independent security of favorable (or lowers that of unfavorable) evidence; and/or enhances comprehensiveness by introducing further, no less favorable, elements*.

Applying my analysis to the types of evidence typically proffered in a toxic tort case, we see how combined evidence E will sometimes support a causal conclusion C to a higher degree than any of its components alone:

- E will be more comprehensive than any of its components alone; and, if the additional elements are positive, this will enhance warrant.
- While adding evidence from animal studies or toxicology, etc., won't make a flawed epidemiological study less flawed (nor adding epidemiological evidence make a flawed animal study less flawed), additional evidence may make the conclusion of a flawed study more secure than it would otherwise be. This will also enhance warrant.
- If the elements of E interlock to form an explanatory account—as, e.g., evidence of a biological mechanism by which exposure to substance S might bring about disorder D, or evidence that S contains b, which is known to be associated with D, would interlock with epidemiological evidence of elevated risk of D among those exposed to S—this will enhance supportiveness. The interlocking will be tighter, and the enhancement of supportiveness greater, the more narrowly the relevant terms are specified (e.g., if D is "small-cell lung cancer" rather than "lung cancer" or just "cancer"). This too will enhance warrant.

What I have offered is a theoretical analysis, not an algorithm for assessing the weight of complex evidence. Moreover, though we sometimes speak of supportive evidence as making a conclusion "likely," or of a well-warranted conclusion as "likely to be true," these are epistemic likelihoods, not to be confused with the probabilities in the sense of the classical probability calculus (see Haack, *Defending Science*, p.75). But this analysis is enough to suggest plausible answers to such frequently-contested questions as whether epidemiological evidence is essential to proof of causation (no); whether a showing of a doubling of risk is required (no, it is neither necessary nor sufficient); and whether animal studies should be excluded when epidemiological evidence is available (no).

Abstracted from "Proving Causation: The Holism of Warrant and the Atomism of Daubert," *Journal of Health and Biomedical Law*, IV.2, 2008: 253-89.

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The Relativity of the Identity of the Self

Suppose that in the year 5009 a scientist builds an exact physical clone of someone from the past. This clone lives exactly the same life—from birth to death—of the original person; the clone lives in a simulated environment that replicates in every detail all aspects of the original's experiences throughout her lifespan. This clone (let us assume) shares all of the original's physical and mental characteristics from birth to death. Do the original and the clone share the same Self? The answer, we claim, is relative to a point of view (first-person or third-person); there is not an 'absolute' answer to this question.

Take the following assumptions: we define *Person* as a physical object extensionally determined, occupying a particular space-time region. Each particular *Self* is defined as a set of intentional/mental attitudes (temporally determined) held consciously by a person throughout her lifespan.

Let $P1$ stand for the original person who is cloned. Her *Self* consists in the finite set $S1$, $S1 = A1t, A2t, \ldots, Ant$, where the elements are intentional attitudes held by $P1$ at certain specific times. One important aspect in the present scenario is related to the fact

that P1 (for some reason) knows about the cloning scenario. Let k^* stand for this particular knowledge. In this case, $k^* \in S1$. In addition, $P1$ believes that she is the original and not the clone living in the simulation (bel^*, where, likewise $bel^* \in S1$).

Consider now '$P1$'s Life', which refers to the set of the totality of $P1$'s physical actions, relations and interactions—including sensorial interactions—with the physical environment throughout her lifespan. Given a global four-dimensional coordinate reference R, where $R =< x, y, z, t >$, $P1$'s Life consists in a space-time region framed within local coordinate reference R', where $R' =< [x', x''], [y', y''], [z', z''], [t', t''] >$. Person $P1$ corresponds to a four-dimensional body framed within R'.

Consider now $P2$ to be the clone living in the simulation. $P2$'s Life replicates $P1$'s Life in all possible details including its framing within R' (*inside* the simulation the spatio-temporal references are exactly the same as those of $P1$'s Life). Accordingly, from a 'inside the simulation' perspective, Person $P2$ consists in the *same* space-time region (or body) as Person $P1$.

If $S2$ is the complete set of intentional attitudes held by $P2$ at certain specific times, then $k^* \in S2$ and $bel^* \in S2$, since $P1$ and $P2$ are exactly the same in their conscious mental contents over the same time frame. So, $S1$ and $S2$ have *exactly* the same extension, which means that, by the extensionality principle, $S1 = S2$, i.e., there is *only one set* (call it S^*). If, by definition, the Self of $P1$ and $P2$ correspond to the sets $S1$ and $S2$ respectively, it follows that $P1$ and $P2$ have the same Self. This follows even assuming that $k^* \in S^*$, i.e., even given that '$P1 \neq P2$' for $P1/P2$ (since $k^* \in S1$ and $k^* \in S2$). Given that '$P1 = P2$' in terms of $P1/P2$'s epistemic access it is impossible for $P1/P2$ to know if (myself) S^* corresponds to $P1$ or $P2$ ($P1$ and $P2$ occupy exactly the same space-time region within R' coordinate reference and so, they are extensionally identical—are the same four-dimensional body). Therefore, the sentence 'I am $P1$' uttered by $P1$ or $P2$ at any time (meaning 'I am not the clone' expressing the content of bel^*) lacks a truth-value for $P1/P2$. That is, bel^* is not capable of epistemic vindication for $P1/P2$. This captures the phenomenological intuition that, even if you know that there is an absolute replica of you, you can never know if you (a unique Self) are the original or the replica. It also illustrates why it makes sense to ask which *person* you are, the original or the replica, but not which *self* you are. It is meaningless to ask if your*self* is *really* your*self* in normal, rational and non-pathological conditions.

Consider now the scientist responsible for the cloning of $P1$ in the year 5009 and let the scientist be $P3$ (i.e., $P3$ 'creates' $P2$). Let $P3$'s 'point of view' coordinate reference be R (the global $< x, y, z, t >$ coordinate system). For $P3$ '$P1 \neq P2$' since $P1$ and $P2$ correspond to different space-time bodies in R. Now, should $P3$ consider that there is only one self, i.e., $(S1 = S2) = S^*$? Given the extensionality principle of set identity it seems she should. But, since '$P1 \neq P2$' is true for $P3$, the utterance 'I am $P1$' expressing bel^* has a truth-value for her. In particular bel^* is true concerning $P1$ and false in respect to $P2$. Once $bel^* \in S^*$, it turns out that S^* is a set with a belief held to be true and false at the same time by the same Self! $P3$ has to rationally assume that there are two sets, $S1$ and $S2$, where bel^* is true regarding $S1$ but false concerning $S2$. So, $S1$ and $S2$ cannot correspond to the same Self but to different Selves. $P1$ has one Self and $P2$ another.

Although this result has the flavour of a somewhat paradoxical result, all that it reveals is that the identity of a self is always relative to an epistemological perspective: an *egocentric-first person* or an *allocentric-third person* one. It depends on how the Self is identified from each perspective: for the first person (her)'Self' is identified as the set of her own conscious mental contents, whereas the third person identifies a Self (other than its own) by relating that set *with* its bearer.

João Fonseca & Klaus Gärtner
Philosophy of Language, New University of Lisbon

§3
News

Controlled Natural Language, 8–10 June

The Workshop on Controlled Natural Language took place on 8-10 June 2009 on the Sicilian island Maret-timo. Extended abstracts of the contributions were published as CEUR Workshop Proceedings.

Instead of describing each of the 24 papers presented my report focusses on some significant language aspects and a few important applications and tools. Please note that my selection is highly subjective.

Language Aspects

One hotly debated topic was decidability. Ian Pratt-Hartmann has been working on the computational complexity of natural languages and presented several decidable and undecidable fragments of English. Johan Bos proposed a controlled fragment of Discourse Representation Theory with a semantics based on the two-variable fragment of first-order logic with equality. Interestingly Johan began his talk with the warning that even a decidable problem may take ages to be solved.

Paula Engelbrecht et al. reported on end-user evaluations testing the understandability of individual language constructs of Rabbit, a controlled language that can be translated into OWL. Tobias Kuhn presented

a general framework—based on graphical notations—to evaluate controlled natural languages and compare them to other formal languages. First results are very positive. Peter Clark et al. discussed the difficult topic of naturalness versus predictability. Kaarel Kaljurand discussed strategies for paraphrasing controlled natural language and introduced two paraphrasing approaches for Attempto Controlled English.

The Grammatical Framework GF of Aarne Ranta et al. provides a high-level grammar formalism and a library to implement controlled languages. GF allows users to concurrently cover similar fragments in several natural languages, and provides tools for authoring and translation.

Rolf Schwitter addressed the problem of anaphora resolution and suggested a new approach based on interactive knowledge acquisition.

There was a discussion of the "Controlled Natural Language Manifesto" that several authors are collectively writing as a Google document.

Applications and Tools

Rick Shiffman et al. reported on a novel application of controlled natural languages in the field of medicine. Clinical practice guidelines advise practitioners on how to treat patients optimally. A set of guidelines was manually translated into Attempto Controlled English and brought in a form that allows their use in decision support systems.

Marco Cramer et al. presented the Naproche project that uses controlled natural language to express and to check mathematical proofs with the help of proof representation structures.

Ronald Denaux et al. presented ROO, an authoring tool for the ontology language Rabbit. ROO is related to similar approaches to facilitate the construction of controlled language texts, for instance the predictive editors proposed by Kuhn (AceWiki) and Schwitter (PENG).

Gordon Pace et al. use a controlled natural language to formulate contracts that are then translated into temporal deontic logic. They discussed the implications of combining temporal and deontic logic on the design of the controlled language.

Finally, Silvie Spreeuwenberg et al. discussed the application of controlled language to business rules and presented the "Semantic of Business Vocabulary and Business Rules" (SBVR).

Norbert E. Fuchs
Department of Informatics, University of Zurich

Logica, 22–26 June

The 23rd annual symposium Logica, organized by the Institute of Philosophy of the Czech Academy of Sciences, was held on June 22–26 in the Hejnice Monastery situated in the charming north region of the Czech Republic. The symposium presented talks by almost thirty researchers from North America, Europe and Australia, including the invited speakers JC Beall (University of Connecticut, "Truth, Necessity and Abnormal Worlds"), Nuel Belnap (University of Pittsburgh, "Truth Values, Neither-True-Nor-False, and Supervaluations") and Stephen Read (University of St Andrews, "Field's Paradox and its Medieval Solution"). Keeping the traditional spirit of the symposium most of the presented papers principally contributed to *philosophical and mathematical logic*, *history and philosophy of logic*, and *philosophy of language*.

JC Beall discussed the obstacles arising from the addition of a necessity operator to his deflationary/dialethetic theory of truth presented in *Sprandels of Truth* (Oxford, 2009). Nuel Belnap surveyed the role of auxiliary parameters with respect to the formal reconstruction of truth in terms of supervaluations. Stephen Read traced ideas leading to a solution of several related paradoxes (Curry's, Field's, Pseudo-Scotus') based on revising the T-scheme, which can be found in works of medieval philosopher Thomas Bradwardine.

Among others, we have to mention the excellent performance of Greg Restall ("Always More"), who showed some impressive tricks with his new unary propositional operator, defined as a counterexample to the standard possible worlds account of propositions. Heinrich Wansing and Yaroslav Shramko ("The Slingshot Argument and Sentential Identity") inquired into the possibility of proving the Fregean Axiom in non-Fregean logic and opened an interesting perspective on the famous Slingshot argument. Sebastian Sequoiah-Grayson ("Ajdukiewicz Functions and Basic Inference") employed the idea of interaction between information states in a single agent deductive setting, with the intention to resolve the problems that are connected with the epistemic interpretation of the K axiom. Michal Peliš and Ondrej Majer ("Logic of Questions from the Viewpoint of Dynamic Epistemic Logic") sketched a formal analysis of the role of questions in the process of communication that combines the Logic of questions with the Dynamic Epistemic Logic.

As it is impossible to mention all the notable lectures that were presented, we have to be selective, but the following ones deserve to be mentioned at least in a few words: Tomasz Placek ("On Attempting") analyzed the concept of attempting in the stit framework and Lionel Shapiro ("Deflating Logical Consequence") considered the possibility of a deflational attitude towards the concept of logical consequence. Curtis Franks' paper ("Reasoning about Meta-Theory in Weak Theories") concentrated on the idea of using weak theories of arithmetic to separate meta-theoretical notions that stronger theories fail to distinguish. Marie Duží ("Tenses and Truth-Conditions: A Plea for If-Then-

Else") provided an analysis of sentences with presuppositions in the framework of Transparent Intensional Logic, employing the "if-then-else" connective.

A selection of the papers presented at the symposium, both mentioned and not mentioned in this short note, will appear in the Logica 2009 Yearbook, which will be published next spring by the College Publications.

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Department of Logic and Methodology of Sciences,
Comenius University, Bratislava

Juraj Podroužek
Department of Analytic Philosophy,
Institute of Philosophy, Bratislava

European Computing and Philosophy, 2–4 July

The Seventh ECAP (European Computing and Philosophy) conference was organized and directed by Jordi Vallverdú at Autonomous University of Barcelona. The conference started with the IACAP (The International Association for CAP) presidential address from Luciano Floridi, this year focusing on mechanisms of knowledge production in informational networks.

The first keynote delivered by Klaus Mainzer made a perfect frame for the rest of the conference, by elucidating the fundamental role of complexity of informational structures that can be analyzed on different levels of organization giving place for variety of possible approaches which converge in this cross-disciplinary and multi-disciplinary research field.

Here is the Jordi Vallverdú's short account of the conference:

"As Chair of the ECAP09 conference, I have in my mind one idea: quality. We had a great Program Committee, an excellent Track Chairs team and 5 superb Keynote Speakers. Moreover, more than 140 papers were sent and we had a hard selection process. Finally, best researchers from more than 20 countries all around the world made the ECAP09 conference a high-quality academic event.

Especially, I want to mention the five keynotes: Klaus Mainzer, who spoke about complexity, Kevin Warwick about re-embodiment of rats' neurons into robots, Raymond Turner on syntax and semantics in programming languages, Roderic Guigó on Biocomputing Sciences and Francesc Subirada on the past and future of supercomputing; five speeches about different topics around philosophical as well as practical aspects of computer sciences.

I'm really proud of the conceptual range achieved by keynotes: from theory to practice, describing an intellectual path across several disciplines and specialties. As with previous ECAP conferences, we created working bridges between research fields."

Along with great keynotes I want to bring up excellent tracks with inspiring and informative presentations: Philosophy of Information (Patrick Allo), Philosophy of Computer Science (Raymond Turner), Computer and Information Ethics (Johnny Søraker and Alison Adam), Computational Approaches to the Mind (Ruth Hagengruber), IT and Cultural Diversity (Jutta Weber and Charles Ess), Crossroads (David Casacuberta), Robotics, AI & Ambient Intelligence (Thomas Roth-Berghofer), Biocomputing, Evolutionary and Complex Systems (Gordana Dodig Crnkovic and Søren Brier), E-learning, E-science and Computer-Supported Cooperative Work (Annamaria Carusi) and Technological Singularity and Acceleration Studies (Amnon Eden). These last tracks are new to this conference and they attracted a great deal of interest. The singularity studies especially stimulated vivid discussions. We hope to see those new tracks continue in the coming CAP conferences.

Apart from the admirable conference programme we must acknowledge the great venue, beautiful city of Barcelona, smooth organization, and fun gala dinner with delightful musical display.

"Jordi did, indeed, do an outstanding job. Everyone I have spoken to has declared ECAP'09 a success! We are back to being a 100+ attendants conference. We are in good shape now to continue the series, with ECAP10 in Munich, Germany; ECAP11 in Aarhus, Denmark; ECAP12/IACAP12 in Reading, UK, and ECAP13 in Ankara, Turkey. May they all be as great!" said Philip Bray, Regional Director of European CAP.

For more details about ECAP09 please see here.

Gordana Dodig Crnkovic
School of Innovation, Design and Engineering
Mälardalen University, Sweden

Intelligent Computer Mathematics, 5–12 July

From the 5th to the 12th of July, 2009, Calculemus and MKM (Mathematical Knowledge management) were co-located to form CICM'09 (Conference on Intelligent Computer Mathematics) in Grand Bend, Ontario, Canada. In addition to Calculemus and MKM, the CICM conference also included 6 smaller workshops on computer algebra, user interfaces for mathematical tools, and presentation standards and tools for mathematics.

Calculemus is a series of conferences dedicated to the integration and interaction of techniques and tools from computer algebra and proof systems. This year's con-

ference saw talks on reasoning about abstract matrices, differential operators, Laurent polynomials, correctness of software, data transformations, boolean derivatives, and quantum information. The MKM conference concerns the management of mathematical knowledge and included talks on the correctness and understanding of mathematics, the teaching of mathematics and how it can be aided by reasoning tools, the interpretation of natural language within more formal systems, and applications of automated reasoning to Spreadsheets.

Of particular interest to the Reasoner, were the plenary talks of Rob Arthan, Jacques Calmet, and Georges Gonthier. Rob Arthan's talk on "Computational Logic and Continuous Mathematics, Pure and Applied", highlighted the growing importance of reasoning for continuous domains. He presented some theoretical foundations and applied techniques for reasoning in continuous mathematics, describing the state of the art and challenges for the future. Jacques Calmet's talk, "Abstraction-Based Information Technology: A Framework for Open Mechanized Reasoning", pointed out the wide range of fields that could benefit form computer-assisted reasoning and how we might move into a brighter future through the continued development of this field. Georges Gonthier's invited talk, "Software Engineering for Mathematics", raised the question of why mathematicians rarely use proof assistants. He suggested that the ability to apply and combine abstractions in creative and elegant ways is essential. He then described the role of dependent type theory and reflection to tackle these issues in his ongoing work on computer verification of Finite Group Theory which has some of the largest proofs in mathematics.

We are already looking forward to next year's CICM in France...

Lucas Dixon
School of Informatics, University of Edinburgh

The Metaphysics of Consciousness, 7–9 July

A conference on consciousness and its place in nature was held at the University of Edinburgh in honour of the late Timothy L.S. Sprigge (1932-2007)—former Professor of Logic and Metaphysics in the years 1979-1989. This was the annual Royal Institute of Philosophy Conference and was co-sponsored by the British Society for the History of Philosophy, the Mind Association, the Scots Philosophical Club and the University of Edinburgh. Besides being a leading international authority on the thought of such philosophers as Francis Herbert Bradley, George Santayana and William James and a forceful advocate of animal rights, Professor Sprigge was a unique appearance on the philosophical stage in that he was both willing and able to develop a comprehensive metaphysical system in the grand style of the philosophers he most admired. In *The Vindication of Absolute Idealism* (1983), he combined elements from the philosophies of Bradley, James, Berkeley and Spinoza to develop a novel argument in support of the idealist view that nature is the appearance to us of a plurality of centres of experience, each of which he conceived in Spinozistic fashion as a mode of a larger overarching reality, the Absolute.

Most philosophers today would regard such speculations as lying beyond the power of human reason, yet Professor Sprigge developed his argument on the basis of an insightful analysis of the phenomena of consciousness and it is here that his thought more directly connects with current academic concerns. To give an idea of the significance of his work, it suffices to say that he anticipated by a few years Nagel's famous 'What-is-it-like-argument' against physicalism, although they reached the conclusion independently from one another. It was the recognition of the reality of subjectivity that led Professor Sprigge to reject all forms of materialism and eventually to advocate a form of panpsychism, a view that has gained new currency in recent debates on the philosophy of mind.

The conference featured 22 speakers. These were (in rigorous alphabetical order) Fred Adams, Ken Aizawa, Brenda Almond, Pierfrancesco Basile, Jason Brown, Andy Clark, Stephen Clark, David Cockburn, Tim Crane, Barry Dainton, James Giles, Alastair Hannay, Jaegwon Kim, Julian Kiverstein, Geoffrey Madell, Eduard Marbach, Leemon McHenry, Brian McLaughlin, Howard Robinson, William Seager, Peter Simons and Galen Strawson. A wide variety of positions was represented, such as the extended-mind hypothesis, the identity-theory, panpsychism and even the much vituperated Cartesian dualism. Although most of the papers were technical in character, discussion was not reduced to a narrow consideration of small points of detail and never lost contact with the main philosophical issues. The conference also aimed at showing the relevance of great masters of the past for contemporary philosophy of mind. This aim was at least partially achieved, as several speakers made constructive use of ideas drawn from works by Whitehead, James and Husserl.

The conference was very well attended over the three days and debate was conducted in a critical yet friendly atmosphere. Needless to say, consciousness's place in nature remains mysterious; for those who missed the event but are interested in knowing how much light has been shed on its subject, a selection of the conference's papers will be published by the Royal Institute at the Cambridge University Press as a special number of the

Institute's journal, *Philosophy*.

Pierfrancesco Basile
Philosophy, Bern, Switzerland

Jesper Kallestrup
Philosophy, Edinburgh

Julian Kiverstein
Philosophy, Edinburgh

Leemon McHenry
Philosophy, Northridge, California

Pauline Phemister
Philosophy, Edinburgh

Automated Reasoning about Context and Ontology Evolution, 11–12 July

Over the last fifteen years, the word 'ontology' has been recycled by the computer science community to mean the (usually logical) formalisations of knowledge used by computing applications. Contexts play a key role in ontologies such as: the sub-ontologies into which a large ontology is modularised; different views on a multi-use ontology; representions of hypothetical or fictional situations; or representions of the current situation. The logics used to encode ontologies tradeoff expressiveness against computational complexity. As the Semantic Web standard, the World Wide Web Consortium have adopted the OWL family of description logics (DLs), which are decidable fragments of first-order logic.

Ontologies change because new needs arise or because knowledge evolves. Managing such change was the topic of ARCOE-09 (Workshop on Automated Reasoning about Context and Ontology Evolution), held on 11-12 July 2009 in Pasadena, California, at the International Joint Conference on Artificial Intelligence. The two-day workshop had three tracks: *common sense and non-monotonic reasoning for ontologies*; *context and ontology*; and *automated ontology evolution*, although there was a great deal of overlap between these themes. It also included two invited talks and a panel discussion.

In his invited talk, Baader gave a short survey of DLs, focusing on the $\mathcal{EL}$ family. Three of the contributed talks in the common sense and non-monotonic reasoning track, by Wang, Wassermann and Varzinczak, (as well as Qi's talk in the context track) focused on adapting techniques from belief revision or forgetting to DLs, in particular to deal with ontologies that have become inconsistent. Moguillansky's talk, on the other hand, left ontologies inconsistent, but adapted ideas from argumentation theory to ensure that reasoning was safe.

The context and ontology track included a panel discussion on "The role of contexts in the evolution of ontologies—with an eye on scaling-up". The discussion was wide-ranging, including the variety of ways in which "context" is used and the role of non-monotonicity in representing contexts. In her invited talk, McGuinness described the Chimaera system for assisting users to construct and maintain ontologies. Three of the talks in this track, by Normann, Sboui and Redavid et al., looked at issues in the combination of multiple contexts. Ptaszynski's talk discussed the use of context to analyse and assess the appropriateness of the implicit emotions in an utterance.

Three of the talks in the automated ontology evolution track, by Bundy, Lehmann and Chan, concerned the GALILEO Project, in which ontologies representing physical theories are repaired in order to resolve conflicts with experimental data, especially where the repair involves a change in language and not just of belief. The remaining talk, by Jouis, Habib and Liu, concerned the adaption of topological ideas to the representation of atypical entities in a class, e.g., that they are on the boundary rather than in the interior.

There are plans to continue the ARCOE collaboration and to reach out to other communities interested in ontologies, contexts and reasoning.

Alan Bundy
School of Informatics, University of Edinburgh

Jos Lehmann
School of Informatics, University of Edinburgh

Guilin Qi
Institute AIFB, Universität Karlsruhe, Germany

Ivan José Varzinczak
Meraka Institute, Pretoria, South Africa

Logical Methods for Social Concepts, 20–24 July

The workshop *Logical Methods for Social Concepts* (LMSC'09) organized by Andreas Herzig and Emiliano Lorini has been held during the European Summer School on Logic, Language and Information (ESSLLI'09) in Bordeaux. The main objective of the workshop was to study whether logical approaches developed in the multi-agent system (MAS) domain are adequate to express in an accurate way social concepts which are central both in computer science and in the

social sciences (e.g., power, cooperation, delegation, trust, convention, agreement, etc.). Twelve papers were selected for presentation focusing on five general issues:

- Game theory and social choice;
- Logics for mechanism design;
- Communication and speech acts;
- Individual attitudes;
- Group attitudes.

Two papers were focused on game theory and social choice. N. Dimitri in 'Cooperation with Time-Inconsistency' provides an explanation of how cooperation between agents could emerge in an Infinitely Repeated Prisoner's Dilemma, when individuals are time inconsistent and time inconsistency is formalized by the concept of quasi-hyperbolic discounting. Eckert & Herzberg in 'Systematic Judgment Aggregators: An Algebraic Connection between Social and Logical Structure' show how Boolean algebras can be used to understand the relation between the logical and the social structure of an aggregation problem.

Three papers were focused on issues related to mechanism design. Balbiani, van Ditmarsch and Seban in 'Reasoning about Permitted Announcements' present a normative extension of public announcement logic (PAL) which allows to express the concept of 'permission to say'. Dgremont & Kurzen in 'Expressivity and Complexity of Reasoning about Coalitional Interaction' study a general class of logics for reasoning about coalitional power in multi-agent systems. Finally, Gierasimczuk, Kurzen and Vélazquez-Quesada in 'Learning as Interaction' present an application of Sabotage Logic (Van Benthem, 2005) to learning theory in which learning is conceived as an interactive game between a teacher and a learner.

Three papers were focused on communication and speech act theory. The work by Genot & Jacot with title 'How Can Yes-No Questions Be Informative?' analyzes the informativeness of questions in the context of 'inquiry games' (Hintikka, 1999). Longin & Nguyen in 'Delegation as a Communicative Act: A Logical Analysis' present a logical analysis of the concept of delegation as a specific kind of speech act (Searle, 1969). Roussel & Cholvy in 'Cooperative Interpersonal Communication and Relevant Information' introduce a modal logic for reasoning about pragmatic relevance in multi-agent domains with several sources of information.

Broersen in 'First Steps in the STIT-logic Analysis of Intentional Action' presents an extension of STIT logic (Belnap et al., 2001) which allows to distinguish intentional from non-intentional actions.

Finally, two papers dealt with the concept of collective acceptance, that can be viewed as a 'rival' of common belief. Raimo Tuomela in 'Collective Acceptance and Its Logic' elucidates the main properties of acceptance as a fundamental concept for the analysis of groups and institutions. Negri & Hakli in 'Reasoning about Collectively Accepted Group Beliefs' propose a proof-theoretic method for the logic of acceptance recently developed by Lorini et al. (*Journal of Logic and Computation*, to appear).

Andreas Herzig and Emiliano Lorini
IRIT, Toulouse

International Conference on Biomedical Ontology, 24–26 July

Ontologies are being used in a variety of ways by researchers in almost every life science discipline, and their use in annotation of both clinical and experimental data is now a common technique in integrative translational research. Principles-based ontologies are being developed for the description of biological and biomedical phenomena of almost every different type. To be maximally effective, such ontologies must work well together. But as ontologies become more commonly used, the problems involved in achieving coordination in ontology development becomes ever more urgent. To address these problems there is a need for an overarching conference which brings together representatives of all major communities involved in the development and application of ontologies in biomedicine and related areas. ICBO (International Conference on Biomedical Ontology) is designed to meet this need.

ICBO took place in Buffalo, NY, from 24 to 26 July 2009, and was preceded by four days of tutorials and classes on different aspects of theoretical and applied ontological research. The conference was the first of its kind and brought together researchers across the biomedical spectrum. On the first day, five papers on the topic of ontology for chemistry and molecular biology were presented by (first authors): Hong-Sang Low, Colin Batchelor, Karen Eilbeck, Nico Adams, and Robert Hoehndorf. Ontological efforts supporting reasoning at multiple scales 'from cell to body' were presented by: Alexander Diehl, Mathhew Holford, Gwen Frishkoff, and Frederic Bastian. Disease ontologies were the final topic of the first day, with papers given by: Olivier Bodenreider, Pantelis Topalis, Geoffrey Frank, James Overton, Stefan Schulz, Albert Goldfain, and Werner Ceusters. The first day also included poster presentations, software demonstrations, and a panel discussion on the topic of "Ontology and Publishing".

The second day began with a session on creating ontologies that work together. Papers were presented

by: Christopher Mungall, Cliff Joslyn, Ward Blondé, John Gennari, Melanie Courtot, Pinar Oezden, Jyotishman Pathak, and Philippe Rocca-Serra. A session on clinical ontology included papers by: Manuel Möller, Rodolpho Freire, Martin Boeker, Megan Kong, Riichiro Mizoguchi, and Harold Solbrig. Another round of posters and software demonstrations preceded the keynote address by Harold Garner "Identifying Relations in Text: Applications to Generating and Verifying Hypotheses in Drug Discovery".

The final day included a session on computing with ontologies. Papers were presented by: Jesualdo Tomás Fernández-Breis, Cui Tao, Michael Bada, Sergei Nirenburg, Lam Tsoi, Daniel Schober, and Philippe Rocca-Serra. The conference concluded with a closing panel "Ontologies and Beyond".

Albert Goldfain
NCBO, University at Buffalo

Meaning, Understanding and Knowledge, 7–9 August

"Meaning, Understanding and Knowledge", the 5th international symposium Cognition, Logic and Communication was hosted by the Center for Cognitive Sciences and Semantics at the University of Latvia in Riga August 7 to August 9.

The primary topic of the conference was whether or not understanding a language is knowing what its sentences mean. What follows is a brief report on roughly half of the presentations given at the symposium. Jason Stanley opened the meeting with a keynote address that set the issues in broader philosophical and historical context, discussing the relationship between the use theory of meaning and issues of intercultural understanding in figures both of whom lived in Riga: Herder and Berlin. Stanley argued that the use theory of meaning makes translation a problematic affair and thereby fosters the view that cultural differences cannot be bridged.

During the body of the conference one topic that came to the forefront of discussion is whether or not understanding language is a perceptual capacity. Several talks covered this topic. Dean Pettit of the University of North Carolina defended his published views that neither knowledge nor belief are necessary for understanding language, while Mitch Green of the University of Virginia argued that Pettit's arguments fail to establish that knowledge is unnecessary for understanding and that the view that understanding is a perceptual matter fails because understanding is relevantly dissimilar to genuinely perceptual states. Douglas Patterson of Kansas State University, Barry C. Smith of Birkbeck College, Univeristy of London, and Guy Longworth of the University of Warwick also gave presentations that directly took this issue into account.

Other issues concerning the understanding of language were discussed as well by, among the others, Corine Besson of Oxford University, Thomas Kroedel of the University of Konstanz, and Thomas Hofweber of the University of North Carolina. Hofweber argued for his view that rules of inference are only generically valid and that recognizing this provides a solution to the semantic paradoxes by allowing that none of the rules of inference that figure in the paradoxical arguments is invalid, since generically valid rules of inference admit of exceptions.

Other topics included the relation between externalist theses about meaning and the thesis that understanding is knowledge of meaning, discussed by Panu Raatikainen of the University of Helsinki, the role of belief in semantic competence, discussed by Åsa Wikforss of the University of Stockholm, the notion of meaning in two-dimensional semantics, discussed by Derek Ball of the University of St. Andrews, Arché, fictionalism in semantics, discussed by James Woodbridge of the University of Nevada, and the ability of deflationists to understand attributions of truth to contents not fully understood, discussed by Gupreet Rattan of the University of Toronto. Papers by conference partcipants will be published in the 5th edition of the Baltic International Yearbook for Logic, Communication and Cognition.

Douglas Patterson
Department of Philosophy, Kansas State University

Responsible Belief in the Face of Disagreement, 18–20 August

Disagreement and the ethics of belief are two issues that show an interesting revival in epistemology during the last few decades. This conference aimed at drawing them together: what is responsible belief in the face of disagreement?

Bruce Russell (Wayne State University), 'Epistemic Disagreement', opened proceedings by arguing that known disagreement with a known epistemic peer always gives one some reason to lower one's confidence in the belief in question. However, given the fact that there can be epistemically equally good scales for weighing evidence, two epistemic peers can be rational in holding opposed beliefs on some issue. In philosophy, this kind of rational disagreement is rare, though. Most often the disputing parties either have slightly different evidence or they are less than perfectly rational.

Robert Audi (University of Notre Dame), 'The Ethics of Belief and the Morality of Action', argued that intellectual responsibility is not reducible to moral responsibility, but connected to it in different ways. Also, he argued that others things being equal, a rational con-

scientious attempt to establish the epistemic parity of a disputant tends to favor the conscientious inquirer who, on the basis of such an attempt, retains the belief that *p*. Finally, he distinguished six normative principles applicable to apparent peer disagreements, the most discussed of which was the *principle of asseverative caution*: other things being equal, a person who justifiably believes that an epistemic peer disbelieves *p* should not flatly assert that *p*.

René van Woudenberg (VU University), 'Responsible Belief in the Face of Disagreement', argued against David Christensen's two principles for assessing and reacting to explanations in cases of epistemic peer disagreement. Against the principle that one should assess explanations for the disagreement in a way that is independent of one's reasoning on the matter under dispute, Van Woudenberg argued that independency is not required for belief movement. The principle that to the extent that this sort of assessment provides reason to think that the explanation in terms of one's own error is as good as that in terms of one's peer's error, one should move one's belief towards one's friend's, faces problems that have to do with the involuntariness of belief and the threat of skepticism.

Richard Feldman (University of Rochester), 'Evidentialism, Higher-Order Evidence, and Disagreement', argued that the puzzles concerning responsible belief in the face of peer disagreement do not warrant abandoning evidentialism. Moreover, there are no true special epistemic status principles about doxastic responsibility in the face of disagreement other than the general evidentialist principle. Puzzles about peer disagreement are primarily puzzles about the evidential impact of higher-order evidence. Such evidence often has a serious impact on the justification of one's first-order beliefs.

In addition to the four keynote lectures, some fifty lectures were delivered in parallel sessions. This conference at the VU University Amsterdam was the second conference organized by the Knowledge, Belief, and Normativity Project. The organizers, Martijn Blaauw (VU), Anthony Booth (Utrecht), Rik Peels (Utrecht), Jeroen de Ridder (VU), and René van Woudenberg (VU), have scheduled another conference on doxastic responsibility at Utrecht University in 2010.

Rik Peels
Philosophy, Utrecht University

Calls for Papers

Robot Ethics and Human Ethics: Special issue of *Ethics and Information Technology*, deadline 1 September.

Logic and Social Interaction: Special issue of *Synthese KRA*, deadline 1 September.

New Worlds of Computation: Special issue of *International Journal of Unconventional Computing*, deadline 1 September.

Psychology and Psychologies: which Epistemology?: Special issue of *Humana.Mente*, deadline 5 September.

Normative Multiagent Systems: Special issue of *Journal of Algorithms in Cognition, Informatics and Logic*, deadline 15 September.

Peirce Essay Contest: On any topic on or related to the work of Charles Sanders Peirce, deadline 30 September.

Non-Classical Mathematics: Special issue of *Logic Journal of the IGPL*, deadline 30 November.

Ordinary Language Philosophy: A Reappraisal: Special Issue of *Essays in Philosophy*, deadline 31 December.

Philosophy of Life: An edited volume of unpublished articles, deadline 1 June 2010.

Experimental Philosophy: Forthcoming issue of *The Monist*, deadline April 2011.

§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

This Month on Logic and Rational Interaction (loriweb.org)

This month on `loriweb.org`, we are glad to present a list of women working in philosophy of logic and philosophical logic compiled by Catarina Dutilh Novaes drafted on the basis of responses prompted by her query on Philos-l. The point in putting forth the query and now presenting the current result is to counter "logic is for boys" stereotype. The present version can be found at here, where you may also find a list of women working in related areas, also compiled by Catarina Dutilh Novaes along with her contact information in case you should have further additions.

Continuing conference and workshop reports, Giuseppe Primiero and Patrick Allo have written a piece on the conference Computing and Philosophy:

E-CAP09 held at Universitat Autnoma de Barcelona, focusing on the two tracks Philosophy of Information and Philosophy of Computer Science.

Reporting on the two final sessions of the Amsterdam-based reading group "Bringing Logic to the Lab", Marian Counihan and Catarina Dutilh have respectively written about the reading group's discussions of papers by J. Szymanik and M. Zajenkowski and F.J. Pelletier, R. Elio and P. Hanson. Trying something new this summer, LORI have also gotten reports from some of this years summer schools, and so far Jeremy Avigad has reported on Carnegie Mellon Summer School in Logic and Formal Epistemology.

Further, reports have started coming in from LORI-relevant courses at this years European Summer School in Logic, Langugae and Information (ESSLLI '09), where Joshua Sack has reported on his and Eric Pacuit's course "Reasoning with Probabilities", Arnon Avron and Beata Konikowska on their course "Non-deterministic Multi-valued Logics" and finally Andreas Herzig and Emiliano Lorini on their course "Individual and collective intentionality".

As the new academic year commences and daily tasks reemerge, you can still get you `loriweb.org` news fast and easy—either by signing up to recive a newsletter or by subscribing to the LORI RSS feed. I finally remind you that we welcome any contributions relevant to our theme, and that we are also constantly looking for new collaborators. If you would like to join the team, of if you have information to share with the broader research community, please do not hesitate to contact our web manager, Rasmus Rendsvig.

Rasmus K. Rendsvig
Web manager, `loriweb.org`

§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. If you would like to contribute, please click here for more information. If you have feedback concerning any of the items printed here, please email features@thereasoner.org with your comments.

Intuitionism

Intuitionism is a school in the philosophy of mathematics founded by the Dutch mathematician L. E. J. Brouwer. According to Brouwer, mathematics is a creation of the mind: only mathematical objects that can actually be constructed can be said to exist. Brouwer grounded the existence of the natural numbers in our *intuition* of the movement of time: to the intuition of what once was corresponds the number 1; to the intuition of what once was and of what now is corresponds the intuition of the number 2; and so on. The truth of a mathematical statement is itself equated with the actual existence of a proof, in stark contrast with realist view that the truth of a mathematical statement consists in its correspondence with an independent mathematical reality.

The so-called Brouwer-Heyting-Kolmogorov (BHK) clauses for the logical constants provide an informal characterization of the intuitionist notion of proof. The notion of a proof for atomic statements is taken as basic, and the proof-conditions for complex statements are defined in terms of the proof-conditions of their constituents. For the propositional case: a proof of a conjunction $A \wedge B$ is given by presenting a proof of A and a proof of B, a proof of $A \wedge B$ is given by presenting either a proof of A or a proof of B, a proof of $A \to B$ is a construction that allow us to convert any proof of A into a proof of B; there is no proof of ∞ (where ∞ is a necessarily false proposition, e.g. $0 = 1$).

The BHK semantics validates intuitionistic, but not classical, logic. The Law of Excluded Middle fails, since for all we know, it is not the case that, for every statement, either it or its negation has a proof. Other notable casualties include Indirect Proof and Double Negation Elimination: from the fact that $\neg A$ has no proof, it does not follow that A itself has a proof.

Julien Murzi
Philosophy, Sheffield

Lewis Carroll

Pen name of Charles L. Dodgson (1832-1898). British logician better-known for his widely quoted 'Alice' tales. He published 'The Game of Logic' (1886) and 'Symbolic Logic: Part 1' (1896). Fragments of 'Part 2' appeared in 1977. He invented rectilinear diagrams for solving syllogisms and pioneered the use of trees to test the validity of sorites. He is best remembered for two papers in the journal Mind: 'A logical paradox' (1894) and 'What the Tortoise said to Achilles' (1895). The latter is often considered as the best exposition of the difference between a premise and a rule of inference.

Amirouche Moktefi
IRIST, Nancy

§6
Events

September

Systems Research: Lessons from the Past - Progress for the Future: St Anne's College, Oxford University, UK, 1–2 September.

Foundations of Uncertainty: Probability and Its Rivals, Villa Lanna, Prague, Czech Republic, 1–4 September.

Trends in Logic VII: Trends in the Philosophy of Mathematics, Goethe-University Frankfurt, 1–4 September.

NZSA: New Zealand Statistical Association Conference 2009, Victoria University of Wellington, 2–3 September.

WNPDE: Workshop in Nonlinear Elliptic PDEs, Université Libre de Bruxelles, Belgium, 2–4 September.

SOPHA: Triannual congress of the SoPhA, the Société de Philosophie Analytique, University of Geneva, 2–5 September.

Dispositions Workshop: Seoul National University and Kyung Hee University, South Korea, 2–5 September.

The Berlin Group: Knowledge, Probability, Interdisciplinarity: Paderborn, Germany, 3–5 September.

BLC: British Logic Colloquium, Department of Computer Science, Swansea University, Wales, UK, 3–5 September.

CMM: Centre for Metaphysics and Mind Graduate Conference, University of Leeds, 4 September.

Conditionals and Conditionalization: Centre for Logic and Analytic Philosophy, Institute of Philosophy, University of Leuven, Belgium, 4–6 September.

Mathematics, Physics and Philosophy: in the Interpretations of Relativity Theory, Budapest, 4–6 September.

Naturalism and the Mind: Kazimierz Dolny, Poland, 4–8 September.

Agency and Control: Psychological and Philosophical Perspectives: Behavioural Science Institute, Radboud University Nijmegen, 7 September.

MoMo: Learning Monotone Models From Data, Workshop at ECML PKDD 2009, Bled, Slovenia, 7 September.

CSL: 18th EACSL Annual Conference on Computer Science Logic, Coimbra, Portugal, 7–11 September.

MALLOW: Multi-Agent Logics, Languages, and Organisations Federated Workshops, Torino, Italy, 7–11 September.

Statistics in a Changing Society: RSS Annual Conference, Edinburgh, 7–11 September.

UC: 8th International Conference on Unconventional Computation, Ponta Delgada, Portugal, 7-11 September.

Self-Locating Attitudes: MIT/Jean Nicod Conference, Department of Linguistics and Philosophy at MIT, 8–9 September.

OR: University Warwick, 8–10 September.

CLIMA: 10th International Workshop on Computational Logic in Multi-Agent Systems, Hamburg, Germany, 9–10 September.

Mechanisms and Causality in the Sciences

University of Kent, Canterbury, UK, 9–11 September

Phloxshop II: Humboldt-Universität, Berlin, 9–11 September.

MATES: Seventh German Conference on Multi-Agent System Technologies, Hamburg, Germany, 9–11 September.

Ecos de Darwin: São Leopoldo, state of Rio Grande do Sul, Brazil, 9–12 September.

Darwin's Impact on Science, Society and Culture: Braga, Portugal, 10–12 September.

MOCA: 5th International Workshop on Modelling of Objects, Components, and Agents, Hamburg, Germany, 11 September.

Metacognition, Belief Change and Conditionals: Department of Philosophy and Institute for Advanced Studies, University of Bristol, 11–12 September.

Folk Psychology, Folk Epistemology and Cultural Transmission: Culture and the Mind Project Conference, University of Sheffield, 11–13 September.

FICS: 6th Workshop on Fixed Points in Computer Science, Coimbra, Portugal, 12–13 September.

MoS: Grand Finale Conference of the Metaphysics of Science AHRC Project, Nottingham, 12–14 September.

Incarnation: Perspectives from the Philosophy of Mind: University of Oxford, 14–16 September.

S.Co.: Complex Data Modeling and Computationally Intensive Statistical Methods for Estimation and Prediction, Politecnico di Milano, Italy, 14–16 September.

The New Ontology of the Mental Causation Debate: Old Shire Hall, Durham University, 14–16 September.

GAP.7: 7th International Conference of the Society for Analytic Philosophy, Bremen, 14–17 September.

ISMIS: The Eighteenth International Symposium on Methodologies for Intelligent Systems, University of Economics, Prague, Czech Republic, 14–17 September.

ESSA: 6th European Social Simulation Association Conference, University of Surrey, Guildford, 14–18 September.

LPNMR: 10th International Conference on Logic Programming and Nonmonotonic Reasoning, Potsdam, Germany, 14–18 September.

SASO: 3rd IEEE International Conference on Self-Adaptive and Self-Organizing Systems, San Francisco, California, 14–18 September.

Fictionalism: Manchester, 15–17 September.

KI: 32nd Annual Conference on Artificial Intelligence, Paderborn, Germany, 15–18 September.

WI-IAT: IEEE/WIC/ACM International Conferences on Web Intelligence (WI'09) and Intelligent Agent Technology (IAT'09), Milano, Italy, 15–18 September.

Complex Systems and Changes: Darwin and Evolution: Nature-Culture Interfaces, Sant Feliu de Guixols, Spain, 15–20 September.

Artificial by Nature: 4th International Plessner Conference, Erasmus University, Rotterdam, 16–18 September.

FroCoS: Frontiers of Combining Systems, Trento, Italy, 16–18 September.

History of Statistics and Probability: Santiago de Compostela, Galicia, Spain, 17–18 September.

Progic
4th Workshop on Combining Probability and Logic, special focus: new approaches to rationality in decision making, Groningen, The Netherlands, 17–18 September

Reductionism, Explanation and Metaphors in the Philosophy of Mind: Universität Bremen, 17–18 September.

ENFA: 4th meeting of the Portuguese Society for Analytic Philosophy, University of Évora, Portugal, 17–19 September.

Forecasting & Time Series Predictions with Artificial Neural Networks: Wallenberg Centre, Institute of Advanced Study Stellenbosch University, South Africa, 17–19 September.

Logic, Language, Mathematics: A Philosophy Conference in Memory of Imre Ruzsa, Budapest, 17–19 September.

Evolution, Cooperation and Rationality: Bristol, 18–20 September.

ICAPS: 19th International Conference on Automated Planning and Scheduling, Thessaloniki, Greece, 19–23 September.

Applied Statistics: Ribno (Bled), Slovenia, 20–23 September.

ECCS: European Conference on Complex Systems, University of Warwick, 21–25 September.

Philosophy of Probability Mini Conference: Faculty of Philosophy, University of Oxford, 24–25 September.

International Darwin Conference: Norcroft Centre, University of Bradford, 24–26 September.

Humanities and Technology Annual Conference: Special Topic: Technology, Democracy, and Citizenship, University of Virginia, 24–26 September.

Conversations on Method in Practical Philosophy: University of Bern, 25–26 September.

LACSI: The Logic and Cognitive Science Initiative Conference on Ontology, North Carolina State University, 25–26 September.

SYNASC: 11th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, Timisoara, Romania, 26–29 September.

Cognitive Approaches to Philosophy of Science and Technology: NFWT Workshop, Ravenstein, The Netherlands, 28–29 September.

ICTCS: 11th Italian Conference on Theoretical Computer Science, Cremona, Italy, 28–30 September.

KES: Knowledge-Based and Intelligent Information & Engineering Systems, Santiago, Chile, 28–30 September.

Philosophy for Science in Use: Scandic Linköping Väst, Sweden, 28 September – 2 October.

ASCS: The 9th conference of the Australasian Society for Cognitive Science, Macquarie University, Sydney, 30 September – 2 October.

October

Amsterdam Graduate Philosophy Conference: Universiteit van Amsterdam, 1–3 October.

Joint Attention: Developments in Developmental and Comparative Psychology, Philosophy of Mind, and Social Neuroscience, Bentley University, Greater Boston, 1–4 October.

Buffalo All X-Phi Weekend: University at Buffalo, 2–3 October.

Paradigms of Model Choice: 3rd Young European Statisticians Workshop, Eindhoven, NL, 5–7 October.

IC3K: International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management, Madeira, Portugal, 6–8 October.

The Normativity of Belief and Epistemic Agency: Instituto de Investigaciones Filosóficas, UNAM, México City, 8–9 October.

A Priori Workshop: University of Nottingham, 9 October.

Hugh MacColl Centenary: Boulogne sur Mer, 9–10 October.

Boulder Conference on the History and Philosophy of Science: University of Colorado at Boulder, 9–11 October.

MWPMW: 10th annual Midwest PhilMath Workshop, University of Notre Dame, 10–11 October.

IMCSIT: International Multiconference on Computer Science and Information Technology, Mragowo, Poland, 12–14 October.

Pascal2: Workshop on Spatiotemporal Modelling, Edinburgh, 12–14 October.

EPIA: 14th Portuguese Conference on Artificial Intelligence, Universidade de Aveiro, Portugal, 12–15 October.

Linguistic Intuitions Workshop: Oslo, 15–16 October.

Case Studies of Bayesian Statistics and Machine Learning: Carnegie Mellon University, Pittsburgh, PA, 16–17 October.

The Background of Institutional Reality: Inaugural Meeting of the European Network on Social Ontology, University of Constance, Germany, 16–17 October.

Philosophy of Medicine Roundtable: EIPE, Erasmus University Rotterdam, The Netherlands, 19–20 October.
Breaking Down Barriers: Blackwell Compass Interdisciplinary Virtual Conference, 19–30 October.
P-NPMW: Paris-Nancy PhilMath Workshop, Nancy, 21–22 October.
EPSA: 2nd Conference of the European Philosophy of Science Association, 21–24 October.
Understanding Mental Disorders: 12th International Conference for Philosophy and Psychiatry, Lisbon, Portugal, 22–24 October.
Science and Nonduality: San Rafael, California, 22–25 October.
Judgement and Truth in Early Analytic Philosophy and Phenomenology: University of Zürich, 23–25 October.
The Logic of Denial: Foundations of Logical Consequence Workshop, St Andrews, Scotland, 24–25 October.
RR: Third International Conference on Web Reasoning and Rule Systems, Chantilly, Virginia, USA, 25–26 October.
Law and Neuroscience: Acquafredda di Maratea, Italy, 26–31 October.
Constructive Mathematics: Workshop and AMS Special Session, Florida Atlantic University, 28 October - 1 November.
Computing & Statistics: Cyprus, 29–31 October.
Darwin Conference: Chicago, Illinois, 29–31 October.
Knowledge and Performance in the Perception of Objects and Living Beings: ZiF, Bielefeld, Germany, 29–31 October.
Language, Epistemology and History: 2nd SIFA Graduate Conference, Bologna, Italy, 29–31 October.

November

Darwin in the 21st Century: Nature, Humanity, and God: University of Notre Dame, Indiana, USA, 1–3 November.
ACML: 1st Asian Conference on Machine Learning, Nanjing, China, 2–4 November.
ICMI-MLMI: 11th International Conference on Multimodal Interfaces and Workshop on Machine Learning for Multi-modal Interaction, Boston, 2–6 November.
Logic, Epistemology, and Philosophy of Science: Universidad de los Andes, Bogotá, Colombia, 4–6 November.
AAAI Fall Symposium Series: Arlington, VA, 5–7 November.
Metaphysics: Fondazione Idente di Studi e di Ricerca, Rome, Italy, 5–7 November.
RuleML: 3rd International Symposium on Rules, Applications and Interoperability, Las Vegas, Nevada, USA, 5–7 November.
Concepts of Knowledge: Carleton University, Ottawa, Canada, 6–7 November.
AICI: Artificial Intelligence and Computational Intelligence, Shanghai, China, 7–8 November.
Arché Graduate Conference: CSMN, University of St Andrews, 7–8 November.
Epistemology, Context, and Formalism: Université Nancy 2, France, 12–14 November.
SPS: Science and Decision, Third Biennial Congress of the Societe de Philosophie des Sciences, Paris, 12–14 November.
M4M: 6th Workshop on Methods for Modalities, Copenhagen, Denmark, 12–14 November.
ICITE: International Conference on Information Theory and Engineering, Kota Kinabalu, Malaysia, 13–15 November.
VI Conference: Spanish Society for Logic, Methodology and Philosophy of Science, Valencia, Spain, 18–21 November.
LENLS: Logic and Engineering of Natural Language Semantics, Campus Innovation Center Tokyo, Minato-ku, Tokyo, 19–20 November.
Extended Mind: ZiF, University of Bielefeld, 23–25 November.
Knowledge, Value, Evolution: An international conference on cross-pollination between life sciences and philosophy, Prague, 23–25 Novermber.
NDNS+: Statistics and the Life Sciences: High-dimensional inference and complex data, Groningen, 23–25 November.
Spatial and Network Analysis in Qualitative Research: European University Cyprus, Nicosia, 25–27 November.
Cognitive Systems and the Extended Mind: Institute of Cognitive Science, University of Osnabrueck, 26 November.
ISKE: The 4th International Conference on Intelligent Systems & Knowledge Engineering, Hasselt, Belgium, 27–28 November.

December

MS: International Conference on Modelling and Simulation in Trivandrum, Kerala, India, 1–3 December.
Context and Levels of Locutionary Content: IFL, Universidade Nova de Lisboa, Lisbon, 3–4 December.
Human Nature, Artificial Nature: Genoa, Italy, 3–4 December.
(Dis)Entangling Darwin:Cross-Disciplinary Reflections on the Man and his Legacy: University of Porto, Portugal, 4–5 December.
MindGrad: Graduate Conference in the Philosophy of Mind, University of Warwick, 5–6 December.
ICDM: The 9th IEEE International Conference on Data Mining, Miami, 6–9 December.

NIPS: 23rd Annual Conference on Neural Information Processing Systems, Vancouver, B.C., Canada, 7–12 December.

Interpretation and Sense-Making: University of Rouen, France, 9–11 December.

NaBIC: World Congress on Nature and Biologically Inspired Computing, Coimbatore, India, 9–11 December.

New Trends in the Study of Implicatures: Formal Epistemology Project, Institute of Philosophy, University of Leuven, 10–11 December.

Emergence and Reduction in the Sciences: 2nd Pittsburgh-Paris Workshop, Center for Philosophy of Science, University of Pittsburgh, 11–12 December.

Subjective Bayes: CRiSM, University of Warwick, 14–16 December.

FIT: International Conference on Frontiers of Information Technology, Abbottabad, Pakistan, 16–18 December.

Seventeenth Amsterdam Colloquium: University of Amsterdam, 16–18 December.

EUMAS: 7th European Workshop on Multi-Agent Systems, Ayia Napa, Cyprus, 17–18 December.

MBR: Abduction, Logic, and Computational Discovery, Campinas, Brazil, 17–19 December.

ICCS: 10th Islamic Countries Conference on Statistical Sciences, New Cairo, Egypt, 20–23 December.

§7
Courses and Programmes

Courses

The Social Self: Summer School in Neuroscience and Philosophy of Mind, Alghero, Sardinia, Italy, 20–27 September.

Quantifying and Evaluating Forensic Evidence: Postgraduate Statistics Centre, Lancaster University, 24–25 September.

Statistical Learning and Data Mining III: Danube University Krems - Audimax, Krems / Donau, Austria, 25–26 September.

Small Area Estimation: Southampton Statistical Sciences Research Institute, 12–14 October.

Cluster Randomised Trials: University of Auckland, New Zealand, 25–26 November.

ISLA: 3rd Indian School on Logic and its Applications, University of Hyderabad, Gachibowli, India, 18–29 January.

Advanced Small Area Estimation: Southampton Statistical Sciences Research Institute, 15–16 February.

NASSLLI: 4th North American Summer School in Logic, Language and Information, Bloomington, Indiana, 21–25 June.

ESSLLI: European Summer School in Logic, Language and Information, University of Copenhagen, Denmark, 9–20 August.

Programmes

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 Metaphysics, Language, and Mind: Department of Philosophy, University of Liverpool.

MA in Rhetoric: School of Journalism, Media and Communication, University of Central Lancashire.

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 and Law.

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.

APTS: Academy for PhD Training in Statistics, University of Warwick.

§8
Jobs and Studentships

Jobs

Two Post-doc positions: to work on "Epistemology of the Large Hadron Collider", University of Wuppertal, Germany, deadline 1 September.

Post/doc position: "Integrated Modelling of European Migration", S3RI, Southampton, deadline 4 September.

Assistant Professor: AOS: Epistemology and Philosophy of Logic, AOC: Philosophy of Language, Old Dominion University, Virginia, deadline 15 September.

Professorship: in Logic and Epistemology, Faculty of Philosophy and Education, Ruhr-Universität Bochum, deadline 19 September.

Two Visiting Fellowships: for the year 2010–2011, in the Sydney Centre for the Foundations of Science, deadline 30 September.

VISITING INTERNATIONAL FELLOWSHIP: Department of Sociology, University of Surrey, Guildford, deadline 30 September.
POST-DOC POSITIONS: Instituto de Investigaciones Filosóficas, UNAM, Mexico, deadline 10 October.
POST-DOC POSITION: in philosophy of physics/ metaphysics at Monash University, deadline 23 October.
FACULTY POSITION: in Psychology, Centre for Cognitive Neuroimaging, University of Glasgow, deadline, 30 October.
HANS RAUSING PROFESSORSHIP: of History and Philosophy of Science, University of Cambridge, deadline 30 October.
TEMPLETON RESEARCH FELLOWSHIP: for the year 2010–2011, Oxford University, deadline 19 November.
LECTURESHIP: in the areas of Metaphysics and Epistemology, University of Melbourne, deadline 20 November.

Studentships

PHD STUDENTSHIP: "Multilevel Search Methodologies for Problem Solving", School of Computer Science, University of Nottingham, until filled.
PHD STUDENTSHIPS: in Complexity Science, EPSRC Complexity Science Doctoral Training Centre, University of Warwick.
PHD SCHOLARSHIP: in Computer Science and Economics, to work on the project "Epistemic states, trust and responsibility of economical agents: from theoretical aspects to experimental studies", Toulouse.
TWO PHD STUDENTSHIPS: in the areas of Perception and Philosophy of Mind, within the AHRC project "The Nature of Phenomenal Qualities", University of Hertfordshire, deadline 4 September.
DPHIL STUDENTSHIP: "Self-modelling for Control, Cognition, and Consciousness", Department of Informatics, University of Sussex, deadline 14 September.
TWO PHD STUDENTSHIPS: as part of the AHRC funded project "The Foundations of Structuralism", Department of Philosophy, University of Bristol, deadline 18 September.
PHD STUDENTSHIPS: in "Foundations of the Life Sciences and Their Ethical Consequences", European School of Molecular Medicine, Milano, deadline 27 September.
PHD STUDENTSHIP: in the Vidi project "A formal analysis of social procedures", Department of Philosophy and Tilburg Center for Logic and Philosophy of Sciences, deadline 15 October.
PHD SCHOLARSHIPS: in Machine Learning and Artificial Intelligence, ANU, Australia, deadline 31 October.