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Probability in the Philosophy of Religion

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The past few years have witnessed a remarkable resurgence of interest in the intersection of formal methodology and epistemological theory, manifested in the organization of various conferences and the publication of numerous edited volumes. It is our opinion that this trend is likely to have a profound and positive impact on philosophical research, and will do so beyond the confines of epistemology proper, as recent developments in formal epistemology are brought to bear on relevant debates in further philosophical sub-disciplines.

Of course, it must be conceded that the ‘formalization’ of any area of philosophical inquiry does have its potential pitfalls. Most obviously, the technicality of an exposition risks obscuring both shoddy philosophical reflection and dubious empirical assumptions, casting a veneer of false precision and scientific respectability. But the merits are legion, ranging from a welcome disambiguation of everyday discourse, to the enabling of a fast and reliable calculation of the sometimes surprising consequences of a set of apparently anodyne philosophical commitments.

Of the numerous formal approaches to the philosophy of rational belief, it is the probabilistic framework that has arguably proven to be the most fruitful to date and remains the dominant approach in contemporary philosophy of science and epistemology.¹ In particular, a body of research carried out under the heading of ‘Bayesian confirmation theory’ has, over the past fifty years or so, applied the tools of probability theory to deliver some extremely promising insights into the nature and logic of evidential support.²

¹ For overviews of the philosophical literature on the nature of probability, see A. Hájek, B. Fitelson, and N. Hall (2005), A. Hájek (2010), or P. Humphreys (1998) for succinct expositions; for book-length presentations, see D. Gillies (2000) or D. Mellor (2005). A. Eagle’s recent anthology contains many of the essential articles on the subject (Eagle 2010).

² Probabilistic analyses of various evidential concepts find their roots in R. Carnap (1962). See F. Huber (2007) for a brief recent summary of the achievements and shortcomings of this enterprise. J. Earman (1992) provides a more in-depth and sympathetic coverage of the same territory.

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As probabilistic epistemology continues to blossom into a mature and increasingly sophisticated research programme, it is worth remembering that the philosophy of religion has long proven to be an extremely fertile ground for the application of probabilistic thinking to traditional epistemological debates.

Philosophy of religion, as a modern academic discipline, traces its pedigree through ancient and medieval debates about the existence and nature of God. However, the discipline, as we know it today, finds its formative moment in the work of early modern European philosophers such as David Hume (1711–76). Hume’s influence on this area of philosophy has been so pervasive that even today many key debates still take place within the terms he established. And indeed, a number of the essays in this volume can be readily identified as falling within the long tradition of responses to Hume’s formulations of certain key problems faced by theism.³ This is especially so of the essays by Benjamin Jantzen, Tim and Lydia McGrew, and Luc Bovens in Part I of this volume on ‘Testimony and Miracles’. But Hume also had a profound influence on the approach taken by many modern philosophers of religion to issues concerning cosmology and arguments from design, the subject of the essays by David Glass and Richard Swinburne in Part II. In addition, he set the terms of the modern debate on the problem of evil—the focus of the essays by Michael Tooley and Richard Otte in Part III.

In Hume’s day, and indeed until the mid-twentieth century, philosophy of religion was not generally regarded as a distinct area of philosophy clearly distinguishable from other areas. Instead it was practised as part of a unified philosophical reflection that also encompassed areas of general popular interest, such as ethics and politics, as well as more abstract areas like metaphysics (see Harrison, forthcoming). It is frequently overlooked today that all of the seminal figures who shaped the modern Western philosophical tradition were seriously engaged with questions that are now regarded as the unique preserve of philosophy of religion (see Taliaferro 2005). Despite the fact that by the mid-twentieth century philosophy of religion, along with most of the other sub-branches of philosophy now familiar to us, had become sharply demarcated as a distinct area of philosophical inquiry, the issues addressed within it remained not too far removed from the more general concerns of ‘ordinary’ reflective people. In fact, in an age of increasing popular scepticism about theistic belief, the preoccupation of philosophers of religion with arguments for and against the existence of God echoed the concerns of the non-philosophical but reflective public.

Philosophy of religion has never been completely detached from the spirit and concerns of the age in which it is practised. This was as true in Hume’s day as it is in our own. The chapters in this volume are part of a long tradition of philosophical reflection on matters of religious concern. But they are also examples of that form of analytic philosophy of religion which began to emerge from the intellectual culture

³ See David Hume, *Dialogues Concerning Natural Religion* (1779).

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of the late 1960s, after the thawing of the freeze on the discipline effected by the dominance of logical positivism during the 1950s (see Harrison 2007).

What emerged in the response to the challenges, such as that presented by the methodology of logical positivism, confronting philosophy of religion in the mid-twentieth century was a newly invigorated discipline which—although it remained by and large focused on traditional themes—was imbued with a new confidence and characterized by a greater rigour than had been evident prior to this time. Part of what contributed to this amplification of concern with analytical rigour was the concentration on linguistic analysis that had crystallized as philosophers of religions sought to recover the integrity of their discipline in the aftermath of positivism. The focus of philosophers of religion on linguistic analysis during this period is well-documented and it mirrored the situation in other areas of philosophy.⁴ However, less well documented and, perhaps, less well appreciated is the key contribution made to the discipline by the intensification of the cross-fertilization of probability theory and philosophy of religion which occurred at this time. Probability theory came to play a central role in the work of many philosophers of religion and, arguably, it was even more influential than linguistic analysis in driving philosophy of religion in the direction of increased analytic rigour.

Ironically, one reason that the formative role that the notion of probability has exercised on the philosophy of religion in recent times is often overlooked may be that it has enjoyed such a ubiquitous structuring effect on the content and methodology of the discipline that its very ubiquity has hidden it from notice.⁵ In the same way that fish rarely notice the water they swim in, philosophers of religion have imbibed notions of probability, and kindred notions of evidence and rational belief, and allowed these to structure their approach to the discipline.

The *rapprochement* between probability theory and philosophy of religion which occurred in the 1970s set the course for the evolution of the latter for the decades to come. The publication of Richard Swinburne's *The Existence of God* in 1979 was pivotal to this evolution as it helped to establish probability theory as the dominant mode of discourse within philosophy of religion. The publication of Swinburne's book heralded a decisive shift in Anglo-American philosophy of religion. This was so both in terms of the analytic rigour henceforth demanded in the field and in the topics that philosophers of religion increasingly came to focus their attention upon. From this point, linguistic analysis dropped out of focus as the dominating concern of the discipline; instead interest converged on precisely those areas of the subject which are most amenable to probabilistic analysis. To give just one example, prior to this

⁴ See, for example, various essays in vol. 5 of G. Oppy and N. Trakakis' recent monumental anthology covering the history of philosophy of religion from antiquity to the present day (Oppy and Trakakis 2009). See also B. Mitchell's well-known collection of essays from the post-positivist period (Mitchell 1971). For a discussion, see V. S. Harrison (2007, ch. 4).

⁵ Although there have been some attempts to bring the role of probability theory in philosophy of religion and theology more clearly into view. See D. J. Bartholomew (1988) and Watts (2008).

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development the logical problem of evil (as formulated by John Mackie in 1955) was an overriding focus of attention within the discipline; after, however, there was a dramatic loss of interest in this problem as attention shifted to the evidential problem of evil (see Rowe 1979 and 1991). The debate about this latter problem is carried forward in the present volume by the contributions of Michael Tooley and Richard Otte. The change that took place when philosophers of religion shifted attention from the logical to the evidential problem of evil is symptomatic of a more general shift that took place from concern with the notion of proof to a focus on the rationality of belief construed in probabilistic terms.

As the notion of probability became more thoroughly assimilated into philosophy of religion, not only was there a shift of attention toward the evidential problem of evil but there was also renewed interest in other areas of the discipline that invited analysis in inductive terms. One such was the topic of ‘Testimony and Miracles’, already discussed by Hume in the eighteenth century. Richard Swinburne was again ahead of the trend in this respect when his book *The Concept of Miracle* was published in 1971.

The wealth of research that began to appear in the 1980s on religious epistemology also points to the increasing centrality, within philosophy of religion, of the notion of evidence and the related notion of what it is reasonable to believe.⁶ The movement known as Reformed Epistemology, which has been especially prominent among North American theistic philosophers, forms part of this trend.⁷ The increasing importance of notions of evidence and explanation can also be identified in the renewed concern with the design argument for the existence of God (see Part II of this volume). However, the fecundity of the recent pairing of philosophy of religion and probability theory has far outstripped the usual debates about evidence and explanation. It has also generated a resurgence of interest in topics such as Pascal’s wager (see the contributions of Alan Hájek and Paul Bartha to this volume), which is widely regarded as a landmark in the formal understanding of probability as well as decision theory (see Hacking 1975).

The influence of this change of focus away from concern with proof and certainty and towards notions of evidence, rational belief, explanation, and, underlying all of these, probability, was so pervasive that in retrospect one might come away with the impression that the trajectory taken by the discipline over the course of the last few decades could have been predicted. Despite this, the recent history of philosophy of religion seen through the lens of the evolution of probability theory is yet to be written, and it is not the purpose of the current volume to fill this lacunae. Nor does the current volume intend to review the trajectory that, under the impetus

⁶ For a representative collection of essays on religious epistemology from this period, and some critical discussion of them, see R. D. and B. Geivett and Sweetman (1992).

⁷ Notable within this movement are W. P. Alston (see Alston 1991), N. Wolterstorff (see Wolterstorff 1983), and A. Plantinga. The latter has contributed an important trilogy to the literature (see Plantinga 1993a, 1993b, and 2000).

of developments in our thinking about probability, philosophy of religion has taken over the past few decades. Rather it showcases some of the latest work—by both established and new scholars—on key topics in philosophy of religion that reflect the central strategic importance that probability theory has had, and continues to enjoy, on this area of philosophy. The essays contained in this volume demonstrate how far philosophy of religion has come in reaping the benefits of applying probability theory to its traditional domain; they are also suggestive of areas in which there remains much scope for a deeper and yet more rigorous application of the tools of probability and decision theory.

In the following sections we briefly review each of the topics with which this volume is concerned. These topics have been chosen because they are all key areas of philosophy of religion to which the contribution of probability theory has been pronounced. We also provide short summaries of each chapter, situating them in the context of the wider debates to which they contribute. We conclude this chapter with some brief comments regarding the future direction in which such studies might lead. We now turn to our first topic.

Part I. Testimony and Miracles

Reports of the occurrence of ‘miraculous’ events, such as spontaneous healings, transmutations of substances, and even resurrections, occupy a prominent place in the battery of considerations that are typically adduced in favour of theism. Whilst there is a long tradition of philosophical commentary on such appeals to testimony, as indicated above, it is fair to say that the bulk of the contemporary discussion of the matter has been written in connection with Hume’s eighteenth-century essay ‘Of Miracles’, which appears as Section X of his *Enquiries Concerning Human Understanding*.

Here, Hume offers a number of considerations aiming to demonstrate that ‘that no human testimony can have such force as to prove a miracle, and make it a just foundation for any system of religion’ (Hume 1748/77, Section X, Part II, §22). The centrepiece of the discussion is the following famous maxim, drawn from Part I of the essay, in which Hume outlines the way in which he believes the evidential impact of reports of the occurrence of a miraculous event ought to be assessed:

no testimony is sufficient to establish a miracle, unless the testimony be of such a kind, that its falsehood would be more miraculous, than the fact, which it endeavours to establish: And even in that case, there is a mutual destruction of arguments, and the superior only gives us an assurance suitable to that degree of force, which remains, after deducting the inferior. (Hume 1975: 115–16)

In Part II of the essay, Hume moves on to adduce various factual considerations aiming to undermine the degree to which one might consider the falsity of the testimony to be miraculous. In view of the strength of prior evidence against the

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occurrence of any given miracle, the upshot is then, according to Hume, that testimony to the miraculous ought to be ultimately discounted.

Although Hume's maxim is not couched in probabilistic terms, the quantitative talk of the degree to which an event is miraculous, or again of the degree of strength of an argument, certainly invites a translation into a contemporary probabilistic framework. And indeed, much of the post-Humean literature on the epistemology of testimony to the miraculous has been framed in these terms.

In recent years, from the mid-eighties onward, the focus of the discussion has been largely exegetical, with the emergence of a lively debate among philosophers of science regarding the proper probabilistic interpretation and evaluation of Hume's comments.⁸ The contributions to the present volume, however, largely steer clear of interpretational issues surrounding 'Of Miracles', focusing instead on a number of general questions raised by probabilistic approaches to the problem of miracles.⁹

In his 'Peirce on Miracles: The Failure of Bayesian Analysis', Benjamin Jantzen draws upon three manuscripts of Charles Sanders Peirce to offer a sympathetic overview of the latter's criticisms of the application of probabilistic reasoning in the assessment of the impact of testimony to the occurrence of miracles.

The method under criticism, the Method of Balancing Likelihoods (MBL), which Peirce attributes to Hume, involves a computation of the odds of the occurrence of a miracle, conditional on the claims of n witnesses testifying to its occurrence. In the particular case in which the testimonies satisfy a certain strong independence condition, this can be computed from just the prior probability of the occurrence M of the miracle and the individual probabilities of the various witnesses testifying positively on the respective assumptions of M and not- M .

Jantzen finds in Peirce a range of concerns regarding the applicability of MBL. These range from the apparent denial, on the basis of seemingly frequentist considerations, of the possibility of assigning, even in principle, the requisite kinds of conditional probabilities, to the claim that MBL is an empirical failure.

The core complaint, however, is that a sampling bias inherent in the collection of witness reports on miracles renders the updating of one's odds for M by means of MBL a fruitless enterprise. Indeed, for obvious sociological and psychological reasons, one is far more likely to find oneself in the possession of testimonies in favour of M than

⁸ See P. Millican (MS) for a catalogue of recent proposals. Among the suggestions discussed are those of J. Earman (1993), D. Gillies (1991), R. D. Holder (1998), P. Millican (1993), and J. H. Sobel (1991). J. Earman (2000) provides an important, if somewhat controversial, book-length critique of Hume from a probabilistic perspective.

⁹ For general overviews of the literature on miracles, see D. Corner (2005), M. Levine (2010), T. McGrew (2010), and J. H. Sobel (2004, ch. 8). These notably address the vexed issue of what exactly does and does not qualify as a miracle. This is an issue that is bracketed by the contributors to the present volume, who rely on an intuitive understanding of the term, as used in the religious context, which uncontroversially applies to the kinds of examples that we gave in the opening paragraph of this section.

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one is of testimonies in favour of its negation. And of course, as Jantzen illustrates with a number of examples, this bias in the data can have a dramatic impact on the resulting assessment of odds. As a corrective, Peirce suggests a two-way division of inquiry. First, an abductive stage leads to the formulation of various hypotheses, put forward on the basis of their providing good explanations of the available data. This data is then to be discounted in the second, inductive, phase of the process, during which the collection of a bias-free sample underpins an assessment of the relative merits of the hypotheses under consideration.

The point of departure for Tim and Lydia McGrew's 'The Reliability of Witnesses and Testimony to the Miraculous' is a well-known formula, offered by Condorcet (1783), for updating one's degree of confidence in the occurrence of a miracle upon learning of the positive testimony of an alleged witness to the event. The focus of their concern is on the evaluation of a crucial term in Condorcet's formula, namely of the variable that represents the reliability of the witness.

According to a school of thought that had considerable influence at the opening of the nineteenth century (see Reid 1822), the testimony of others ought to be considered at least *prima facie* credible. But the issue then immediately arises of whether or not, in a particular given instance, the default assumption of witness reliability is to be overridden by various countervailing considerations. As the McGrews point out, with respect to the particular context of testimony to the occurrence of the miraculous, one finds a variety of positions on the impact of such further considerations, with some, such as Hume (1748/77), taking these radically to undermine witness credibility and others, such as Campbell (1839), being considerably more sanguine.

The McGrews concur with Venn (1888) in expressing a certain degree of scepticism concerning the possibility of establishing the totality of the facts that would be pertinent to the assessment of witness reliability. They also consider the past track record of a witness's reliability to be only one part of the story in evaluating witness testimony. Unlike Venn, however, who considers only the Condorcet approach, they do not conclude that these considerations undermine the use of probability in the evaluation of testimony. They argue instead in favour of a Bayesian approach that departs from Condorcet's method in that it does not require us to calculate witness reliability as a separate factor. Instead, they suggest what one might want to call an 'holistic' assessment of the impact of witness testimony based on 'evidence about the epistemically relevant features of the witness, the situation in which he testifies, and their interaction'. They argue that Bayes factors are the most useful formal tool for modelling this approach and for incorporating the pertinent facts without running the risk of oversimplification.

The final contribution on this topic is entitled 'Does it Matter whether a Miracle-Like Event Happens to Oneself rather than to Someone Else?'. In this chapter, Luc Bovens investigates the interesting but largely neglected question of the relative impacts of first-person versus third-person experiences of miraculous events with respect to

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religious belief.¹⁰ He sets out to evaluate, from a Bayesian perspective, William Alston's claim that, to the extent that experiencing first-hand a certain kind of miraculous event would warrant belief in God, so too would obtaining the testimony of a trustworthy third party to the effect that an event of that nature occurred (Alston 1991).

Bovens first considers a simple probabilistic model that could at first pass be taken to provide a straightforward vindication of Alston's claim. He then argues, however, that this model fails adequately to represent the nature of the information received by the subject. In particular, it fails to do justice to the fact that the agent, upon learning that a miracle has occurred, also typically thereby learns *that she has learned* this fact. In conjunction with details regarding the so-called 'protocol', which specifies the range of possible informational updates alongside the probabilities of their occurrence conditional on the various possible states of the environment, this additional information can make a dramatic difference to the conclusions that an agent is entitled to draw.

The dangers of failing to take into account this kind of acquisition of higher-order information have long been recognized.¹¹ As Bovens points out, following Pearl (1988), it leads, for instance, to the counterintuitive 'halfer' conclusion in Gardner's Three Prisoners puzzle, a stylistic variant of the well-known Monty Hall puzzle.

With these considerations in mind, Bovens offers an alternative model, built on the kinds of protocols that he takes to be typically associated with, on the one hand, first-person experience of a miracle, and on the other, acquisition of third-person testimony to the effect that a miracle has occurred. He notes that the impact of the acquired evidence is greater in the former case than it is in the latter,¹² and argues that this undermines Alston's claim. He concludes, then, that it *does* matter whether a miracle-like event happens to oneself rather than to someone else.

Part II. Design

Whilst theists have often seen indications of divine intervention in reports of extraordinary goings-on, many have claimed to find evidence for the hand of God in more mundane features of our world. In particular, there is a long tradition, stretching back to classical antiquity, of holding that the existence of entities displaying various particular features, such as the capacity for conscious thought, points to the handiwork of a supernatural designer. Paradigmatic writings in this tradition include Cicero's *De Natura Deorum*, in the first century BC, Aquinas' *Summa Theologiae*, in the thirteenth century, and, in the early nineteenth century, William Paley's *Natural Theology*.

¹⁰ It is worth noting that, in contrast to the other contributions to this section, Bovens does not discuss the credibility of witness reports of the occurrence of a miracle, but rather the extent to which the veracity of such reports would support the theistic position. Despite this difference in focus, his observations and arguments carry over, *mutatis mutandis*.

¹¹ See for instance J. H. Sobel (1992) and G. Shafer (1985).

¹² Measured in terms of the odds of the existence of God conditional on the information received.

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With the advent of evolutionary thinking in the decades following the publication of Paley's book, this etiological hypothesis lost a considerable amount of its appeal: after all, the operation of natural selection on random heritable variation seemed to many to promise a perfectly satisfactory, and more parsimonious, alternative explanation of the facts.

Yet the debate over the inference to design from features of the biological world appears to have enjoyed a new lease of life in recent years. This has been partly spurred on by the somewhat controversial publications of members of the so-called Intelligent Design (ID) movement, who have, *inter alia*, questioned the extent to which evolutionary theory can account for the full extent of the data.¹³

Another factor has been the relatively recent claim that the universe is 'fine-tuned' for life, in the sense that, had the values of various physical constants been only slightly different to what they in fact are, life as we know it would not have been possible.¹⁴ The contention then is that, although evolution by natural selection may well provide a satisfactory account of the biological data *given* that these constants have the values that they do, this fine-tuning *itself* provides evidential support for the intervention of an external agency that the facts of biological evolution do nothing to undermine. In response to this, the so-called 'multiverse' objection points to the existence of an alternative, non-theistic and putatively independently plausible hypothesis that could account for the data. On this view, the world is constituted by an ensemble of universes whose vast and varied nature makes the existence of a fine-tuned universe likely. What's more, the reply goes, it should come as no surprise that we find ourselves contemplating *that* universe rather than any other universe in the ensemble, since fine-tuning is a precondition for the very existence of observers.¹⁵

In his contribution, 'Can Evidence for Design be Explained Away?', David Glass discusses an issue that is of obvious relevance to this debate. Suppose that an observation E provides a certain amount of support for each of two logically compatible hypotheses, H_1 and H_2 , which, if true, would constitute *prima facie* explanations of E . The subsequent discovery that H_1 is true would then undermine the plausibility of H_2 . In Glass's terminology, the *prima facie* evidence E in favour of H_2 has been, to a certain extent, 'explained away' by H_1 .¹⁶

¹³ See for instance M. Behe (1996); and H. Orr (1997) and S. Sarkar (2007) for replies. Other well-known ID theorists include W. Dembski (1998), whose views on probability and inference have been heavily criticized in B. Fitelson C. Stephens and E. Sober (1999), and elsewhere. R. T. Pennock's edited volume contains a sample of views on both sides of the ID debate (Pennock 2001).

¹⁴ See J. Leslie (1989, ch. 2) for an accessible presentation of the case for fine-tuning.

¹⁵ For recent general overviews of the debate over arguments from design, see, for instance, K. E. Himma (2009) and D. Ratzsch (2010). N. Manson's (2003) noteworthy anthology also includes a useful introductory chapter. E. Sober (2005) provides a characteristically lucid discussion of some of the issues from a probabilistic point of view. Chapter ?? of N. Bostrom (2002) contains a discussion of some of the probabilistic literature on fine-tuning.

¹⁶ The terminology of 'explaining away' is due to J. Pearl (1988), who was the first to discuss this kind of phenomenon.

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Glass offers a probabilistic analysis of the phenomenon, according to which H_1 at least partially explains away H_2 with respect to E if and only if the probability of H_1 conditional on the conjunction of E and H_2 is less than the probability of H_1 conditional on E alone. The explaining away is then said to be complete if and only if, in addition, the probability of H_1 conditional on the conjunction of E and H_2 is less than the prior probability of H_1 .

After outlining the precise probabilistic conditions under which partial and complete explaining away do and do not occur, Glass deploys these results in an attempt to evaluate the extent to which the truth of two non-theistic hypotheses would explain away the existence of complex adaptations and cosmological fine tuning (both of which are typically adduced in favour of theism in the context of the argument from design). The two non-theistic hypotheses he considers are the operation of natural selection and the existence of a multiverse.

In the following chapter, entitled ‘Bayes, God, and the Multiverse’, Richard Swinburne, a longtime advocate of the fine-tuning argument (see Swinburne 1990), provides a provocative assessment of the epistemic impact of the multiverse objection. He begins with a concise exposition of his views on the posterior probability of causal explanations of the data, which includes an endorsement of the noteworthy claim that simpler hypotheses ought to be attributed a higher prior probability, *ceteris paribus*, than their more complex counterparts.¹⁷ With this in hand, he turns his attention to assessing the relative prior probabilities and likelihoods of his favoured theistic hypothesis, on the one hand, and its one-universe non-theistic competitor, on the other.¹⁸ Arguing on the basis of the joint claims of the goodness of the existence of humankind and the extreme simplicity of theism, he concludes that the resulting balance of posterior probabilities weighs heavily in favour of theism.

Finally, in two sections of his chapter devoted to the various incarnations of the multiverse hypothesis, Swinburne argues that although the godless multiverse hypotheses is somewhat simpler than the godless one-universe hypothesis, it remains far more complex—and hence, according to him, far less *a priori* probable—than the theistic alternative; largely for this reason, he concludes that consideration of the multiverse scenario has little impact on the force of the argument from fine-tuning.

Part III. Evil

The five chapters in the two previous parts of this volume have dealt with considerations in *favour* of theism. We now turn to one of the best-known considerations *against* it, at least insofar as theism is committed to the existence of a deity of immense

¹⁷ For a more detailed exposition of his views on this matter, see Swinburne (1997). The *locus classicus* of this, not uncontroversial, idea is H. Jeffreys (1961); see C. Howson (1988) for a critical discussion.

¹⁸ Here we mean ‘likelihood’ in the technical sense of the probability of the data conditional on the truth of the hypothesis.

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power, knowledge and goodness: namely, the existence of what *prima facie* appears to be a morally intolerable amount of suffering and hardship in the world.

Whilst, as mentioned earlier, some presentations of the argument from evil, as it is known, appeal to a logical incompatibility between these unfortunate circumstances and the theistic hypothesis (for example, Mackie 1955 or McCloskey 1960), it is now widely acknowledged that this is a somewhat implausibly strong premise to proceed from. After all, appearances to the contrary, it may well prove to be the case that, *all things considered*, allowing the circumstances in question to obtain is morally permissible after all.

A more modest and popular endeavour, whose roots—like those of so many of the other arguments considered in this volume—can be traced back at least as far as Hume’s *Dialogues*, involves arguing from the existence of evil to the mere improbability of theism.¹⁹ As mentioned earlier, this so called ‘evidential’ incarnation of the argument from evil is the focus of the two contributions on this topic to the present volume.²⁰

Richard Otte’s ‘Comparative Confirmation and the Problem of Evil’ addresses the question of whether a lack of belief in the existence of a good reason for God to permit the existence of evil (*U*) does in fact evidentially favour atheism (*NG*) over various forms of theism. His suggestion is that this may not turn out to be the case and that there may even be grounds to claim that the converse holds.

The issue is considered from the vantage point of a number of possible probabilistic analyses of the concept of evidential favouring.²¹ Amongst these, one finds Ian Hacking’s well-known ‘Law of Likelihood’, which states that an item of evidence *E* evidentially favours hypothesis H_1 over competing hypothesis H_2 if and only if the probability of *E* conditional on H_1 is strictly greater than that of *E* conditional on H_2 (see Hacking 1965). But Otte also considers a number of alternatives to the Law of Likelihood that have recently been put up for discussion by Branden Fitelson.²² These alternatives formalize, in various ways, the idea that *E* evidentially favours H_1 over H_2 if and only if *E* raises the probability of H_1 more than it does the probability of H_2 .

Otte argues that on all the analyses of evidential favouring discussed, his guiding question should be answered in the negative: lack of belief in the existence of a good reason for God to permit the existence of evil (*U*) does not in fact evidentially favour atheism (*NG*) over various forms of theism. More specifically, he offers considerations that he takes convincingly to undermine the claim that *U* favours *NG* over a particular brand of theism, namely, ‘sceptical theism’, that takes the intentions of God to be inscrutable (*UG*).

¹⁹ See Part 11 of Hume’s *Dialogues Concerning Natural Religion* (Hume 1779).

²⁰ Noteworthy proponents of the evidential argument include W. Rowe (1979, 1991) and P. Draper (1989). For general overviews of the issues, see M. Tooley (2010) and N. Trakakis (2006). D. Howard-Snyder (1996) provides an important anthology on the topic.

²¹ Also known as ‘contrastive’, ‘comparative’, or, again, ‘relational’ confirmation.

²² The locus for the various alternatives to the Law of Likelihood is B. Fitelson (2007). J. Chandler (forthcoming) argues that these alternatives flout various intuitive desiderata. See B. Fitelson (forthcoming) for further discussion.

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He claims that to the extent that one can even assess the relative magnitudes of $\Pr(U|NG)$ and $\Pr(U|UG)$, there may be a case to hold that the former is no higher, or even strictly lower, than the latter. Merely holding that $\Pr(U|NG)$ is no higher than $\Pr(U|UG)$ would be sufficient to establish his conclusion on the assumption that the Law of Likelihood provides a suitable account of evidential favouring. However, appealing to a well-known result reported by Fitelson,²³ he further notes that even if it were the case that $\Pr(U|NG)$ was lower than $\Pr(U|UG)$ it would still suffice to establish his conclusion on any of the various alternative analyses of favouring that he considers.

However, the standing of sceptical theism is called into question in the following chapter by Michael Tooley, 'Inductive Logic and the Probability that God Exists: Farewell to Sceptical Theism'. Here Tooley offers a further development of the treatment of the argument from evil advanced in his recent joint volume with Alvin Plantinga (Plantinga and Tooley 2008).

Tooley sets out to evaluate a crucial premise in the evidential argument from evil: the claim that our living in a godless world is more probable than not, conditional on the occurrence of what he calls 'morally problematic' events. He takes such events to be those whose *known* properties are, on balance, morally undesirable.

He argues that this premise is defensible. More specifically, he shows that, under certain 'Carnapian' assumptions regarding prior probabilities (see Carnap 1962), assumptions that he takes to be rationally mandated, one can place a strikingly low upper bound on the prior probability of the following: its being the case that, for every event e in a reasonably small set of n events, the *totality* of the properties of e is not, on balance, morally undesirable, conditional on its being the case that, for every e , the known subset of the properties of e is on balance morally undesirable.

This is a remarkably strong result. Indeed, if one grants Tooley's Carnapian assumptions about the priors, it holds even under complete ignorance both (a) of the number k of unknown morally relevant properties of the events, and (b) of the proportion r of those properties that are morally desirable rather than not.

Tooley obtains what he is after by first establishing an upper bound for the relevant probability given knowledge of both k and r , before generalizing to the cases in which first knowledge of r and then knowledge of both k and r are dropped.

Part IV. Pascal's Wager

The previous sections have all dealt with considerations that are purportedly relevant to the rationality of theistic or atheistic belief by virtue of being *indicative of its truth*. It has been argued, however, that there are reasons for belief whose rational import lacks

²³ Namely the so-called 'Weak Law of Likelihood', which is a shared consequence of a number of alternatives to the Law of Likelihood, and states that E favours H_1 over H_2 if and only if $\Pr(E|H_1) > \Pr(E|H_2)$ and $\Pr(E|\text{not-}H_1) \leq \Pr(E|\text{not-}H_2)$. See B. Fitelson (2007).

this evidential character. Such putative reasons are sometimes termed ‘pragmatic’ or ‘prudential’, as they involve facts about the value or perceived value of a belief given different states of nature.²⁴

There are several arguments for theism that appeal to pragmatic considerations.²⁵ Undoubtedly, however, by far the most famous of these are the variants of Blaise Pascal’s so-called ‘wager’, which appear in the section entitled ‘*Infini Rien*’ in his *Pensées*.²⁶

Whilst the general lines of the wager can be found in the writings of a substantial number of earlier scholars,²⁷ it is widely recognized that Pascal’s presentation is the first one to exhibit a distinctly modern decision-theoretic flavour.²⁸ In an influential article, Ian Hacking (1972) offered what have now become the standard formal reconstructions of three versions of the argument that are allegedly to be found in the *Pensées*. All three arguments proceed from claims regarding the payoffs, a , b , c , and d , respectively associated with (i) belief in God given God’s existence (handsomely rewarded in the afterlife), (ii) belief in God given God’s non-existence, (iii) non-belief in God given God’s existence (possibly liable to punishment), and (iv) non-belief in God given God’s non-existence.

The first variant of the wager is the ‘Argument from Dominance’, so-called because it proceeds to the conclusion that one ought to believe in God from the simple claim that belief in God ‘weakly dominates’, in decision-theoretic terminology, non-belief: $a > c$ but $b \geq d$.²⁹

The Argument from Dominance makes no claim regarding the probability of God’s existence; nonetheless it makes strong claims about payoffs. The second variant of the wager, however, the ‘Argument from Expectation’, pursues a different strategy. It trades some of the strength of this claim about payoffs for a weak claim about probabilities, namely a claim that the existence and non-existence of God are equiprobable. Given this latter claim, if one merely further assumes that $a - c > d - b$, it follows that the expected utility of believing in God exceeds that of not doing so. From this comparison of expectations, it is then concluded that one ought to believe in God.

The final argument, which is probably the best known version of the wager, is the ‘Argument from Dominant Expectation’. It drops the premise of equiprobability,

²⁴ It is worth pointing out that this terminology may be somewhat unhelpful insofar as it suggests that the truth of a belief is of no practical significance. ‘*Merely* pragmatic’ or ‘*merely* prudential’ may be more apt.

²⁵ For instance William James advances a pragmatic argument in his essay, first published in 1896, ‘The Will to Believe’ (James 1956); see J. Jordan (2011) for an overview.

²⁶ One commonly-cited edition of the *Pensées* is L. Lafuma’s (Pascal 1963). Popular translations into English include those of A. J. Krailsheimer (Pascal 1966) and, more recently, H. Levi (Pascal 1995).

²⁷ See J. Ryan (1945) for a discussion of various historical precursors of the wager.

²⁸ For brief introductions to the basic principles of decision theory, see for instance J. Joyce (2006) or M. Machina (2005), the latter also covering a range of heterodox accounts of rational choice. M. Resnik (1987) provides a gentle, book-length overview aimed at a philosophical audience, as does M. Petersen (2009), who covers essentially the same ground from a similar perspective. A more rigorous, but consequently more demanding, survey is provided in D. Kreps’ excellent textbook (Kreps 1988).

²⁹ More precisely, the conclusion should be that one ought to *take steps that would lead one to* believe in God. We ignore this distinction in what follows.

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and secures a comparatively superior expected utility of belief in God by assuming a non-zero probability for the existence of God, a positively infinite value of a , and a finite value of b , c , and d . Indeed, the joint upshot of these assumptions is a positively infinite expectation of wagering for God versus a finite expectation of wagering against. Again, it is then concluded from this that rationality mandates belief in God.

Even if one brackets the general debate over the very existence of non-evidential reasons for belief,³⁰ the wager remains a controversial argument to say the least.³¹ Most criticisms, however, granting the validity of the various incarnations of the wager reviewed above, cast doubt instead on the plausibility of the premises involved. Alan Hájek's contribution to the present volume, 'Blaise and Bayes', is not so concessive. Instead he contends that all three of Hacking's reconstructed variants of the wager are invalid in their original form and he takes the opportunity, along the way, to set straight a number of mistakes in the secondary literature.

His first port of call is the Argument from Dominance. He argues that the argument is invalid as it stands and that, contrary to what has been claimed in the literature, it could only be rescued by adducing one of two further strong premises. One must either assume a positive probability for the existence of God or appeal to what he calls a 'superduperdominance', rather than mere weak dominance, of wagering for God, claiming that the best consequence of not wagering for God is strictly inferior to the worst consequence of not wagering for God (assuming that $a \geq b$ and $d \geq c$, this amounts to the claim that $d < b$).

He then turns his critical eye onto the Argument from Dominating Expectation. Here he reiterates the worry that he developed in an earlier article, namely that the argument fails due to the possibility of opting for a so-called 'mixed strategy', a strategy that merely accords a positive, though non-unit, probability to wagering for God (see Hájek 2003). Given the infinite value of payoff a , any such strategy will, like the 'pure' strategy of wagering for God with probability 1, have a positively infinite expected utility. The upshot of this is that wagering for God is not the uniquely rationally permissible choice.

In his earlier article, Hájek considered four possible ways of fixing the wager (see, again, Hájek 2003)—each of which, as he observed, seemed to be incompatible with Pascal's religious views. In his contribution to this volume, Hájek discusses two further options for rescuing the wager, both of which involve taking c to be negatively

³⁰ There is a substantial and rapidly growing literature on this issue. Expressions of scepticism can be found in J. Adler (2002), T. Kelly (2002), and N. Shah (2006). For dissent, see A. Reisner (2009). It is worth noting that some of those who deny that there can be non-evidential reasons to believe simultaneously concede that there can be non-evidential reasons to *cause oneself* to believe (for example, Shah 2006).

³¹ For some general discussions of the recent critical literature, see A. Hájek (2008) and P. Saka (2002). Chapter 13 of J. H. Sobel (2004) offers a slightly more technically demanding overview. J. Jordan (1994) provides an important collection of essays on the topic.

infinite. One of these, he argues, appears to have the advantage of being faithful to Pascal's theology and yields the desired conclusion, given the conservative extension of standard decision theory that he proposes.

But the introduction of mixed strategies is not the only expansion of the set of choices with respect to the wager that is considered in the literature. Another widely-discussed source of variety is the possibility of wagering for alternative would-be deities. This is the root of Diderot's so-called 'Many Gods' objection (Diderot 1875–7, LIX). By suitably expanding the decision matrix, one can introduce alternative wagers whose desirability is on par with that of wagering for God.

The next contribution to this volume, Paul Bartha's 'Many Gods, Many Wagers', discusses a collection of decision problems which bring into play more than one deity to wager for. The first case discussed is one in which the agent considers a finite set of mutually exclusive theistic possibilities, of the form 'Only God_{*n*} exists', and a corresponding set of possible wagers, where the payoff for wagering for God_{*n*}, given that only God_{*n*} exists, is positively infinite and the payoff for wagering for God_{*m*} ($m \neq n$) in the same circumstances is finite. Intuitions dictate that one ought to wager for the deity whose existence one judges to be most probable. The principle that delivers this intuition is sometimes known as 'Schlesinger's Principle' (after Schlesinger 1988). It states that, of a set of acts that have positively infinite expected utility, it is only permissible to choose an act that maximizes the probability of achieving an outcome with positively infinite utility. Here Bartha provides a useful summary of his own recent work on relative utility theory—a generalization of classical decision theory devised to cope with decision problems involving infinite utilities (Bartha 2007)—and shows that, contrary to how matters might have originally appeared, Schlesinger's Principle can be recovered from this framework.

However, the bulk of Bartha's contribution focuses on providing an innovative model of rational deliberational dynamics that handles the somewhat unusual character of the acts involved in Pascalian decision problems. Indeed, in line with Hacking, he understands the act of wagering for—respectively, against—a deity as taking steps that will increase to 1—respectively, decrease to 0—one's assessment of the probability of that deity's existence (see Hacking 1972: 188). But since decisions to wager are themselves grounded in such probability assessments, this leaves open the possibility of a rather peculiar kind of decision instability: making a wager that undermines the very grounds that one had for choosing it.

To illustrate, consider a Pascalian decision problem involving a partition of two possible states of nature: the state in which a grouchy god exists and the state in which no god at all exists. Grouchy gods reward those who wager against them with a good of positively infinite value. In the remaining cases a merely finite payoff is received. According to standard infinitistic decision theory, one ought to wager against the grouchy god if and only if one grants a strictly positive probability to his existence. But consider an agent whose initial probabilities incline them to wager against. As their

confidence in the non-existence of the grouchy deity goes to 1, their initial impetus for the wager is lost: wagering against is rationally self-defeating.

There is an interesting parallel with frequency-dependent selection in evolutionary dynamics here. Consider the case of a simple anti-correlation game such as the game of Hawk and Dove (Maynard Smith and Price 1973). An aggressive hawkish strategy yields high dividends when played against a passive, dove-ish strategy, but leads to disastrous consequences when played against itself. Assuming random pairing of players, a low population frequency of hawks yields a low probability of playing against a hawk. This favours the differential replication of hawks at the expense of doves. However, as the frequency of hawks increases, the probability of playing against a hawk increases, and the fitness of playing hawk decreases, accordingly. One could say that, in a certain sense, the (pure) strategy of playing hawk is evolutionarily self-defeating.

This parallel is exploited by Bartha in his proposed model of rational deliberational dynamics for Pascalian decision problems.³² He offers a model whose key advantage is that it allows the probabilities of making the different wagers to evolve over time, increasing proportionally to their relative expected utility. He then proposes that a (possibly mixed) wagering strategy is choice-worthy only if its probability vector corresponds to a certain kind of equilibrium in the deliberation dynamics.

Bartha wraps up his argument by applying this framework to various ‘many gods’ Pascalian decision problems, observing that a number of theistic wagering strategies (that is, strategies that consist in equal mixtures of wagers for particular deities) turn out to be robustly choice-worthy. This, he concludes, provides a limited defence of Pascal’s wager.

Part V. Faith and Disagreement

The notion of rational belief has, in one way or another, been at work in all of the essays in this volume, although it came to the fore in the previous section. There is a long tradition in philosophy of religion, and in its predecessor philosophical theology, of reflection on the rational standing of religious belief—most especially, belief in the core tenet of theism: that God exists. Within this tradition, opinion has remained polarized over whether faith is or is not rational. As the early Christian apologist, Tertullian (c.160–220), exclaimed: What has Athens to do with Jerusalem?³³ Athens, of course, here represents philosophy or reason, while Jerusalem represents faith. While there are scholarly disagreements about exactly how Tertullian’s remark should be interpreted,

³² Despite the novelty of his model, Bartha was not the first to discuss a possible connection between the dynamics of deliberation and the dynamics of evolution by natural selection. B. Skyrms (1994) highlights parallels between both (i) Jeffrey’s evidential decision theory and evolutionary dynamics under correlated interaction, and (ii) Savage’s causal decision theory and evolutionary dynamics under random interaction.

³³ See Tertullian, *De Praescriptione haereticorum* 7.9.

his point is usually taken to be that religious faith does not require the support of reason and, in that sense, it is irrational. Despite its rhetorical appeal, and its ability to explain why there is so much disagreement about matters of religious conviction, this view has never completely won out over the view that faith and rationality can be successfully partnered.

Although a Wittgensteinian form of fideism enjoyed undeniable influence within philosophy of religion in the 1970s and 1980s,³⁴ the view that religious belief is irrational (or, in some versions, arational) has never been the dominant position within the discipline. Instead philosophers of religion have been understandably reluctant to give up the idea that it can be rational to have faith, and many have been more sympathetic to Anselm of Canterbury's (1033–1109) well-known vision of faith seeking understanding than they have to Tertullian's position. In recent times the effort to articulate the relationship between faith and reason has increasingly led philosophers of religion to explore different models of rational belief and to test their applicability to the religious domain.³⁵ This project is being pushed forward with the help of increasingly sophisticated ways of thinking about the relationship between rationality and probability. The final two essays in this volume engage with this project and each seeks to expand our understanding of the connection between, probability, rationality and belief in the context of theism.

In his 'Does Religious Disagreement Actually Aid the Case for Theism?', Joshua Thurow argues against the popular claim that mutually recognized disagreement among rational peers with respect to a given proposition P would invariably lead to suspension of judgement as to whether or not P .³⁶

He contends that the dynamics of belief under revealed disagreement must be sensitive to the justificatory structure of the agents' beliefs: suspension of judgement is indeed mandated under revealed disagreement, but *only* with respect to the agents' *basic* beliefs, those beliefs from which the remainder of their beliefs are derived.

He motivates his claim with an example, the 'disagreeing detectives case', whose schematic structure is as follows: Two rational, equally cognitively competent and well-informed agents agree on a basic body of evidence E which, taken alone, would warrant an inference that P . They also agree that adding the further proposition Q to this body of evidence would override the inference, licensing instead a conclusion that not- P . They disagree, however, as to whether or not Q , with one agent holding that Q and the other that not- Q . The upshot of this is a derivative disagreement, in turn,

³⁴ This was inspired by certain remarks in Wittgenstein's *Philosophical Investigations* (1959) and his *Lectures and Conversations on Aesthetics, Psychology & Religious Belief* (1966). D. Z. Phillips and Norman Malcolm were both prominent proponents of this approach to philosophy of religion. See, for example, Phillips (1970, 1971, 1986, and 1988) and Malcolm (1977).

³⁵ The Reformed Epistemology movement, discussed earlier, is part of this trend.

³⁶ In the context of theistic belief, this view has been most notably espoused by R. Feldman (2007). See Thurow's contribution to this volume for further references.

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as to whether or not P . After mutual revelation of their respective beliefs, the agents suspend judgement on the basic issue of whether or not Q . And this, Thurow argues, then leads to an agreement that P .³⁷

The structure of this example, he argues, may well be instantiated in the context of religious disagreement. Here he suggests that we could, for instance, find agreement among peers regarding the existence of various witness reports to the occurrence of some miraculous event (E). This, taken alone, may warrant an inference to the existence of God (P). The peers could further agree that were one to grant the claim that various collectively endorsed beliefs are in tension with the claims of theism (Q), the resulting total body of evidence would however, on balance, warrant an inference to not- P . But the peers disagree about whether or not Q , and consequently about whether or not P . After disclosure of their respective beliefs the agents then come to an agreement that P .

In addition to these informal considerations, Thurow offers a probabilistic model that he takes to vindicate his claims, drawing on a distinction between foundational and non-foundational aspects of an agent's probabilistic credence function. On his model, after mutual disclosure of their respective credences, agents average foundational degrees of belief, then let these opinion shifts at the foundational level percolate through to the remainder of their credences.

In the final contribution to this collection, Lara Buchak develops an account of the attitude of having faith in a proposition, and discusses the conditions under which, given this account, one could provide a positive answer to the titular question of her article: 'Can it be Rational to Have Faith?'

After exploring, and eventually rejecting, a number of alternative proposals, Buchak settles for an account according to which having faith that P entails having a commitment to decline to obtain any further evidence as to whether or not P prior to acting on the supposition that P (in other words, having a preference to remain ignorant of such further evidence).

With this account of the attitude of having faith in hand, she turns to the question of the rationality of faith, and in particular, to the rationality of declining to obtain further information prior to acting. As Buchak notes, there are a number of circumstances under which such behaviour is clearly permissible, and indeed mandated by the canons of rationality: there may be various costs associated with the acquisition of further information that outweigh any potential benefits that this acquisition may bring.

But, as she also points out, the putative rationality of declining cost-free information sits somewhat uneasily with a well-known result due to I. J. Good (1967). According

³⁷ It is worth noting, as Thurow acknowledges, that this kind of situation would appear to be proscribed by a condition known in the literature on belief revision as 'Preservation'. Indeed, according to the Principle of Preservation, it is irrational to suspend judgement on an item of information (such as Q) whose assimilation would lead to the retraction of one's current beliefs (such as the belief that P). The upshot of this would be that, in view of the fact that adding Q to E would license the inference that not- P , it cannot be the case that Q , taken by itself, licenses the inference that P .

to Good's Theorem, granting standard expected utility theory and a number of weak auxiliary assumptions, the option of obtaining cost-free information prior to acting is weakly preferable, and in some cases strictly preferable, to the option of declining it.

So is it then irrational to have faith, on Buchak's analysis of the concept? Not necessarily so, she avers. Building on her earlier work, she argues that, on some independently-motivated generalizations of expected utility theory, Good's result no longer holds: in such frameworks, under certain circumstances, declining cost-free information can be strictly preferable to obtaining it (see Buchak 2010).³⁸

Future Directions

Perhaps it is this last topic of 'Faith and Disagreement' that points us most squarely towards the future direction of philosophy of religion. Once again, as in the mid-twentieth century, philosophy of religion seems to be undergoing a time of rapid evolution in response to a number of pressures. It could be argued that the most important factor impacting the discipline today is the increasingly urgent requirement that it should take into account the diversity of religious conceptions available while developing to include a broader range of topics than those that fell within its traditional disciplinary purview. That purview was largely limited to issues concerning the existence and nature of God, as God is conceived within Western forms of theism. Such issues are now often regarded as only one part of the domain of inquiry that philosophers of religion might be concerned with (see Schellenberg 2008; Harrison 2010).³⁹

While the chapters in this volume each demonstrate the continued fecundity of ongoing philosophical examination of the central tenets of Western theism, they also invite further studies which will deploy the tools of probabilistic thinking in the context of the expanded domain of the philosophy of religion of the future. It remains to be seen how probability theory can contribute to this exciting and urgent new phase in the development of the discipline. However, judging by the work presented in this volume, we can expect that the interplay of probabilistic reasoning and philosophy of religion—which has been so fruitful over the last several decades—will make a valuable contribution to the emergent new style of philosophy of religion.

The chapters contained here have showcased the extent to which philosophy of religion has successfully assimilated probability theory. But they also point the way to future work in philosophy of religion that, building on what has already been achieved, will be positioned to engage even more fully with the very latest refinements that are

³⁸ It is worth noting that T. Seidenfeld (2004) *criticizes* various generalizations of expected utility theory—in particular the coupling of set-based Bayesianism with the so-called 'Γ-Maximin' decision rule—for having precisely this kind of consequence. One person's *modus ponens* is another's *modus tollens*, as they say.

³⁹ The importance of this trend is evident in the steadily increasing number of books aimed at undergraduates taking seriously ideas and arguments concerning a range of different religious conceptions. Some of the best examples are: C. Taliaferro (1998), K. Yandell (1999), and G. Griffith-Dickson (2000 and 2005).

even now emerging from the workshops of probability theorists. We conclude this introduction, then, by expressing our confidence that probability theory will continue to enjoy a profound influence on philosophy of religion for some time to come.

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