THE REASONER

Contents

Editorial

The epistemic regress problem, also known as Agrippa's trilemma, is one of the oldest problems in epistemology, dating back as it does to Aristotle and Sextus Empiricus. The trilemma can be summarized as follows: suppose that a subject, S, asserts a proposition, let us say, p. In that case it is possible to ask why she thinks that p is true. S should be able to give a reason, r_1, supporting the proposition p. However, for that reason, r_1, the same question can be asked: Why does she think that this reason is true? Moreover, it should be possible to give a further reason, r_2 etc.

In order to have a justification for a belief, there are three possible structures for the task of giving reasons. Either it stops at a certain point, or previous reasons are being restated, or the reason giving process is infinitely long. The first option has historically been the dominant position and is known as foundationalism. The second option is called coherentism and

has gained more adherents since the 20th century. However, it is the third option, epistemic infinitism, which will be discussed here.

Until very recently the viability of epistemic infinitism had been largely ignored. It seemed absurd to understand epistemic justification in terms of an infinite chain of reasons capable of supporting a certain belief. Most epistemologists acknowledged that infinitism was logically possible, but they thought it was so obviously false that they did not even try to invalidate it; they just ignored the infinitist option rather than offering counterarguments. The result is that epistemic infinitism as a theory has remained underdeveloped and its potential advantages have remained obscure.

It was Peter Klein who has changed this situation by mounting a defence of infinitism. He has been the first epistemologist to develop a more or less systematic theory of epistemic infinitism. He has attempted to show that infinitism is a workable account of epistemic justification, and even his opponents have been compelled to acknowledge that he has at least succeeded in showing that infinitism is not so obviously false as many had heretofore thought, and that there are rejoinders to what many people considered to be the strongest objections to infinitism (Gillett 2003, Bergmann 2007).

From the 1990's onwards he has published numerous articles on this topic in journals such as *Philosophical Studies*, *Philosophy and Phenomenological Research* and *Analysis*. Klein is convinced that infinitism offers a better alternative than the standard approaches to account for rational beliefs. His work has the merit that, while previous to his writings infinitism had

scarcely received careful consideration, now more and more people are working on the subject. Indeed, infinitism has acquired the status of a genuine alternative to the more commonly proposed accounts of justification.

I am very happy to introduce Peter Klein to you; he is currently professor at Rutgers University. In the following interview he discusses the evolution of epistemic infinitism, paying attention both to the past and the future of infinitism, and to the common features it has with the alternative solutions to the epistemic regress problem, as well as to the significant differences.

EVA MORRE
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FEATURES

Interview with Peter Klein

Eva Morre: At the time you wrote your first articles about epistemic infinitism, almost nobody was interested in this issue. How did the possibility of infinitism attract your attention?

Peter Klein: I would say that there have been many people interested in what has come to be known as infinitism, but almost exclusively as only a foil to their own views. Aristotle immediately comes to mind; and I think he set the tone of responses to infinitism for almost the next two and a half millennia!

You are right in implying that almost nobody thought infinitism was a plausible response to what is a central problem in epistemology—namely the epistemic regress problem. Aristotle has some historically interesting arguments against infinitism in the *Posterior Analytics* that could be generalized to all forms of reasoning, although they are framed specifically in terms of what he took to be the only form of reasoning that could produce inferential, scientific knowledge (i.e., the syllogism). Namely, if there is some knowledge resulting from reasoning from some premises, then the premises, themselves, must be known. And since the human mind, being temporally finite can only carry out a finite number of inferences, then some knowledge must be non-inferential. His so-called "finite mind" objection seemed insurmountable.

Indeed, at one point Aristotle treats infinitism and general skeptical worries on a par and dismisses both with not much more than a rhetorical flourish:

> There are ...some who raise a difficulty by asking, who is to be the judge of the healthy man, and in general who is likely to judge rightly on each class of questions. But such inquiries are like puzzling over the question whether we are now asleep or awake. And all such questions have the same meaning. These people demand that a reason shall be given for everything; for they seek a starting point, and they seek to get this by demonstration, while it is obvious from their actions that they have no such conviction. But their mistake is what we have stated it to be; they seek a reason for things for which no reason can be given; for the starting point of demonstration is not demonstration. (Aristotle 1011a2–14)

I'm familiar with that kind of reaction to the suggestion that questions can legitimately be raised about what we as a rule take for granted. When I first gave a paper attempting to develop and defend a version of infinitism, the first (rhetorical) question from the audience was, "You're kidding, right?" Foundationalism has ruled the roost by dominating the discourse.

But it seemed to me that there were some problems with foundationalism that have not been adequately addressed, and the finite mind objection struck me as based upon a conflation of propositional justification with doxastic justification. The infinitists' requirement that there be a limitless chain of propositions justifying a proposition should be seen as a requirement about the structure of adequate justificatory reasons (propositions which serve as criteria for the truth of other propositions for which they are the reasons); it should not be seen as a requirement of what a believer must do in order to justify his/her beliefs.

The short answer to your question is simply that the reigning proposal to solve the epistemic regress problem didn't seem so convincing to me and the primary objection to infinitism seemed based upon a mistaken identification of propositional justification with doxastic justification. Although I can put those thoughts relatively succinctly now, they state what was the nascent, and often not clear enough, idea behind the early papers.

EM: Should I see it as a clean break with your previous works or is your concern with epistemic infinitism more a logical consequence of your works concerning skepticism? How do you see the relationship between the two?

PK: Great question.

Logical consequence is too strong a connection, but the relationships between infinitism and skepticism are very interesting. Historically, of course, perhaps the *locus classicus* of the regress argument is Sextus's Chapter "The Five Modes" in his *Outlines of Pyrrhonism*. Sextus's use of the argument was in aid of his brand of Pyrrhonism. In that chapter it strikes me that he adopts Aristotle's rejections of infinitism and reciprocal or circular reasoning (which is permissible for a Pyrrhonian to do because he is employing an argument by *reductio* against what he labelled "dogmatism," and Aristotle was chief among the dogmatists) and gives his own reasons for rejecting Aristotelean foundationalism. That leaves only one option: skepticism—the view that no kind of reasoning can settle disputes about what Sextus called "non-evident" beliefs. I take it that "non-evident beliefs" are those beliefs which can become evident only if there is a process of reasoning which, if properly employed, provides an adequate basis for accepting the beliefs. The beliefs aren't evident on their face, so to speak. Non-evident beliefs need reasons in order to be epistemically acceptable.

There has been significant controversy about the scope of what the Pyrrhonians included among the evident propositions, and I'm not qualified to join that discussion about the meaning of the texts. (See *The Original Sceptics: A Controversy* by Myles Burnyeat and Michael Frede, Hacket Publishing Co., 1997.) The historical issue is whether beliefs about our mental

contents, or beliefs of any other type, have a sacrosanct status such that when we have those beliefs they do not require further reasons in order to be justified to the extent that they are certifiable as knowledge, if the other necessary conditions of knowledge are satisfied. And, equally important, even supposing that there were basic beliefs, could they be used to expand the scope of our justified beliefs?

Put a bit more simply: (1) are there basic beliefs and (2) can what are *called* basic beliefs be used to justify what are called non-basic beliefs? If the answer to either of those questions is "no," then foundationalism cannot supply a solution to the regress problem. I want to take up (2) first because the infinitist and Pyrrhonian part company on the answer to that question.

I think it is fairly clear, given Sextus's description of the Pyrrhonian discussions of the relativity of our perception both in the chapter on the five modes and the preceding chapters on the ten modes, that he thinks the correct description of the Pyrrhonian view is that the inferential move from basic propositions, if there are any, to claims about non-evident propositions is illegitimate. Simply put, the evident propositions cannot be employed in that manner because what is evident to a person at a given time can fail to be evident to that same person at another time or to another person at any time. Thus, being evident at a time is not a genuine criteria for the truth of non-evident propositions. Put another way, the supposed justificatory links between beliefs that allow us to justify a belief which otherwise would not be justified is an illusion.

(I might mention parenthetically that although my response to this question focuses on Pyrrhonian Skepticism, I think Cartesian Skepticism as developed in the *Meditations* can be seen in a similar way as challenging whether we have genuine criteria for accepting any belief. More specifically, the skeptical challenge that Descartes attempts to answer in the *Meditations* is to the legitimacy of clarity and distinction as a criterion of truth. But that's much too long and contentious of a story to go into here.)

Suppose that the Pyrrhonians were right that there are no criteria such that if C is a criterion for *p* (where *p* is a non-evident *a posteriori* proposition), then C provides some, at least prima facie, basis for believing that *p* and C does not provide an equally strong basis, of any sort, for believing that not-*p*. In more current language, a criterion for *p* is a sufficient defeasible reason for being justified in believing *p*. If there were no criteria, then there would be no genuine justificatory chains of reasons for our *a posteriori* beliefs. Hence, no non-skeptical account of reasoning (i.e., foundationalism, coherentism and infinitism) could effectively portray a way in which *the process of reasoning* could make an *a posteriori* proposition evident. The supposed justifying links to which we appeal are feckless. Further, given that the Pyrrhonian requirement for it being reasonable to accept a proposition is merely that the proposition be (a bit) more reasonable to believe than to deny, Sextus is describing a view that not merely holds that the scope of what is known is very limited, but he is describing a view in which what we are justified in believing is very limited. So, the Pyrrhonian answer to (2) is "no."

The infinitist parts company with the Pyrrhonian with regard to (2). Infinitism, per se, is not wedded to any particular theory of what makes one belief a criterial reason for another, but it does hold that there are chains of reasoning such that giving a criterial reason, C, for *p* does provide for a justification of *p* which can result in knowledge that *p*—assuming the other conditions of knowledge are satisfied. More about those other conditions of knowledge in a moment.

Infinitism, however, does accept the Pyrrhonian answer to (1). Infinitism holds that there are no basic beliefs—beliefs such that their justification does not depend upon there being further reasons for the belief. The primary argument for infinitism is that once the so-called basic proposition, call it *B*, is proffered by some person, call him/her S, there are clear contexts (philosophical ones and "ordinary ones") in which the following questions legitimately can be asked of S: Is S a good detector of the properties in virtue of which *B* is basic? And, are *B*-type propositions likely to be true in virtue of possessing those properties? I claim that if both answers are not "yes" and available to S, then S is not justified in believing *B* in the required sense that fulfils the necessary conditions of knowledge.

Some reliabilist foundationalists will claim that if the circumstances in which a belief arises are sufficiently conducive to producing true beliefs, then there is a clear sense in which S is justified in believing *B*. For the sake of the argument, and putting aside the generality problem for reliabilism, I am willing to grant that there is a sense in which S is justified in believing *B* just in case that there is an appropriately characterized set of circumstances specifying some etiology of the belief, *B*. But the sense of "justification" that I think is relevant—the sense in which beliefs need to be justified in order to be known—is the sense in which the justification that S employs makes a belief "the most highly prized form of true belief." (Plato, Meno 97a–98b). And if S possess such a reason then S is better off epistemically than any S* who does not possess such a reason. Between S and S*, only S can possess knowledge. S*'s belief falls short of knowledge. Our epistemic goal is neither just truth, nor just justified belief, nor even just true justified belief, but rather it is true, justified belief immune from genuine defeat. In other words, the epistemic goal is knowledge.

EM: Since the publication of your first articles about epistemic infinitism a lot has changed. Thanks to your efforts, the debate on infinitism has been engaged and both adherents and opponents of the view have contributed to the discussion. In what way did their contributions influence your views on epistemic infinitism?

PK: I am glad you see it that way. There is a nice website maintained by Andy Cling on Philpapers for infinitism. And soon there will be an annotated online bibliography for infinitism on Oxford Bibliographies Online maintained by John Turri and me. I mention those bibliographies so that your readers can have an entry point for examining the scope of what is now being done with regard to infinitism.

I think the commentators on various papers of mine have forced me to see the importance of the following points which I had not, and probably still have not, adequately addressed:

1. The distinction between doxastic and propositional justification is crucial and must be drawn carefully. The propositional chain had better be limitless if we are to be doxastically justified, but it does not follow that we have to produce such a chain in order to be doxastically justified.

2. Infinitism can appropriate the Wittgensteinian form of contextualism (see his *On Certainty*) in which a proposition is "bedrock" just in case it is what is typically taken for granted in the absence of reasons. For example, "the train schedule says the train leaves at 5 pm" provides a criterion for whether the train is scheduled to leave at 5 pm. Similarly, "it looks red to me and nothing seems amiss" is a criterial reason for believing

that it is red. But neither are, in principle, exempt from further interrogation. And an S with a further reason for believing that i) he/she can detect what the train schedule says or what kind of sensation he/she is having and ii) the train schedule is reliable or his/her classification of the sensations is likely to be correct, is epistemically much better off than an S* who does not have those reasons.

3. The point above can be put this way. The critics and supporters have made it more clear to me that justification is a many splendored thing and that the infinitist can grant many of the foundationalists' and coherentists' insights; and can even grant many of the insights of the Pyrrhonian Skeptic. Some propositions do have a privileged status *relative to the conversational context*; and there are reasoning chains in which *p* can be a reason for *q* and there are reasoning chains in which *q* can be a reason for *p*, but there is no acceptable reasoning chain in which they are mutual ancestors. (Because an acceptable reasoning chain raises the justificatory status of the belief for which the chain is created, and reciprocal chains cannot do that.) And, nothing is ever finally "settled."

4. The formal epistemologists have raised many interesting issues both in support and in criticism of infinitism. Frankly, that is an area I have not looked at carefully and I intend to do that.

EM: In your articles you often repeat that you do not have the intention to create a fully developed infinitist theory because your scope is merely to establish infinitism as a view which is worth exploring. Almost 15 years after the publication of your first article about epistemic infinitism, I would say you have definitely succeeded in placing infinitism in the spotlight. Now you have achieved your initial goal, what can we expect from your future works? And a related question: What role do you conceive for the epistemic infinitism of the future? Which are the most promising directions?

PK: Once again, I hope you are right and that infinitism is not just a passing fancy. Of course, I could go on and on about infinitism (!) but I see that we are getting very close to, or perhaps might have already exceeded, the limits of the interview and your readers' patience, so let me be brief here.

I think I have already partially addressed this question. It would be a good thing were the formal epistemologists to explore infinitism more fully. Jeanne Peijnenburg and David Atkinson have done some very interesting work and I hope they and other formal epistemologists will do more. I will (at least) watch as that develops.

I also think that looking at places where infinitism and the other responses to the regress problem share common ground is important because there might actually be less of a difference between those views—including the skeptical solution—than is typically appreciated. Maybe—*just* maybe at this point—infinitism can provide a rapprochement between the various solutions. We'll see.

Let me end by thanking you for the questions. They have pushed my thinking and I hope the answers are interesting to your readers.

Intuition Mongering

Philosophers often appeal to intuitions elicited by thought experiments. According to Bealer (1998: A Theory of Concepts and Concept Possession, *Philosophical Issues* 9, 261–301):

> For you to have an intuition that A is just for it to *seem* to you that A. Here 'seems' is understood [...] in its use as a term for a genuine kind of conscious episode [...] [T]his kind of seeming is *intellectual*.

Jackson's thought experiment (1982: Epiphenomenal Qualia *Philosophical Quarterly* 32, 127–136) is an example of an appeal to intuition:

> Mary is a brilliant scientist who is [...] forced to investigate the world from a black and white room via a black and white television monitor. She specializes in the neurophysiology of vision and acquires [...] all the physical information there is to obtain about what goes on when we see ripe tomatoes, or the sky, and use terms like 'red', 'blue', and so on [...] What will happen when Mary is released from her black and white room or is given a color television monitor? Will she *learn* anything or not?

Based on this case, Jackson argues as follows:

1. Before her release, Mary has complete physical information about human color vision.

2. But Mary learns something new upon her release.

3. (Therefore) What Mary learns upon her release must be non-physical.

The second premise implicitly relies on the following reasoning:

1. It seems to me that *p*.

2. (Therefore) *p*.

Bach calls this "default reasoning," which is based on his "take-for-granted rule" (1984: Default Reasoning: Jumping to Conclusions and Knowing When to Think Twice, *Pacific Philosophical Quarterly* 65, 37–58):

> (TFG) If it seems to me that *p*, then infer that *p*, provided no reason to the contrary occurs to me.

To Jackson (1982, 130), "*It seems just obvious* that [Mary] will learn something about the world," so he infers that Mary will learn something, and that is how he gets the second premise.

Now, I think there are relevant similarities between appeals to intuition and appeals to authority. Appeals to authority look roughly like this:

1. *E* is an expert on subject matter *S*.

2. *E* says that *p* (where *p* is a claim within the domain of *S*).

3. (Therefore) *p*.

For example:

1. The Surgeon General is an expert on public health.

2. The SG says that secondhand smoke can cause lung cancer.

3. (Therefore) Secondhand smoke can cause lung cancer.

Treatments of appeals to authority usually include two necessary conditions (Salmon, M. 2007: *Introduction to Logic and Critical Thinking*, Wadsworth, 118–120):

(a) The authority must be a genuine expert on S.

(b) There must be an agreement among experts on S concerning p.

If (a) and / or (b) are not met, then an argument from authority is weak (the premises of a weak argument provide weak support—or no real support—for the conclusion). If conditions (a) and (b) are met, then an argument from authority is strong (the premises of a strong argument provide strong support for the conclusion). In the SG case, conditions (a) and (b) are met, since the SG is an expert on public health and the relevant experts agree on the harmful effects of secondhand smoke.

Here is an example where condition (a) is not met:

1. Jenny McCarthy is a spokesperson for Generation Rescue.

2. JM says that MMR vaccines cause autism.

3. (Therefore) MMR vaccines cause autism.

Since JM is not an expert, an appeal to her "authority" on vaccines is weak. Here is an example where condition (b) is not met:

1. Brian Greene is a theoretical physicist.

2. BG says that an electron is a black hole.

3. (Therefore) An electron is a black hole.

Condition (b) is not met, since the notion of a black hole electron is controversial.

Now, just as appealing to experts is not a good way to resolve a dispute when the experts themselves disagree, appealing to intuitions is not a good way to resolve a dispute when philosophers have incompatible intuitions. After all, aren't appeals to intuition a form of appeals to authority? That is, a philosopher's intuition is supposed to be the final word about the case under consideration. More explicitly:

1. Appeals to authority, which are inferences from 'Expert E says that p' to 'p', are strong only if there is an agreement among experts on S that p (otherwise, appeals to authority are weak).

2. Like appeals to authority, appeals to intuition are inferences from 'It seems to Philosopher H that p' to 'p'.

3. (Therefore) Appeals to intuition are strong only if there is an agreement among philosophers on S that p (otherwise, appeals to intuition are weak).

Now, from this analogical argument and the assumption that philosophers are expert intuiters (cf. Weinberg, et al. 2010: Are philosophers expert intuiters? *Philosophical Psychology* 23, 331–355) the Principle of Agreement on Intuition (PAI) follows:

(PAI) When philosophers appeal to intuitions, there must be an agreement among the relevant philosophers concerning the intuition in question; otherwise, the appeal to intuition is weak.

To illustrate, Jackson's intuition that Mary will learn something new is not generally shared by philosophers working on this subject. For example, Dennett (1991: *Consciousness Explained*, Boston: Little Brown) and Hardin (1992: Physiology, Phenomenology, and Spinoza's True Colors, in A. Beckermann, H. Flohr, J. Kim, Berlin: De Gruyter (eds), *Emergence or Reduction? Essays on the Prospects of Nonreductive Physicalism*, Walter de Gruyter) think that, upon seeing red, Mary would say something like, "*Oh, so this is red.*" Since other philosophers don't share Jackson's intuition, condition (PAI) is not met, and so Jackson's argument is weak.

A referee suggested that appeals to intuition should be rejected altogether, since there is no reason to take even generally agreed upon intuitions as evidence. I agree. Since space is limited, however, an argument for this claim will have to wait. Here my claim is that (PAI) is a necessary, but not a sufficient, condition for strong appeals to intuition.

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Resolving an Inconsistent Triad Concerning Socrates on Harm and Wrongdoing

An engineering student recently pointed out a glaring inconsistency in the translations of *Apology* and *Crito* we used in our introductory philosophy course (2009: *Five Dialogues*, 2nd ed., trans. Grube, revised Cooper, Hackett). This student argued that Socrates commits himself to the following inconsistent triad:

1. Socrates cannot be harmed by his accusers. (*Apology* 30c)

2. His accusers do wrong to Socrates by prosecuting and punishing him unjustly. (*Apology* 30 d–e)

3. Doing wrong to a person is doing harm to a person. (*Crito* 49c)

To evade this inconsistent triad Socrates must either attenuate his claims about what his accusers could inflict on him, or he must retract the identification of wronging someone with harming that person. Whichever tack Socrates ought to take to avoid this inconsistency, letting it remain is out of the question. Inconsistency is the primary indicator of why a position ought to be rethought in the Socratic method of question and answer. For Socrates to commit himself to such a straightforward inconsistency would render him a fool who claims to know what he demonstrably does not know, and that would inflict on himself the worst sort of harm there is (*Crito* 44d).

Socrates commits to (1) in the following passage from *Apology*:

> Be sure that if you kill the sort of man I say I am, you will not harm me more than yourselves. Neither Meletus nor Anytus can harm me in any way; he could not harm me, for I do not think it is permitted that a better man be harmed by a worse; certainly he might kill me, or perhaps banish or disfranchise me, which he and maybe others think to be great harm, but I do not think so. (*Apology* 30c–d)

The underlined passage expresses (1), but before and after making that strong point about his immunity to harm Socrates also

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states weaker claims that the better can't be harmed by the worse, and that his accusers cannot harm him more than they harm themselves. But, those weaker claims are consistent with the stronger claim that Socrates is utterly immune to anything his accusers think is harmful because Socrates simply cannot be harmed by them at all. I think Socrates is committed to this stronger position, and shall hold him to it.

In the continuation of the above passage Socrates commits to (2):

> I think he is doing himself much greater harm doing what he is doing now, attempting to have a man executed unjustly. Indeed, men of Athens, I am far from making a defense now on my own behalf, as might be thought, but on yours, to prevent you from wrongdoing by mistreating the god's gift to you by condemning me. (*Apology* 30d–e)

By their unjust prosecution of Socrates, his accusers do wrong to Socrates, as do the Athenian jurors who vote for conviction. Socrates considers this injustice against him to amount to a mistreatment of him. But, as he had just said in the immediately preceding passage, mistreating him would not inflict any harm on him at all. Let us hold Socrates to this claim as well.

The remaining question raised by this inconsistent triad concerns how in his conversation with Crito about whether or not to escape from prison Socrates could seriously equate doing wrong to someone and inflicting harm on that person. Such a claim would fly in the face of his assertion in his trial of his immunity to whatever harms his accusers think they could inflict on him by their wrongful mistreatment of him. Surely his statements in court ought to be taken seriously as expressing deep commitments. But, Socrates also strongly commits to the point about wrongdoing that gives rise to (3):

> Socrates: Doing people harm is no different from wrongdoing. Crito: That is true. (*Crito* 49c)

Socrates insists shortly after establishing this claim "I have held it for a long time and still hold it now" (49e). So, what Socrates says here about wrongdoing is also non-negotiable. Is Socrates stuck holding a position in his conversation with Crito that he denied in court?

Not necessarily so, and to see why consider an alternate rendering of the same passage from *Crito* from an earlier printing of the same book (2002, *Five Dialogues*, 2nd ed., trans. Grube, revised Cooper, Hackett):

> Socrates: Mistreating people is no different from wrongdoing. (49c)

This alternate rendering does not commit Socrates to (3), but instead to quite a different claim:

4. Doing wrong to a person is mistreating a person.

Insofar as mistreating someone neither requires nor entails inflicting harm, then (4) is not inconsistent with (1) and (2). In fact, (4) simply expresses the very point Socrates made in his larger discussion of (1) and (2): though his accusers do mistreat him by perpetrating their unjust prosecution, they nonetheless shall not harm him. The problem here is that (4) reinforces (1) and (2), while (3) conflicts with (1) and (2). (And, this is why

my student's suggestion of this inconsistent triad was surprising: it did not exist in the version of the book I had used for nearly a decade.)

The choice of using "harm" for both the passages from *Apology* and from *Crito* is a matter of interpretation. The Greek words translated in terms of "harm" in *Apology* ($\beta\lambda\acute{\alpha}\pi\tau\omega$ and its cognate forms) are simply not used in *Crito*. And, while the Greek of *Crito* allows for a reasonable translation of this passage in terms of mistreatment or treating someone badly (from $\kappa\alpha\kappa\tilde{\omega}\varsigma$ and its cognate forms), it does not utterly disallow a rendering of the passage in terms of harming others. The shift from "mistreatment" to "harm" changed a quite sensible claim from Socrates wholly consistent with his positions in his court testimony (viz., 4) into a claim quite strikingly inconsistent with those claims (viz., 3). Why interpret that line from *Crito* in such a way as to hold Socrates to a blatant inconsistency especially when consistency is a clear and philosophically sound alternative? I know no good answers to that question. Of course, the problem exposed here would apply to any translation of *Crito* which likewise renders wrongdoing into something equivalent to harming (e.g., injuring, hurting) the recipient of the wrongdoing. Such translations needlessly impose the appearance of paradox on Socrates.

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News

Semantics and Pragmatics of Ceteris Paribus Conditions, 28–29 June

The workshop took place in Duesseldorf, June 28–29 2012, and was organized by Matthias Unterhuber and Alexander Reutlinger as a part of the DFG research group "Causation — Laws — Dispositions — Explanation". A special issue with contributions from the workshop will appear in *Erkenntnis*.

Many philosophers of science agree that a range of laws discussed in the special sciences (i.e., the life sciences and social sciences etc.) must be qualified by appeal to ceteris paribus (cp) conditions. While it has been often appreciated that ceteris paribus laws (cp laws) are needed, their exact nature, semantics, and pragmatics remains controversial.

Nancy Cartwright (LSE, UCSD) argued that causal laws require not only invariance under manipulation but must also be the result of the proper operation of a 'nomological machine'. Causal laws are, thus, invariant cp—i.e., conditional on the repeated proper operation of the machine. Alice Drewery (Reading) advocated an account of cp clauses in terms of Putnam's division of linguistic labor and argued that for that reason reductive accounts of cp clauses are bound to fail. Andreas Hüttemann (Cologne) presented a dispositionalist account of cp laws in physics. It is one advantage of his account that it predicts how systems would behave when disturbing factors were absent.

Bernhard Nickel (Harvard) and Jeff Pelletier (Alberta, SFU) focused on cp conditions in the context of generics (e.g., 'dogs bark'). Bernhard presented an account for generics, according to which generics involving non-kinds ('albino ravens') are based on generics regarding kinds ('ravens') so that generics hold if a suitable mechanism exists that issues the property in

question for some individuals of that kind. Jeff discussed non-monotonic inferences and cp conditions in the context of (deontic) generics and outlined a revised version of his and Nicholas Asher's formal semantics for generics.

Markus Schrenk (Cologne) and Matthias Unterhuber (Duesseldorf) focused on cp conditions and Lewis' best system account (BSA) of laws of nature. Markus presented his own 'better' BSA of special science laws. Matthias argued that there are non-epistemic reasons to suppose that laws of nature have cp conditions as specified by non-material conditional structures. To do so Matthias focused on Lewis' BSA which assumes perfect knowledge of the totality of facts.

Alexander Reutlinger's (Cologne) talk provided three objections to the statistical account of special science laws, according to which special science generalizations are understood as merely stating correlations without reference to cp conditions. Gerhard Schurz (Duesseldorf) argued that cp laws (other things being equal) are testable by randomized experiments whereas ceteris rectis laws (other things being right) are not. The latter correspond to causal influence assertions in causal graphs, and are best strengthened by the notion of evolution-theoretic normality. Wolfgang Spohn (Konstanz) advocated an epistemic account of cp conditions in terms of his ranking theory. Wolfgang showed how to model normal and (multiply) exceptional conditions in that framework. Michael Strevens (NYU) proposed a semantic framework for causal generalizations qualified by cp hedges. The truth conditions for such a causal generalization depend in part on the—perhaps unknown—nature of an underlying mechanism and the conditions under which the mechanism works. Brad Weslake (Rochester) focused on Albert and Loewer's mentaculus, which describes the fundamental physical laws of our world. Brad provided several arguments for the claim that the mentaculus approach cannot underwrite all special science laws.

MATTHIAS UNTERHUBER
Philosophy, Duesseldorf
ALEXANDER REUTLINGER
Philosophy, Cologne

Inductive Logic, 12–13 September

The new academic year kicked off with two reasoning highlights at the University of Kent.

From the 5th to the 7th of September the University of Kent hosted the Evidence and Causality in the Sciences conference—see *The Reasoner* 6(10).

The second event, organized by Jon Williamson from the Centre for Reasoning at the University of Kent, was a two-day workshop on "Inductive Logic" on the 12th and 13th of September 2012. Talks were given by members of the "Manchester School" of Pure Inductive Logic Alena Vencovská, Jeff Paris and George Wilmers and the "Canterbury School" of Inductive Logic, represented by Jon Williamson, Teddy Groves and Jürgen Landes. [See later in this issue for a brief introduction to inductive logic.]

Jeff Paris talked about a rational agent attempting to distinguish the real world among a set of possible worlds based on considerations of symmetry. Alena Vencovská followed up on this idea by showing how symmetry considerations lead to interesting results in non-unary pure inductive logic.

Jürgen Landes demonstrated how a rational agent may acquire probabilistic knowledge from a dialogue, where the speakers have their own agenda and thus may lie, be boundedly rational and may contradict each other. George Wilmers also discussed the aggregation of information from multiple sources. He showed how social entropy processes may be used combine collegiate subjective beliefs.

On a beautiful autumn morning Jon Williamson talked about the weather. He demonstrated how switching to probabilistic weather forecasts may lead ever more complicated formulations of forecasts. In particular, he wondered at which point further information may become unhelpful. In the final talk Teddy Groves discussed the principle of indifference and Bertrand's paradox.

The last afternoon was filled with a lively discussion comparing the approaches of the two schools to inductive logic. Advantages and disadvantages of these approaches were highlighted. However, a good part of the discussion was filled with exploring under which circumstances both approaches agree.

The workshop dinner gave ample time to discuss, among other pressing issues in inductive logic, the latest standings in the university tables and why no sensible policy maker should take the Shanghai Ranking seriously, (cf. Billaut et al. 2010: 'Should you believe in the Shanghai Ranking?' *Scientometrics* 84: 237–263).

The participants envisage getting together in the not so far future to discuss new developments and tantalizing open problems.

The workshop, besides the intrinsic value, also served as a kick-off meeting for the From objective Bayesian epistemology to inductive logic project. This three-year AHRC funded project is just getting started, stay tuned for updates. Everyone already owning a 2015 calender may want to circle the 20th to the 22nd of April 2015, when the Workshop series on *Combining Probability and Logic* (Progic) returns to Kent.

JÜRGEN LANDES
Philosophy, Kent

Formal Methods in Argument Reconstruction, 20–21 September

Funded by the German Science foundation and the University of Lund, Sweden, this meeting was held as a satellite workshop to the 9th triennial meeting of the German Society for Analytical Philosophy (GAP.8) at the University of Konstanz, Germany, comprising seven speakers, six commentators, and some 15 audience members.

Catarina Dutilh-Novaes (Groningen, The Netherlands) pointed out that already Aristotle's *Prior Analytics* (*Analytica Priora*) contains a wealth of neglected material on formalization; that is, on how ordinary language arguments may be regimented into a form that directly instantiates a syllogistic pattern of reasoning. The Aristotelian approach focuses on discussing paradigmatic examples of stumble blocks. It does not include a theory of formalizing or an effective procedure, which both remain desiderata.

In a case study addressing Leibniz's Monadology, Georg Dorn (Salzburg, Austria) presented a procedure for formalizing a complex argumentative text step by step, focusing on the

interplay between formalizing and selecting a target formalism and on revising preceding decisions in light of subsequent formalizations. These interdependencies call for shifting focus from formalizing individual sentences or arguments to formalizing entire theories.

Hans Rott (Regensburg, Germany) suggested a new approach to enthymemes, which uses techniques of belief revision and embeds the evaluation of enthymemes in a strategy of interpretation. Relying on the hermeneutic principle of charity, interpretation iteratively ascribes a belief state, which records whether the author endorses the premises and the conclusion. This state is then used to evaluate enthymemes, which may also trigger further revisions of the ascribed belief state.

Henry Prakken (Groningen, The Netherlands) applied the ASPIC framework to reconstruct and evaluate a policy debate about introducing mandatory minimum sentences. The ASPIC framework, mainly developed in AI, models natural language arguments as deductive or non-deductive premiss-conclusion-structures; it makes use of the Dung approach in order to evaluate debates that contain multiple pro and con arguments.

Thomas F. Gordon (Fraunhofer FOKUS, Berlin, Germany) presented a computational model of argument graphs, as well as the software system based on this model, called Carneades. It provides a formal, computational model of the kinds of argument schemes worked out in the "informal logic" tradition, and supports legal reasoning and argumentation, for applications in law and related domains, including public participation in policy-making (eDemocracy, eParticipation) and public administration (eGovernment).

Ulrike Hahn (Birbeck College, London) presented the Bayesian approach to natural language argumentation which promises to make better sense of what more classical treatments consider fallacious argument forms such as the *petitio principii* or the *ad ignorantiam*. Amongst others, the Bayesian approach provides reason to break with extant aggregation rules applied to plausible reasoning according to which conclusions cannot be more supported than the least supported premises.

Douglas Walton (Windsor, Canada) gave an overview of how to reconstruct and evaluated argumentation within his scheme based approach *cum* critical questions, exemplified by the argument from expert opinion and the argument from analogy. The use of such schemes becomes fallacious in a dialogue whenever these presumptive and defeasible forms are presented in an absolutistic and final manner.

The commentators were: Christoph Lumer (Sienna, Italy) on Hans Rott and Douglas Walton; Michael Baumgartner (Osnabrueck, Germany) on Tom Gordon; Friedrich Reinmuth (Greifswald, Germany) on Georg Dorn; and also included the workshop organizers: Gregor Betz (Karlsruhe, Germany) on Henry Prakken; Georg Brun (Zurich, Switzerland) on Catarina Dutilh Novaes, and Frank Zenker (Lund, Sweden) on Ulrike Hahn.

Gregor Betz
Philosophy, Karlsruhe Institute of Technology
Georg Brun
Environmental Philosophy, ETH Zurich
Frank Zenker
Philosophy and Cognitive Science, University of Lund

Philosophical Issues in Belief Revision, Conditional Logic and Possible Worlds Semantics, 21–22 September

Workshop at the GAP.8, 8th Conference of the Gesellschaft für analytische Philosophie (Society for Analytic Philosophy), Konstanz September 21–22 2012.

The present workshop took place from September 21 to 22 in Konstanz as a part of the GAP.8 and was organized by Matthias Unterhuber. The aim of the workshop was to bring together philosophers (related to the GAP, but not limited to it), who work in the area of belief revision, conditional logic and possible worlds semantics. The workshop served as a platform for the exchange of ideas from these related areas.

Holger Andreas (LMU Munich) gave an overview of his structuralist account of theory change, which allows one to integrate locally consistent but globally inconsistent scientific theories in a non-monotonic belief revision framework.

Igor Douven (Groningen) investigated the role of concessive (even if) as opposed to indicative conditionals, where the latter hold if the antecedent increases the probability of the consequent. Igor presented results from questionnaire and computer simulation studies.

Andr Fuhrmann (Frankfurt) described a solution to Fitch's knowability paradox based on a belief revision framework, which does not rely on the notion of transworld knowledge, i.e., knowledge about particular states of affairs in particular other possible worlds.

Franz Huber (Toronto) outlined his account of counterfactuals and stated the conditions under which these counterfactuals can be empirically tested. The testing works analogously to the testing of chance hypotheses by relative frequencies in a probabilistic setting, except that modes play the role of relative frequencies and counterfactuals play the role of objective chances.

Manfred Kupffer (Frankfurt) investigated how to formally account for property actualism, as described by Stalnaker and Forrest, in terms of a formal quantified modal logic and how to rid oneself thereby of merely possible individuals.

Hannes Leitgeb (LMU Munich) presented a conditional logic version of the Lottery paradox based on counterfactuals and chance and proposed a solution in terms of a context-dependeny of the space of propositions in Lewis sphere models.

Hans Rott (Regensburg) investigated the relationship between the plausibility approach of Friedman and Halpern and his own account and argued on that basis for his approach.

Gerhard Schurz (Duesseldorf) described joint work with Paul Thorn on a computer simulation study of formal systems, which govern inferences among conditional assertions that express high conditional probabilities. Their work evaluated Hawthorne's system **O**, Adams' system **P**, and Pearl's system **Z**.

Sonja Smets (Amsterdam) presented joint work with A. Baltag and V. Fiutek on a formal account of Keith Lehrer's concept of undefeated justified acceptance in terms of an approach, which combines elements from dynamic epistemic logic, justification logic, and belief revision.

Matthias Unterhuber (Duesseldorf) described a reconstruction of the Ramsey test (as in AGM belief revision and KGM update) in terms of a possible worlds semantics for conditionals that goes back to Chellas and Segerberg.

Heinrich Wansing (Bochum) inquired into the connexive reading of implication (based on Aristotle's thesis) and the negation of constructive implication and constructive co-implication in the context of bi-intuitionistic and dual intuitionistic logic.

The workshop was funded by the chair of theoretical philosophy at the university of Duesseldorf (Gerhard Schurz).

MATTHIAS UNTERHUBER
Philosophy, Duesseldorf

The Communication of Certainty and Uncertainty, 3–5 October

From the 3rd to the 5th October 2012 at the University of Macerata (Italy) was held the International Conference *"The Communication of Certainty and Uncertainty: Linguistic, Psychological, Philosophical Aspects"* organized by Andrzej Zuczkowski, Ramona Bongelli, Ilaria Riccioni, Carla Canestrari (University of Macerata), Sibilla Cantarini (University of Verona) and Anita Fetzer (University of Würzburg).

In addition to three invited speakers (Werner Abraham, University of Wien—Austria & Ludwig-Maximilians University of München—Germany), Elisabeth Leiss (Ludwig-Maximilians University of München—Germany), Jan Nuyts (University of Antwerp—Belgium), there were 134 speakers coming from all the 5 Continents (32 different Countries: Germany, Austria, Belgium, Sweden, Hungary, France, Romania, United Kingdom, Finland, Switzerland, Ukraine, Russian Federation, The Netherlands, Spain, Portugal, Norway, Italy, Canada, Colombia, Mexico, Brazil, South Africa, Tunisia, Lebanon, Turkey, USA, Japan, China, Morocco, Australia, Argentina, India) and divided in 23 Sessions (Religion, Specific Languages, Music, Media, Law, Multimodality, Communicative Interaction, Scientific Writing, Theory of Mind, Interaction at School, (Un)Certainty across Age, Decision making, Humour, Politics, Literature, Second Language and Contrastive Studies, Academic-Institutional Discourse, Doctor-Patient Interaction, Philosophy, Argumentation and Persuasion, and three Sessions specifically devoted to Italian, German and French Languages).

The scientific level of the Conference has been high; participants very much appreciated the organization, and the atmosphere among them was cooperative, friendly and as warm as the wonderful Italian sun along all the three days!

The book of abstracts is available to download from the Conference website.

ANDRZEJ ZUCZKOWSKI
ILARIA RICCIONI
RAMONA BONGELLI
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Research Centre for Psychology of Communication,
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Inferentialism in the Philosophy of Language, Mind and Action, 3–5 October

The 2012 workshop on Inferentialism in the Philosophy of Language, Mind and Action was the third Madrid Workshop on New Trends on the Philosophy of the Social Sciences, organized by UNED university. Inferentialism is an approach to rationality and intentionality, according to which the content of an intentional state is given by its inferential role in our reasoning and our discursive practices. The aim of the workshop was to discuss different aspects of inferentialist theories and their applications. There were 7 invited speakers and 14 contributed papers.

The first invited speaker, Sven Rosenkratz (Icrea / Universidad de Barcelona) raised some objections to the normative account of semantic entailment offered by Robert Brandom, and then discussed how this kind of account deals with hypothetical reasoning. Lilian Bermejo (Universidad de Granada) analysed inferential practices from the perspective of the theory of argumentation. She argued that conditionals in material inferences should be seen as playing the role of 'inferential steps'—rather than implicit premises. Daniel Whiting (University of Southampton) claimed that slurs express the same propositional content than their neutral counterparts, and that their derogatory component can be explained pragmatically—as associated conventional implicatures. María José Frápolli (Universidad de Granada) talked about the expressive role of the concept of truth. In general, the sentence "'p' is true' has the same content as the sentence 'p'. When we study truth looking at its expressive uses, most of the difficulties traditionally associated with this concept disappear.

Anthony Booth (University of Sussex) took into consideration the case of the suspension of judgement in order to enlighten the debate on belief and its aims. According to Booth, the impossibility of suspending our judgement at will should be explained as a psychological fact, rather than appealing to a constitutive aim or norm. Beatrice Sasha Kobow (University of Leipzig) proposed to find a common middle ground between Brandom's inferentialism and Searle's project in their accounts of the institution of social facts (paying special attention to the role of declarative speech acts). Lionel Shapiro (University of Connecticut) discussed how we can modify Brandom's account of assertive speech acts in order to explain our use of assertions in relativist discourses. In particular, in relativist speech, the asserter would only authorize a restricted audience to rely on the claim asserted—namely, the audience that shares the speaker's perspective at any subsequent time.

The contributed papers dealt with several issues related to inferentialism. Among other topics, there were proposals about formal developments in inferential semantics, on inferentialist accounts of communication, and about different applications of inferentialism to the philosophy of the social sciences (for instance, to the theory of public deliberation, to the study of collective intentionality, or to the analysis of causal explanation in social sciences). Also, it was argued that inferentialism may have difficulties for accounting for the meaning of certain concepts (in particular, some logical notions).

The workshop was sponsored by the research project "Inferentialism as social epistemology", funded by the Spanish government.

JAVIER GONZÁLEZ DE PRADO SALAS
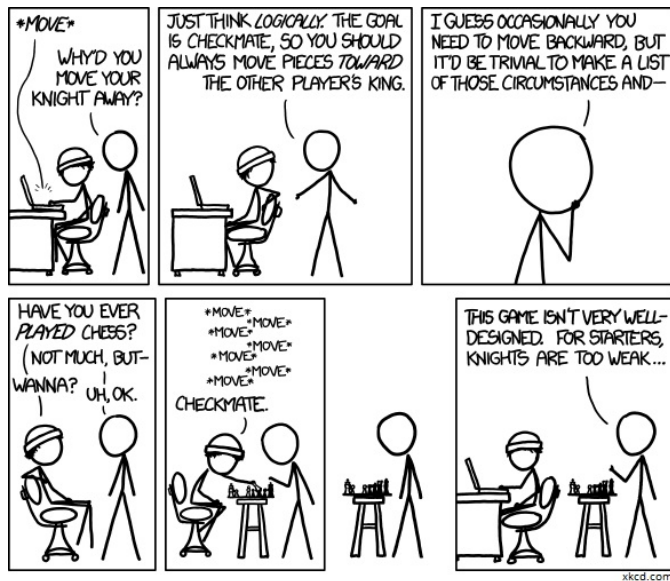Departamento de Lógica, Historia y Filosofía de la Ciencia,
UNED

Calls for Papers

EVIDENCE AND CAUSALITY IN THE SCIENCES: special issue of *Topoi*, deadline 1 November.

MACHINE LEARNING FOR SCIENCE AND SOCIETY: special issue of *Machine Learning*, deadline 16 November.

WHAT'S HOT IN . . .

Logic and Rational Interaction

Big honours for the field of logic and rational interaction: The nobel committee in Stockholm has awarded this year's Nobel Memorial Prize in Economic Sciences to Alvin E. Roth and Lloyd Shapley, for their work in mechanism design. This feels like a good moment to celebrate the work of Roth and Shapley.

Their work in mechanism design is a showcase example for the core idea of the study of social protocols: to create mechanisms that ensure optimal outcomes and at the same time are simple and robust enough to be implemented in an every day setting.

The work between the two prize winners has been split, with Lloyd Shapley, professor emeritus at the University and California, Los Angeles, laying the theoretical groundwork for the protocols in question. Most prominently, he worked on stable marriage problem. Assume to be given a group of men and women, each willing to get married. Naturally, every member of the group has their individual list of preferences on the members of the other sex. The task is then to make matches. Furthermore you would want to do so in a stable way, i.e., there should not be a man and a woman that are not yet matched with each other, but that could both improve by leaving their current partner and getting together. Shapley, together with David Gale, developed a surprisingly easy algorithm to solve this problem.

Besides that, further results of Shapley helped in estimating the impact of idealisations made in economic reasoning. For instance the famous Shapley-Folkman lemma gives estimates on how inadequate certain convexity assumptions usually made in economic reasoning are in finite situations. His research helps understand the gap between idealized lab situations and actual economic arrangements.

It was up to the second recipient of the prize, Alvin E. Roth (currently professor of Economics in Stanford), to imple-

ment modifications of the Gale-Shapley algorithm for practical matching problems. He helped to reform various matching systems such as the National Resident Matching Program that matches prospective doctors to hospitals. In addition to actually constructing these procedures, he also gave detailed analysis of the manipulability and optimality of the various algorithms involved.

Other procedures that Roth helped designing were the mechanisms for assigning school children to public schools in New York City and Boston.

These cases give a good illustration of how the original algorithm is adopted to make it applicable to actual settings. Obviously, it is impractical for all parties involved to submit *complete* preference lists, as initially needed by the algorithm. For the implementation, Roth, together with Abdulkadiroğlu and Pathak, required prospective school kids to only give their five preferred options. Schools on their sides do not submit any preference lists at all, but are involved in the computation by performing steps of the Gale-Shapley algorithm, which is thereby implemented in a distributed way.

The new algorithm improved the accuracy of school assigments by reducing the number of applicants not assigned any of their first five choices by 90%. Later works of Roth deal with the creation of a market for kidney donations.

Congratulations from the LORIweb community to the two laureates.

LORIweb is always happy to publish information on topics relevant to the area of Logic and Rational Interaction—including announcements about new publications and recent or upcoming events. Please submit such news items to Rasmus Rendsvig, our web manager or to the loriweb address.

DOMINIK KLEIN
TiLPS, Tilburg University

Uncertain Reasoning

From court cases to financial transactions, from personal health to parliamentary inquiries, complex decision-making often relies on expert opinion. But is it possible to define what it means to be an *expert*?

Reference to expert opinion is ubiquitous in the development of uncertain reasoning. Historians suggest that during the seventeenth and eighteenth century probabilists relied heavily on the "expectations of reasonable men" to formulate the first calculi of uncertainty—see Ch 2 of L. Daston (1988: *Classical Probability in the Enlightenment*, Princeton University Press). Bruno de Finetti—an undoubted champion of idiosyncrasy—described experts as those who are capable of expressing themselves in such a way as to prevent others to prove them wrong, no matter how things might turn out to be (B. de Finetti 2008: *Philosophical Lectures on Probability*, Springer). A rather dramatic instantiation of this form of expertise can be found in a popular story about how Girolamo Cardano—one of the founding fathers of the calculus of probability—predicted the day of his own death. As R. Epstein (2009: *The Theory of Gambling and Statistical Logic*, Elsevier) puts it "when the self-

predicted day of his own death arrived, with his health showing no signs of declining, he redeemed his reputation by committing suicide" (p.2). More common are ambiguous forecasts of the form 'rain at times in places' which are obviously impossible to falsify. One of de Finetti's arguments in favour of the probabilistic representation of uncertainty is precisely that it counters those minimally-committal forms of assessing and communicating uncertainty.

The recently published position paper by T. Krueger, T. Page, K. Hubacek, L. Smith, and K. Hiscock (2012: "The Role of Expert Opinion in Environmental Modelling", *Environmental Modelling and Software*, 36, pp. 418) discusses the central problem of how expert opinion enters complex decision-relevant modelling from a less idiosyncratic perspective than de Finetti's. The authors restrict the scope of their paper to environmental modelling, but the topics discussed are I think of great interest to the wider uncertain reasoning community.

The working definition of expertise is taken to be "centered on *experience*, under which experts are distinguished from non-experts by the relevance and extent or depth of their experience in relation to a topic of interest" (p.5). Taken at face value this may sound as an instance of de Finetti-style expertise, but it turns out that in the specific context of environmental modelling this is far from being the case. The paper makes a very interesting case for the importance of the input provided by non-scientific experts in the construction of environmental models. So, "farmers and land managers [...] hold knowledge and experience grounded in everyday land management practices that is only partly accessible through scientific observation" (p 6).

One particularly interesting consequence of this concerns the role of experts (in the above sense) as "stakeholders", a concept with a distinctive double connotation. Stakeholders are those who are either affected by the outcomes of the model or can affect the model by providing expert input. The paper reviews a number of case-studies supporting the claim that "in practice a separation of experts and stakeholders is both unrealistic and counter-productive in that it would prevent the social capital resulting from co-generation of knowledge in a stakeholder group" (p. 8).

This point of view leads naturally to consider the role of *subjective* expert opinion in environmental modelling. The central part of this position paper is in fact devoted to analysing the many ways in which both implicit and explicitly-elicited subjective expertise enter the current practice of environmental modelling. This seemingly 'technological' problem resonates abundantly with the logical problems of merging qualitatively distinct pieces of evidence and aggregating a plurality of expert opinions into a coherent, decision-relevant collective assessment.

Finally, uncertain reasoners who are curious to see how probabilistic networks, fuzzy logic and Bayesian statistical methods are applied in environmental modelling will find in Krueger et al (2012) an extensive list of references.

HYKEL HOSNI
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CPNSS, LSE

INTRODUCING . . .

Inductive Logic

What might be called *classical inductive logic* was developed alongside classical propositional deductive logic, by Wittgenstein when he put forward his truth table method in the *Tractatus*.

Consider, for example, the following argument:

$$(a \wedge b) \to c$$
$$\frac{a}{c}$$

We can ask whether the premises deductively entail the conclusion, $(a \wedge b) \to c, a \models c$. To see that they do not, we build a truth table:

a	b	c	$(a \wedge b) \to c$	a	c
T	T	T	T	T	T
T	T	F	F	T	F
T	F	T	T	T	T
T	F	F	T	T	F
F	T	T	T	F	T
F	T	F	T	F	F
F	F	T	T	F	T
F	F	F	T	F	F

The fourth line of the truth table shows that the argument is deductively invalid: there is a truth assignment to the atomic propositions a, b, c that makes the premises true and the conclusion false.

Wittgenstein's suggestion is that we measure the *degree* to which the premises entail the conclusion by the proportion of those truth assignments which make the premises true that also make the conclusion true (1922: Tractatus logico-philosophicus, §5.15). Since two out of the three truth assignments which make the premises true also make the conclusion true, the degree of partial entailment is 2/3 and we can write $(a \wedge b) \to c, a \approx c^{2/3}$. This is the core idea behind classical inductive logic, and is very much in line with what is known as the classical interpretation of probability, articulated by Laplace (1814: A philosophical essay on probabilities).

Carnap noted that classical inductive logic struggles to capture the phenomenon of learning from experience. This is due to the fact that logically independent propositions are also rendered probabilistically independent by classical inductive logic. Let b_i denote the proposition that the i'th observed raven is black. Classical inductive logic yields that $\approx b_{101}^{1/2}$, which seems reasonable enough, but also that $b_1, \ldots, b_{100} \approx b_{101}^{1/2}$. So, observing 100 black ravens fails to raise the probability that the 101st raven is black above $\frac{1}{2}$.

It was felt in the middle of the 20th Century that while classical inductive logic fails to provide an adequate account of partial entailment in the case of logically independent propositions (i.e., fails to capture *inductive entailment*), it succeeds in capturing the correct notion of partial entailment in the case of logically overlapping propositions (*logical entailment*). This led to a dilemma: while Kemeny and Oppenheim (1952: Degree of factual support) focused on developing classical inductive logic to analyse logical entailment at the expense of inductive entailment, Carnap (1952: The continuum of inductive methods, Chicago) gave up on classical inductive logic,

isolating a range of inductive logics that better capture inductive entailment. Others (e.g., Salmon 1967: Carnap's inductive logic, §1), despaired that the programme of developing inductive logic was untenable because there appeared to be no single system that captures both kinds of partial entailment.

Since then, the Manchester school of inductive logic has continued the Carnapian programme of isolating principles that can be used to characterise inductive logics which capture learning from experience (Paris & Vencovská 2013: Pure inductive logic, CUP). Interestingly, it turns out that a consideration of inductive logic on polyadic predicate languages leads to powerful new principles such as *Spectrum Exchangeability*, a symmetry principle in the same spirit as de Finetti's original exchangeability principle which says that in the absence of any premises, the probability of a sentence ψ should remain the same when the contant symbols that appear in it are exchanged.

In contrast, the approach here at Canterbury is to appeal to Bayesian epistemology to provide semantics for inductive logic. Under this approach, $\varphi_1^{X_1}, \ldots, \varphi_k^{X_k} \approx \psi^Y$ is interpreted as saying that if one grants just that the chance of φ_i is in subset X_i of the unit interval, for $i = 1, \ldots, k$, then one ought to believe ψ to some degree within Y. Objective Bayesian epistemology imposes three norms on strength of belief:

PROBABILITY. Degrees of belief should satisfy the axioms of probability. So the probability calculus helps to determine Y.

CALIBRATION. Degrees of belief should be calibrated with available chances. In particular, if the premises $\varphi_1^{X_1}, \ldots, \varphi_k^{X_k}$ are consistent then one should believe each φ_i to some degree within the set of probabilities spanned by X_i.

EQUIVOCATION. One's degrees of belief should otherwise equivocate sufficiently between the basic propositions that one can express. Thus one should not believe ψ more strongly than is forced by the premises.

It turns out that the Calibration norm enables the resulting inductive logic to capture learning from experience: frequentist confidence-interval methods can be used to derive constraints on the chance of the next raven being black, given a sample of past ravens, and by the Calibration norm, one's degree of belief should be calibrated with such information. On the other hand, the Equivocation norm ensures that the resulting inductive logic preserves classical inductive logic in the case in which propositions are logically independent. Thus it appears that Salmon's fears were unfounded and that a single system of inductive logic can capture both inductive and logical entailment.

In a new AHRC project, Teddy Groves, Jürgen Landes and I are developing this account of inductive logic and are examining the extent to which it overcomes a range of philosophical criticisms directed at the Carnapian approach. We very much welcome visitors and others keen to engage with this research programme.

Of course there are more ways in which one might provide semantics for inductive logic than I have been able to mention here (see., e.g., Haenni et al. 2011: Probabilistic logics and probabilistic networks). One can get a glimpse of the variety of work in this field at the Workshops on Combining Probability and Logic. The next workshop is set to take place in Munich on 17–18 September 2013, and the following workshop on 20–22

April 2015 in Canterbury.

JON WILLIAMSON
Philosophy, Kent

Counterfactual Causality in Population Sciences

Many population scientists, especially in America, use the counterfactual theory to show the existence of a causal relationship that would allow their findings to contribute to effective policy-making.

An initial article by Kuhn et al. ((2011) 'The effects of children's migration on elderly kin's health: A counterfactual approach,' *Demography*, 48 (1), pp. 183–209) concerns the effect of children's internal migration on their parents' health. The article uses a pseudo-randomization in which a sample is created by using a set of characteristics (here: age, sex, and the number of children aged 15 and over) so that each migrant is matched with another non-migrant person in the counterfactual control group. Kuhn shows a positive effect of the children's migration on the health of non-migrant parents.

A second article by Torche (2011: The effect of maternal stress on birth outcomes: exploiting a natural experiment, *Demography*, 48 (4),1473–1491) seeks to assess the impact of a high-magnitude earthquake that struck northern Chile in 2005 on the weight at birth of children born after the event. Arguably, an earthquake may be regarded as independent of the other characteristics influencing the births of the persons affected by the event. To that extent, we may consider that the randomization condition is met. Torche finds an average decrease of 51 grams in the weight of children born to women in the quake-struck areas relative to the figure in unaffected areas.

Smith's comments on this approach in 1990 give reason to question these findings. Regarding the first example, and many other cases, he observes:

> How does the investigator know when the proper specifying variables have been incorporated into the experimental design? As with the specification of models for the analysis of data obtained from observational studies, theory is the ultimate guide. (Smith H.L., 1990, Specification problems in experimental and nonexperimental social research, *Sociological Methodology* 20, 59–91)

The characteristics included in this example are not necessarily those that should be tracked, for the phenomenon studied has not been sufficiently theorized. For the second example, Smith cites a condition that Holland (1986: Statistics and causal inference, *Journal of the American Statistical Association* 81, 945–960) described as essential: *there is no causality without manipulation*. If so, it is hard to imagine what actions could avert earthquake-related risks. More generally, many of the characteristics incorporated into these types of model make the manipulation criterion impossible to apply:

> The manipulability criterion for causal inference has been difficult to assimilate in a discipline that routinely reports measurements of the *causal* effects of sex, race, and age, *inter alia*, on various phenomena. (Smith 1997, Matching with multiple controls to estimate treatments effects in observational studies, in *Sociological Methodology 1997*, Raftery, A.E. ed., Oxford: Basil Blackwell, 325–353)

It is better to avoid including these characteristics in analytical studies. In an event-history analysis of international migrations in 1985, I showed that the age effect—which many demographers are so fond of—vanishes entirely when we incorporate characteristics of the individual amenable to policy action (Courgeau D. 1985, Interaction between spatial mobility, family and career life-cycle: A French survey, *European Sociological Review*, 1(2),139–162.). These characteristics concern education, family life, politics including war, economics including unemployment, and so on. We can thus cover the aspects of our society that may affect people's lives and are open to policy actions, even if these are hard to implement.

However, I believe Smith went too far when he stated in 2003:

> We measure at the micro level, but we intervene—manipulate—at some higher level. (Smith H.L. (2003), Some thoughts on causation as it relates to demography and population studies, *Population and Development Review*, 29 (3), 459–469).

He concluded that analyses at the individual level were of little value for action purposes.

The example of my 2003 analysis of the migration of Norwegian farmers shows why Smith's conclusion is wrong (Courgeau D. (2003), From the macro-micro opposition to multilevel analysis in demography, in *Methodology and epistemology of multilevel analysis. Approaches from different social sciences*, Courgeau D. (eds), Dordrecht: Kluwer Academic Publishers, 43–92). Working at the macro level of regions and performing a standard regression analysis, we find that the probability of migrating rises with the percentage of farmers in the local population, taking all other available characteristics into account. We could interpret the finding, in the manner of Durkheim (1895: *Les règles de la méthode sociologique* Paris: Alcan), as a sign that farmers are more likely to migrate. But a *micro* analysis shows the exact opposite: farmers are less likely to migrate than other occupational categories. In fact, the only way to reconcile these apparently contradictory results is to conduct a *multilevel* analysis. If farmers are less likely to migrate regardless of their percentage in the local population, it is non-farmers who will be more likely to migrate when their region comprises a higher proportion of farmers.

Thus, if we went to influence farmer mobility, the *macro* analysis would incite us to increase migration bonuses, or any other benefit, for farmers living in areas where they represent a small share of the population. But *multilevel* analysis shows that such a measure would be ineffective, since the farmers' probability of migrating is the same regardless of the region where they live. By observing different levels, therefore, we can fully understand why the *macro* analysis misled us into making a wrong policy decision.

Beyond this example, we can see that multilevel analysis is complementary to *macro* level analysis by introducing effects at different aggregation levels, and it gives us a deeper understanding of social phenomena.

DANIEL COURGEAU
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EVENTS

NOVEMBER

MAGG: AAAI Fall Symposium on Machine Aggregation of Human Judgment, Arlington, VA, USA, 2–4 November.

ACML: 4th Asian Conference on Machine Learning, Singapore, 4–6 November.

BOTB: Bayes on the Beach, Queensland, Australia, 6–8 November.

STRUCTURE@50: Assessing and Reassessing Kuhn and his Legacy, Princeton, 9–10 November.

CULTURES OF MATHEMATICS AND LOGIC: Guangzhou, China, 9–12 November.

URSW: Uncertainty Reasoning for the Semantic Web, Boston, USA, 11–12 November.

ARCHÉ/CSMN: Graduate Conference, University of Oslo, Norway, 17–18 November.

SILFS: Italian Society of Logic and Philosophy of Science Conference, University of Milan-Bicocca, 20–21 November.

MODAL LOGIC IN THE MIDDLE AGES: University of St Andrews, 22–23 November.

CSE: Intuition and Experimental Epistemology, University of Sherbrooke, Quebec, 23–24 November.

COGSC: ILCLI International Workshop on Cognitive Science, Donostia, San Sebastian, 28–30 November.

RENÉ DESCARTES LECTURES: Tilburg Center for Logic and Philosophy of Science, 28–30 November.

ABNMS: 4th Annual Conference of the Australasian Bayesian Network Modelling Society, University of Wollongong, 28–30 November.

INTENTIONS: Philosophical and Empirical Issues, Rome, Italy, 29–30 November.

LEMMING: Graduate Conference, Cologne, Germany, 29 November–1 December.

WEIGHING REASONS: Princeton University, 30 November–1 December.

December

The Analysis of Theoretical Terms: Munich, Germany, 1 December.

LENLS 9: Logic and Engineering of Natural Language Semantics, Miyazaki, Japan, 1–3 December.

NIPS: Neural Information Processing Systems Conference and Workshops, Nevada, USA, 3–8 December.

MM2012: Models and Mechanisms, TiLPS, Tilburg, Netherlands, 6–7 December.

K-NMTD: Konstanz-Naples Model Theory Days, University of Konstanz, Germany, 6–8 December.

CPH-LU: 5th Copenhagen Lund Workshop on Social Epistemology, Lund University, 7 December.

Bayesian Optimization and Decision Making: Nevada, USA, 7 December.

MLINI: 2nd Workshop on Machine Learning and Interpretation in NeuroImaging, Nevada, USA, 7–8 December.

Risk and Acceptability: University of Zurich, 7–8 December.

Probabilistic Programming: Foundations and Application, Nevada, USA, 7–8 December.

25 Years in Contradiction: University of Glasgow, 7–9 December.

Probabilistic Numerics: Nevada, USA, 8 December.

AGI12: 5th Artificial General Intelligence Conference, University of Oxford, 8–11 December.

AGI-Impacts: 1st Conference on Impacts and Risks of Artificial General Intelligence, University of Oxford, 10–11 December.

ICMLA: 11th International Conference on Machine Learning and Applications, Florida, USA, 12–15 December.

EGaCRiS: Conference on Epistemic Groups and Collaborative Research in Science, Nancy, France, 17–19 December.

International Triennial Calcutta Symposium on Probability and Statistics: Kolkata, West Bengal, India, 27–30 December.

January

SODA: ACM-SIAM Symposium on Discrete Algorithms, New Orleans, Louisiana USA, 6–8 January.

LFCS: Symposium on Logical Foundations of Computer Science, San Diego, California, USA, 6–8 January.

TARK: 14th Conference on Theoretical Aspects of Rationality and Knowledge, Chennai, India, 7–9 January.

ICLA: 5th Indian Conference on Logic and its Applications, Chennai, India, 10–12 January.

CGCotPoM&L: 6th Annual Cambridge Graduate Conference on the Philosophy of Mathematics and Logic, Cambridge University, 19–20 January.

February

ICIIN: 2nd International Conference on Intelligent Information Networks, Maldives, 2–3 February.

SPIM: Workshop on Semantic Personalized Information Management, Rome, Italy, 4 February.

LAFLang: 2nd International Workshop on Learning, Agents and Formal Languages, Barcelona, Spain, 15–18 February.

ICAART: 5th International Conference on Agents and Artificial Intelligence, Barcelona, Spain, 15–18 February.

COURSES AND PROGRAMMES

APhil: MA/PhD in Analytic Philosophy, University of Barcelona.

Doctoral Programme in Philosophy: Language, Mind and Practice, Department of Philosophy, University of Zurich, Switzerland.

HPSM: MA in the History and Philosophy of Science and Medicine, Durham University.

Master Programme: in Statistics, University College Dublin.

LoPhiSC: Master in Logic, Philosophy of Science & Epistemology, Pantheon-Sorbonne University (Paris 1) and Paris-Sorbonne University (Paris 4).

Master Programme: in Artificial Intelligence, Radboud University Nijmegen, the Netherlands.

Master Programme: Philosophy and Economics, Institute of Philosophy, University of Bayreuth.

Master Programme: Philosophy of Science, Technology and Society, Enschede, the Netherlands.

MA in Cognitive Science: School of Politics, International Studies and Philosophy, Queen's University Belfast.

MA in Logic and the Philosophy of Mathematics: Department of Philosophy, University of Bristol.

MA in Logic and Philosophy of Science: Faculty of Philosophy, Philosophy of Science and Study of Religion, LMU Munich.

MA in Logic and Theory of Science: Department of Logic of the Eotvos Lorand University, Budapest, Hungary.

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

MA in Mind, Brain and Learning: Westminster Institute of Education, Oxford Brookes University.

MA in Philosophy: by research, Tilburg University.

MA in Philosophy of Biological and Cognitive Sciences: Department of Philosophy, University of Bristol.

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

MA programmes: in Philosophy of Language and Linguistics, and Philosophy of Mind and Psychology, University of Birmingham.

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

MRes in Methods and Practices of Philosophical Research: Northern Institute of Philosophy, University of Aberdeen.

MSc in Applied Statistics: Department of Economics, Mathematics and Statistics, Birkbeck, University of London.

MSc in Applied Statistics and Datamining: School of Mathematics and Statistics, University of St Andrews.

MSc in Artificial Intelligence: Faculty of Engineering, University of Leeds.

MA in Reasoning

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

MSc in Cognitive & Decision Sciences: Psychology, University College London.

MSc in Cognitive Science: University of Osnabrück, Germany.

MSc in Cognitive Psychology/Neuropsychology: School of Psychology, University of Kent.

MSc in Logic: Institute for Logic, Language and Computation, University of Amsterdam.

MSc in Mathematical Logic and the Theory of Computation: Mathematics, University of Manchester.

MSc in Mind, Language & Embodied Cognition: School of Philosophy, Psychology and Language Sciences, University of Edinburgh.

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

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

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

PhD School: in Statistics, Padua University.

Jobs and Studentships

Jobs

Post-doc Position: on Data Analysis for Knowledge Discovery and Decision Making, Department of Electrical, Computer, and Systems Engineering at Rensselaer Polytechnic Institute (RPI), Troy, NY, until filled.

Associate Professor or Professor: in Logic and the Philosophy of Science, University of Calgary, until filled.

Post-doc Position: in Probabilistic Reasoning, Vienna University of Technology, Austria, until filled.

Post-doc Position: in Cognitive Psychology and/or Computational Modelling at the Center of Experimental Psychology and Cognitive Science, Justus Liebig University Giessen, until filled.

Assistant Professor: in Cognitive Psychology, Center of Experimental Psychology and Cognitive Science, Justus Liebig University Giessen, until filled.

Post-doc Position: in Graphical Models / Structural Learning, Uncertainty Reasoning Laboratory, Queens College / City University of New York, until filled.

Post-doc Position: in Artificial Intelligence / Biomedical Informatics, Stevens Institute of Technology, until filled.

Assistant Professor: AOS: Logic, Stanford University, deadline 1 November.

Post-doc Position: in Formal epistemology, Logic, or Rational Choice, Department of Philosophy at Carnegie Mellon, Pittsburgh, deadline 1 November.

Assitsant Professor: in Machine Learning, University of Amsterdam, deadline 2 November.

Post-doc Position: in Machine Learning, University of Amsterdam, deadline 2 November.

Assistant Professor: AOS: Philosophical or Mathematical Logic or Philosophy of Mathematics, Kansas State University, Manhattan, Kansas, USA , deadline 2 November.

Post-doc Positions: in Statistics, University of Warwick, deadline 14 November.

Professor: in Statistics, University of Warwick, deadline 14 November.

Associate Professor: in Probability, School of Mathematical Sciences, University of Nottingham, deadline 14 November.

Post-doc Positions: on project Epistemic Utility Theory: Foundations and Applications, Department of Philosophy, University of Bristol, deadline 24 November.

Post-doc Position: to contribute to the AHRC funded research project Managing Severe Uncertainty, The Centre for Philosophy of Natural and Social Science, LSE, deadline 1 December.

Studentships

PhD Position: on Data Analysis for Knowledge Discovery and Decision Making, Department of Electrical, Computer, and Systems Engineering at Rensselaer Polytechnic Institute (RPI), Troy, NY, until filled.

PhD Positions: in the Statistics & Probability group, Durham University, until filled.

PhD Position: in Machine Learning, University of Amsterdam, deadline 2 November.

PhD Position: in Logical and Computational Models of Moral Reasoning, TiLPS, deadline 15 November.

PhD Positions: in Theoretical and Computational Neuroscience and Machine Learning, Gatsby Computational Neuroscience Unit, University College London, deadline 16 December.

PhD Position: on the project "Knowledge Representation and Inference Based on Type-2 Fuzzy Sets and Systems," School of Computer Science, University of Nottingham, deadline 30 December.

Two PhD Positions: for research project on "Managing Severe Uncertainty," Department of Philosophy, Logic and Scientific Method at the London School of Economics and Political Science, deadline 11 January.