Twenty Questions about Hume's "Of Miracles"

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Hume's essay on the credibility of miracle reports has always been controversial,[1] with much debate over how it should be interpreted, let alone assessed. My aim here is to summarise what I take to be the most plausible views on these issues, both interpretative and philosophical, with references to facilitate deeper investigation if desired. The paper is divided into small sections, each headed by a question that provides a focus. Broadly speaking, §§1-3 and §20 are on Hume's general philosophical framework within which the essay is situated, §§4-11 and §19 are on Part 1, §12-18 are on Part 2, and the final three sections §§18-20 sum up my assessment of his arguments.

1. Is "Of Miracles" consistent with Hume's inductive scepticism?

Hume's discussion of miracles is commonly alleged to be in serious tension with the somewhat sceptical views developed earlier in both the *Treatise* and the *Enquiry*.[2] Traditionally, he has been interpreted as an extreme sceptic about induction, one who argues that "as far as the competition for degrees of reasonableness is concerned, all possible beliefs about the unobserved are tied for last place" (Stroud 1977, p. 54). And if this is his view, then the case he makes in "Of Miracles" – that miracle stories cannot be inductively established – seems a pointless exercise. To such an undiscriminating sceptic, belief in Jesus's resurrection, or a weeping statue, or any other alleged miracle, must be no less (and no more) justified than commonplace inductive beliefs such as that the Sun will rise tomorrow, or that my pen will fall if released in mid-air. Is he not then simply inconsistent in comparing miracle stories unfavourably with everyday and scientific inductions?

If there is indeed an inconsistency here, however, this is more a difficulty for Hume's philosophy of induction than for his position on miracles. Most of his work – from the *Treatise*, through the *Essays* and *Enquiries*, to the *History* and the later works on religion – is thoroughly infused with the empirical scientific spirit of an investigator attempting "to introduce the experimental method of reasoning into moral subjects" (as declared by the subtitle of the *Treatise*). In this respect, the inductive commitment of his essay on miracles is entirely typical. And in fact there is no inconsistency between Hume's philosophy of induction and his empirical method; quite the reverse. His inductive "scepticism" – as presented in Sections 4 and 5 of the *Enquiry*, is encapsulated in the claim "that, in all reasonings from experience, there is a step taken by the

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[1] Hume's *Enquiry* was originally published as *Philosophical Essays concerning Human Understanding*. Hence Section 10, which provoked controversy right from the start, quickly became known as his "essay" on miracles.

[2] For example by Broad (1917, p. 92), Flew (1961, p. 171), and Larmer (1996, pp. 29-32).

mind, which is not supported by any argument or process of the understanding" (*E* 5.2). This unsupported step – the assumption of uniformity whereby we extrapolate from observed to unobserved and "expect similar effects from causes, which are, to appearance, similar" (*E* 4.23) – has instead a non-rational basis, in an animal instinct which Hume calls *custom* (*E* 5.6). Later, in Section 9, he goes on to highlight the corollary, that human inference to facts about the unobserved is fundamentally similar to that of the animals, based not on rational insight into how things behave, but instead on a crude natural instinct to expect more of the same. All this has a sceptical potential which Hume fully recognises (*E* 12.22), but he does not follow it through by claiming that all induction is equally worthless, and instead proceeds to build *positively* on his crucial result, by emphasising our *need* for the assumption of uniformity rather than its non-rational basis. Any sceptic who urges us to discard it "must acknowledge, if he will acknowledge any thing, that all human life must perish, were his principles universally and steadily to prevail" (*E* 12.23). So we are stuck with the assumption of uniformity, because we cannot live without it and are anyway psychologically unable to abandon it; moreover the sceptic can provide no persuasive reason why we should not rest content with it. Though not itself rationally founded, therefore, it is worthy of our assent, and is even able to provide an appropriate criterion of rational empirical judgement. Thus the upshot of Hume's "mitigated scepticism" (*E* 12.24) is not to undermine human reason, but rather to bring us face to face with its nature and humble animal origins. Induction remains "that reasoning, which can alone assure us of any matter of fact or existence" (*E* 7.27), and hence it is on induction that we must rely if we are to have any well-founded belief concerning such matters of fact as the trustworthiness of reporters and the occurrence (or non-occurrence) of miracles. There is thus no inconsistency whatever between Hume's "scepticism" concerning induction and his inductive assessment of the evidence for miracles.

2. What does Hume mean by "probability" and "proof"?

Even once the general principle of inductive extrapolation from observed to unobserved has been accepted, such inference is not always straightforward, because our experience is not entirely uniform. Section 6 of the *Enquiry*, "Of Probability", considers how psychological associative processes, analogous to custom, operate to generate proportionate degrees of belief in such cases. But it is at the beginning of his discussion of miracles that Hume casts this issue most clearly into a *normative* light, showing how a commitment to induction can point the way towards appropriately *rational* judgements. Observation teaches us that some patterns in our experience have been uniform, whereas others have varied; hence induction itself should lead us to expect a similar mix of uniformity and variety in the future. Hume accordingly draws a distinction between induction from phenomena which have been "found, in all countries and all ages, to have been

constantly conjoined together", and induction from those which "have been more variable" (*E* 10.3). In the next paragraph, he will use some technical terminology to capture this distinction, a refinement of a standard dichotomy inherited from John Locke.

Locke's *Essay concerning Human Understanding* of 1690 had influentially drawn the distinction between *demonstrative* and *probable* reasoning (*Essay* IV xv 1), roughly equivalent to the modern distinction between *deductive* and *inductive* arguments. In *Treatise* Book 1 Hume follows this Lockean usage, but at *T* 1.3.11.2 he remarks that it is infelicitous, in a passage largely repeated in the *Enquiry*:

> Mr. LOCKE divides all arguments into demonstrative and probable. In this view, we must say, that it is only probable all men must die, or that the sun will rise to-morrow. But to conform our language more to common use, we ought to divide arguments into *demonstrations*, *proofs*, and *probabilities*. By proofs meaning such arguments from experience as leave no room for doubt or opposition. (*E* 6.0 n. 10 – footnote to the title of Section 6 "Of Probability")

In the *Enquiry*, Hume accordingly reserves the term "probable" for inferences specifically from *inconstant* experience.[3] And so he speaks instead of "moral reasoning" or "reasoning concerning matter of fact" when he wishes to refer to the broader Lockean category of non-demonstrative reasoning, which encompasses both *probabilities* and *proofs*. A proof, thus understood, is an inference from *constantly repeated and exceptionless* experience, such as my inference that the sun will rise tomorrow, based on my uniform experience of its having risen every day in the past. It is this technical sense of "proof" which Hume intends throughout his discussion of miracles, for example in the famous passage that immediately follows the *E* 10.3 paragraph quoted above:[4]

> A wise man, therefore, proportions his belief to the evidence. In such conclusions as are founded on an infallible experience, he … regards his past experience as a full *proof* of the future existence of that event. In other cases, he proceeds with more caution: … He considers which side is supported by the greater number of experiments: To that side he inclines, with doubt and hesitation; and when at last he fixes his judgment, the evidence exceeds not what we properly call *probability*. All probability, then, supposes an opposition of experiments and observations, where the one side is found to overbalance the other, and to produce a degree of evidence, proportioned to the superiority. (*E* 10.4)

The remainder of Section 10 is devoted to spelling out the implications of this prescription of wisdom, as applied to the specific case of testimony for supposed miracles.

3. Is "Of Miracles" philosophically serious, or a scurrilous addition?

Sir Amherst Selby-Bigge, in the Introduction to his edition (1894, §5 and §12), influentially

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[3] With the exception of *E* 4.19, which refers to "probable arguments" in the broader Lockean sense.

[4] Hume does sometimes use the term in a more everyday sense, for example at *E* 7.14, 8.14, 8.22 n. 18, 11.30.

alleged that Hume included the discussion of miracles in the first *Enquiry* merely to spice up the work and provoke public notoriety, rather than for any serious philosophical purpose. But this dismissive judgement is quite wrong. First, the essay is of significant philosophical interest in its own right, and provides the most developed application of Hume's theory of induction to a case of conflicting evidence, showing how in practice he combines his general epistemology of mitigated scepticism with normative critical standards.[5] Secondly, his choice of topic for this role is by no means gratuitous, because testimony was central to the early-modern discussion of non-demonstrative evidence, as one of the two *grounds of probability* identified by Locke:

> … The *grounds of [Probability]*, are, in short, these *two* following: *First*, The conformity of any thing with our own Knowledge, Observation, and Experience. *Secondly*, The Testimony of others, vouching their Observation and Experience. (*Essay* IV xv 4)

So it is quite natural that Hume – having devoted Sections 4-6 of the *Enquiry* to the first of these grounds (i.e. conformity with our own observation and experience) – should go on to discuss testimony. And it is also entirely typical of the time that such a discussion should culminate with a consideration of miracles, just as it had with Locke:

> Though the common Experience, and the ordinary Course of Things have justly a mighty Influence on the Minds of Men … yet there is one Case, wherein the strangeness of the Fact lessens not the Assent to a fair Testimony given of it. For where such supernatural Events are suitable to ends aim'd at by him, who has the Power to change the course of Nature, there, under such Circumstances, they may be the fitter to procure Belief, by how much the more they are beyond, or contrary to ordinary Observation. This is the proper Case of *Miracles* … (*Essay* IV xvi 13)

Hume wholeheartedly agrees with Locke that, in general, claims contrary to "the ordinary Course of Things" are to that extent less credible. Where he most conspicuously differs from Locke is in denying that miracles should constitute any exception to this general rule.

4. Is Hume right to treat testimonial evidence as inductive?

Hume's treatment of testimony starts by applying his previously stated principles of probability:

> To apply these principles to a particular instance; we may observe, that there is no species of reasoning more common, more useful, and even necessary to human life, than that which is derived from the testimony of men … our assurance in any argument of this kind is derived from no other principle than our observation of the veracity of human testimony, and of the usual conformity of facts to the reports of witnesses. (*E* 10.5)

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[5] This illustrates the point made in §1 above, that Humean "inductive scepticism" is entirely compatible with drawing distinctions between strong and weak inductive evidence (according to how well each inference conforms to the basic assumption of underlying uniformity). His "scepticism" is not indiscriminate, because he insists that the Pyrrhonian's "undistinguished doubts" should be "corrected by common sense and reflection" (*E* 12.24)

He then follows through his argument of *Enquiry* Section 4 by insisting that the "general maxim" (*E* 10.5) established there – that all inference to unobserved matters of fact depends on extrapolation from experience – applies just as much to testimonial evidence as to any other. So while Locke treated testimony as a second, and apparently independent, "ground of probability", Hume effectively reduces it to a form of inductive evidence.[6] He goes on to refine this approach, by taking into account the specific nature of the testimony:

> And as the evidence, derived from witnesses and human testimony, is founded on past experience, so it varies with the experience, and is regarded either as a *proof* or a *probability*, according as the conjunction between any particular kind of report and any kind of object has been found to be constant or variable. … Where … experience is not entirely uniform on any side, it is attended with an unavoidable contrariety in our judgments, and with the same opposition and mutual destruction of argument as in every other kind of evidence. …
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> This contrariety of evidence … may be derived from several different causes; from the opposition of contrary testimony; from the character or number of the witnesses; from the manner of their delivering their testimony; or from the union of all these circumstances. … There are many other particulars of the same kind, which may diminish or destroy the force of any argument, derived from human testimony. (*E* 10.6-7)

Again we see echoes of Locke, who had mentioned the "number", "integrity", and "skill" of the witnesses, and the "consistency" and "circumstances" of the testimony (*Essay* IV xv 4), but gave no indication of how these are to be weighed against each other. Hume fills this gap by explaining – consistently with his inductive methodology – that any such judgement should depend on how reliable the testimony of each kind has actually turned out to be in practical experience.

It is sometimes objected that testimony cannot be "reduced" to induction in this way, because it serves as a fundamental source of information which must be accepted as reliable from the start if we are ever to learn anything significant.[7] Hume's own discussion, moreover, seems to take for granted that we know from personal experience various things – such as that all men must die – which in practice are known almost entirely on the basis of others' testimony and hence *their* experience. So unless we start by accepting that their testimony can be relied on, it seems that we cannot acquire this broader experience on which our inductions are supposed to be based. Fortunately we know Hume's response to this objection, which was pressed by George Campbell (1762, I §2, pp. 37-8). In a 1761 letter to Hugh Blair (who had sent him Campbell's manuscript), Hume implicitly acknowledges that his use of "experience" is ambiguous:

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[6] The same treatment is sketched in the *Treatise* at *T* 1.3.9.12, which briefly anticipates its application to miracles.

[7] See in particular Coady (1973) and Coady (1992) chapter 4. Traiger (1993) mounts a defence, arguing that Hume does not presuppose an epistemically individualist and reductionist conception of testimony.

Sect. II. No man can have any other experience but his own. The experience of others becomes his only by the credit which he gives to their testimony; which proceeds from his own experience of human nature. (*HL* i 349; Hume 1748, p. 165)

Here he appears to be saying that although *strictly*, all experience is personal, nevertheless facts attested by those one trusts (such trust being based on personal experience) can *appropriately* be accorded the same honorific status. He also makes similar remarks in the *Enquiry* itself and in his essay "Of the Study of History" (para. 6), saying how reading and conversation can "enlarge … the sphere" of our experience (*E* 9.5 n. 20) and even "extends our experience to all past ages" (*Essays*, p. 566). In "Of Miracles", at least, the ambiguity indeed seems harmless. After all, Hume is not here taking issue with ordinary facts founded on widespread and concurrent reports: these are not in dispute, and so can be accepted as though they were personally experienced. The debate concerns only claims that are generally recognised to be extraordinary, outside the common course of nature, and moreover widely disputed. Someone might reasonably decide to investigate these kinds of claims more critically than others, but there is no reason why suspension of belief in them should imply any general rejection of testimony. Indeed one reasonable way of proceeding might be to develop the inductive measures that Hume recommends, by assessing – both on the basis of our own personal experience *and* the accepted testimony of others (including, possibly, academic literature on cognitive biases) – what kinds of testimony are most to be trusted. In short, Hume has no need to dispute the claim that we must start by taking testimony for granted to build our knowledge of the world.[8] But this in no way impugns his proposed targeted investigation of testimony for alleged miracles, nor his pursuing that investigation on inductive principles.

5. How does Hume apply these principles to the case of miracles?

It is only after having set out his general approach to the assessment of testimony, and having drawn attention to a range of relevant factors (as quoted from *E* 10.6-7 above), that Hume turns his attention – in the very next sentence – towards the topic of the miraculous:

Suppose, for instance, that the fact, which the testimony endeavours to establish, partakes of the extraordinary and the marvellous; in that case, the evidence, resulting from the testimony, admits of a diminution, greater or less, in proportion as the fact is more less unusual. (*E* 10.8)
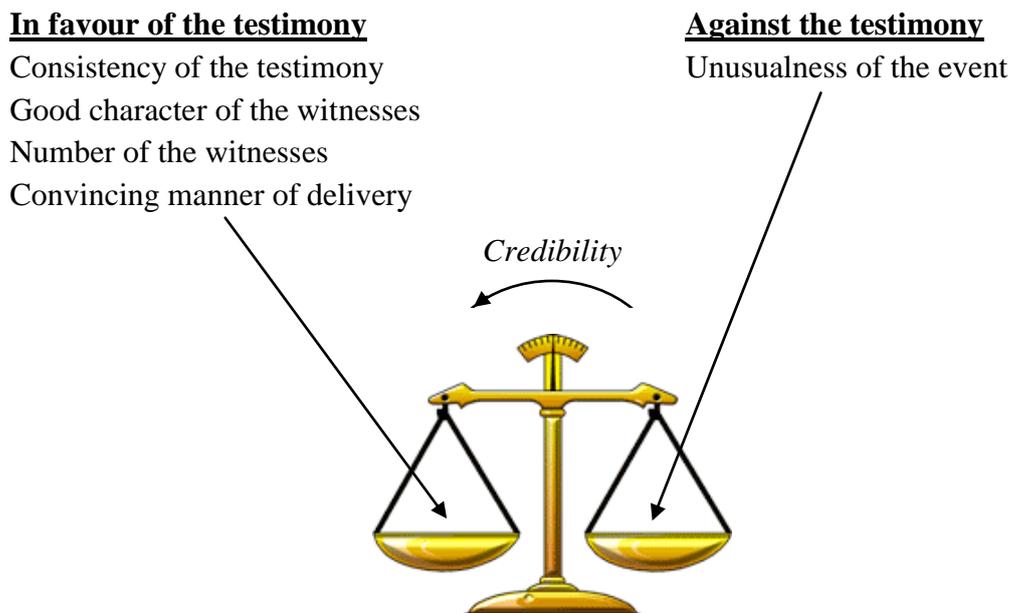
Here the unusualness of the reported event is identified as one additional factor that bears on the credibility of testimonial reports. But Hume then immediately isolates this particular factor, and views it as balanced *on the other side of the scale* against the characteristics of the testimony that

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[8] Moreover the first sentence of *E* 10.5, quoted above, suggests that he agrees. Note also his comment at *E* 10.28 that "some human testimony has the utmost force and authority in some cases".

incline us to believe it. He soon goes on to present the most extreme possible case of such "counterpoize" (*E* 10.8), where the reported fact

> instead of being only marvellous, is really miraculous; and … *the testimony, considered apart and in itself*, amounts to an entire proof; in that case, there is proof against proof, of which the strongest must prevail, but still with a diminution of its force, in proportion to that of its antagonist. (*E* 10.11; my emphasis).

Two very important points should be noted here. First, Hume's argument so far has treated a miracle as just an extreme case of an extraordinary event, and the general principles involved in this treatment are no different from those that he applies to any other extraordinary event. Secondly, in sketching out how the counterpoise takes place, Hume has understood the strength of the testimony – "considered apart and in itself" – as yielding a single overall measure of *proof* which can then appropriately be weighed against the strength of the counter-proof that arises from the unusualness of the alleged event. The stronger of these two proofs "must prevail, but still with a diminution of its force, in proportion to that of its antagonist". So the confidence we place in the testimony (or – depending on which way the scales point – in the inductive evidence against the supposed event) will depend on the extent to which the testimonial proof (or alternatively the proof from experience) over-balances its antagonist. The picture that results is something like this:

In favour of the testimony
Consistency of the testimony
Good character of the witnesses
Number of the witnesses
Convincing manner of delivery

Against the testimony
Unusualness of the event

Credibility

Thus the *overall* credibility depends on this contest between _the proof constituted by the inductive evidence in favour of the testimony "considered apart and in itself"_ (weighing down on the left-hand tray) and _the proof constituted by the uniform evidence of nature against the reported event_ (weighing down on the right-hand tray). We have "proof against proof", with the overall credibility given not by either "proof" individually, but by the result of weighing them against

each other.[9] In the setup illustrated above, this will be indicated by the direction of the pointer at the top of the scales once they have settled.

6. Does it make sense to weigh "entire proofs" against each other?

All this should seem fairly commonsensical, as long as we are careful to remember that Hume is using the term "proof" in the technical sense explained in §2 above. In this sense, even an "entire proof" can – without contradiction – be outweighed by another proof that is stronger, a point that he explains further in the 1761 letter to Blair:

> The proof against a miracle, as it is founded on invariable experience, is of that *species* or *kind* of proof, which is full and certain when taken alone, because it implies no doubt, as is the case with all probabilities; but there are degrees of this species, and when a weaker proof is opposed to a stronger, it is overcome. (*HL* i 350; Hume 1748, p. 165)

Hume does not spell out in detail how the strength of a "proof" is to be assessed, but much of what he says – both in the *Enquiry* (e.g. *E* 6.4, 10.4) and in the *Treatise* (e.g. *T* 1.3.11.5, 1.3.12.15) – suggests a model based rather crudely on numbers of instances. Suppose I experience an *A* which is *B*, then another, then yet another, and so on. "The first instance has little or no force: The second makes some addition to it: The third becomes still more sensible [i.e. noticeable]; and 'tis by these slow steps, that our judgment arrives at a full assurance" (*T* 1.3.12.2). If this pattern continues, and every *A* that I encounter is a *B*, then eventually my consistent experience will constitute an "entire proof", enabling me to go on inferring with complete confidence that each subsequent *A* will be a *B* also. But the "gradation from probabilities to proofs is in many cases insensible", and there seems to be no clear line where the one changes into the other.[10]

Perhaps this absence of a clear line between "probability" and "proof" is unimportant, given that Hume's notion of proof itself involves – as we have seen – a flexible rather than absolute standard. In line with his letter to Blair, it seems appropriate to interpret a "proof" as involving experiential evidence so strong that, were it standing alone without any countervailing evidence on the other side, it would suffice to give a reasonable person "full assurance" without any element of doubt. There are plenty of everyday cases where we feel such assurance (e.g. my

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[9] This point is very clear from Hume's text, and refutes outright the interpretation of John Earman (2000, p. 41; 2002, p. 97), which would instead involve a calculation, *prior* to the weighing operation, of two overall judgements – namely the conditional probability (given the testimony) of the event, and of its absence – which are then put in the balance against each other. For more on Earman, see Millican (2003) and cf. also Millican 2007a, pp. 170-1 n. 9.

[10] *Treatise* 1.3.12.2 suggests that the line will be crossed at the point when "our judgment arrives at a full assurance", a psychological rather than normative criterion. But it seems quite plausible that "full assurance" should eventually become normatively appropriate given sufficient accumulation of evidence, especially given our practical incapacity for reliably assessing, or reasoning in terms of, tiny probabilities (e.g. it does not seem feasible to maintain a psychological doubt corresponding accurately to a probability of one in a thousand, let alone one in a million).

confidence that the Hertford College "Bridge of Sighs" did not rotate in the air last night), but this need not involve a denial of *any possibility* of error.[11] I can recognise that Descartes' evil demon, a mischievous wizard, or divine action are all *epistemological possibilities*, but that alone will not lead me to harbour any doubts about the Bridge of Sighs' nocturnal movements. However I could perhaps *imagine* testimonial evidence so strong as to dent this complete confidence, and if such were to come my way, I would be faced with the sort of contest of "proofs" that Hume envisages. So far, therefore, his position seems to make reasonable sense.

7. How should Hume's Maxim be interpreted in probabilistic terms?

Just two paragraphs after explaining his balancing of proofs, Hume reaches the famous Maxim which is the culmination of Section 10 Part 1:[12]

Hume's Maxim

The plain consequence is (and it is a general maxim worthy of our attention), "That 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 …" (E 10.13)

One might think that evidence "sufficient to *establish*" some event would need to prove it beyond reasonable doubt, but it seems clear from the context that Hume is requiring only that it should render the event *more probable than not*:

When any one tells me, that he saw a dead man restored to life, I immediately consider with myself, *whether it be more probable*, that this person should either deceive or be deceived, or that the fact, which he relates, should really have happened. *I weigh the one miracle against the other,* and according to the superiority, which I discover, I pronounce my decision, *and always reject the greater miracle.* If the falsehood of his testimony would be more miraculous, than

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[11] Nor does Hume treat it as effectively conferring an error probability of "flatly zero", as claimed by Earman (2000, p. 23; cf. 2002, p. 95), which would beg the question against any miracle report by ruling out from the start any possibility of testimony outweighing such a proof. Fogelin (2003, pp. 43-53) rightly attacks this claim.

[12] Here, for simplicity, I am considering "Hume's Maxim" as being only the first part of the relevant sentence, which continues: "… 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." For a discussion of this second part, see Millican (2003) §7. In brief, Hume's talk of the "mutual destruction of arguments" (in a situation where the testimony's falsehood is even less likely than the miraculous event) can be given a clear and coherent mathematical interpretation, in terms of an inductive "credibility" measure which varies between 1 and -1, and whose value is typically assessed (in line with the inductive "straight rule") by the balance of positive over negative instances divided by the total number of instances, i.e. $(p-n)/(p+n)$. Such an interpretation is suggested by T 1.3.11.9-13, and this same measure can be applied in the case of convincing testimony for miracles by treating p as the initial probability of the miraculous event (e.g. 3 in a billion) and n as the initial probability of the testimony's falsehood (e.g. 1 in a billion). This then gives a very good approximation to the probability suggested by the mathematics of §8 (and note 16) below, translating from credibility (0.5 in this case) to conventional probability (0.75) using the formula $P = \frac{1}{2}(C+1)$.

the event which he relates; *then, and not till then, can he pretend to command my belief or opinion.* (*E* 10.13, my emphasis)

The first two sentences here assume an unsurprising inverse relationship between degrees of probability and of miraculousness. And only in the case of an exact tie, it seems, will Hume fail to "pronounce his decision" in favour of the more probable event (thus rejecting the greater miracle). Hence if the testimony's falsehood is more improbable than the supposedly miraculous event – even by a tiny fraction – "*then … can [the testifier] pretend to command my belief or opinion*".[13]

Bearing these points in mind, Hume's Maxim can be translated into probabilistic terms as follows:

> It is a general maxim … "That no testimony is sufficient to render a miracle more probable than not, unless the testimony be of such a kind, that its falsehood would be even less probable, than the fact, which it endeavours to establish …" (adapted from *E* 10.13)

Its intended basis is clear, because Hume's discussion sets up a trial of strength between the human testimony and the inductive "testimony of experience" (concerning what happens in nature, independently of the testimony). The testimony we are considering in the crucial case is exceptionally strong, of a type whose typical probability of falsehood f is tiny. But here this exceptional kind of testimony has been presented in favour of an event of a type M whose expected probability of occurrence m is also tiny. Nevertheless the testimony for M has been presented, so we have "proof against proof", and one of these tiny probabilities must be actualised. Either M genuinely occurred, in which case the human testimony is true and the inductive testimony of experience is "false", or alternatively M did not occur, in which case the human testimony is false and the inductive testimony of experience is "true". Understood in this way, the overall credibility of the miracle report indeed seems to reduce to a straightforward comparison of strength between the human testimony and the testimony of experience. Hume's derivation of his Maxim accordingly seems very straightforward, concluding that we should believe the testimony only if f (the probability of such testimony's being false) is even less than m (the probability of such an event's occurring).

8. Can Hume's Maxim be derived mathematically?

All this might seem to justify Hume's Maxim, but there is a key assumption underlying his argument, to which I have already drawn attention in §5 above (and clearly presupposed by his talk of the testimony "considered apart and in itself", and "testimony … of such a kind …"):

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[13] This suggests that Hume intends his Maxim as both a necessary *and* sufficient condition for credibility of miracle stories, though his initial wording implies only a necessary condition. In what follows, I ignore this complication.

Hume's Independence Assumption

Different "kinds" of testimony (specified in terms of the character and number of the witnesses, their consistency and manner of delivery etc.) carry a different typical probability of truth and falsehood *independently of the event reported*.

To see the importance of this assumption, suppose instead that it were not possible to identify "kinds" of testimony with their own typical probability of truth and falsehood. In that case, when speaking of "the probability of the testimony" we could only be referring properly to the probability of a *particular item* of testimony (i.e. a "token" rather than a "type"),[14] which asserts the occurrence of one *particular event*, and since that item of testimony would be true if, and only if, the event truly occurred, this would make it impossible to distinguish between *the probability of the testimony* and *the probability of the event*. Hume's Maxim would then become trivial.[15]

If, on the other hand, we adopt the Independence Assumption, then the Maxim can be derived very plausibly. To see this, let us as before focus on a particular kind of testimony – whose typical probability of falsehood is f – which on some occasion either asserts, or denies, the occurrence of a particular type of event M – whose probability of occurrence is m. If the reliability of that kind of testimony is probabilistically independent of what is being reported, then we can apparently calculate the probability of a "true positive" and a "false positive" report as follows:

True positive (miracle occurs, and is truly reported)

$$Pr(M \ \& \ t(M)) \ = \ Pr(M) \times Pr(\textit{true report}) \ = \ m.(1\text{-}f)$$

False positive (miracle does not occur, but is falsely reported as having occurred)

$$Pr(\neg M \ \& \ t(M)) \ = \ Pr(\neg M) \times Pr(\textit{false report}) \ = \ (1\text{-}m).f$$

If positive testimony has been given, therefore, this testimony will be probably true only if a "false positive" is less likely than a "true positive", and hence in accordance with the formula:

$$Pr(M/t(M)) > 0.5 \ \rightarrow \ (1-m).f < m.(1-f)$$

which simplifies to:

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[14] Those who have tried to understand Hume's Maxim in probabilistic terms have generally overlooked this crucial distinction between a "type" and a "token" interpretation (as introduced in Millican 1993, pp. 490, 495 n. 8). In Millican (2003) I argue in detail against the interpretations of Earman (2000, 2002), Gillies (1991), Holder (1998), Howson (2000), and Sobel (1991), though it now seems to me that *any* such "token" interpretation is bound to be hopeless for the simple reason given here, so detailed discussion of the mathematics is superfluous.

[15] As critics from George Campbell (1762, I §6, pp. 99-103) to John Earman (2000, p. 41; 2002, p. 97) have alleged. But this is certainly a misinterpretation, as pointed out in §5 above (cf. especially note 9).

$$\Pr(M/t(M)) > 0.5 \;\;\rightarrow\;\; f < m\,.$$

This result neatly corresponds to Hume's Maxim, since its right-hand side is exactly equivalent to saying that *the falsehood of the testimony, considered apart and in itself* is more miraculous (i.e. less probable) than *the event reported, considered independently of the testimony*.[16]

9. Is Hume's Maxim of practical value?

If his Independence Assumption legitimately applies to testimony for miracles in this way (for doubts, see §19 below), then Hume's Maxim does indeed provide an appropriate "check" (*E* 10.2) on human credulity. To illustrate how such a restraining mechanism can work in practice, let us consider a non-miraculous example. Suppose, then, that I want to know whether I suffer from some genetic condition *G* which afflicts one person in a million. I have no evidence either way, but a test is available which seems very reliable, in that whoever is tested, and *whether they actually have the condition or not*, the chance that the test will give a correct diagnosis is 99·9%, and an incorrect diagnosis only 0·1% (so Hume's Independence Assumption applies). When I later leave the clinic in distress at having tested positive for *G*, how convinced should I be that I do indeed have that condition?

Repeated experience with audiences of undergraduates and others indicates that most people would judge my likelihood of having *G* in this situation to be very high, but in fact the reverse is the case, as Hume would recognise. As I stumble out despondently through the clinic door, he might greet me with a consoling comment something like this:

> *Consider whether it be more probable, that this kind of test should be mistaken, or that you should really have condition G.*[17] (cf. *E* 10.13)

Given that the test is wrong one time in a thousand, while *G* afflicts only one person in a million, there is clearly a far greater likelihood of a mistaken test than of my actually suffering from *G*. And so a positive test does relatively little to indicate that I actually have the disease: in fact, it changes the probability from a negligible one in a million to the only slightly more worrying one

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[16] Moreover the mathematical argument here can be seen as a more precise version of the informal reasoning in the final paragraph of §7 above, which spells out what seems likely to have been Hume's own route to his Maxim. As explained in Millican (2003) §4, the value for $\Pr(M/t(M))$ implied by this reasoning is given by the formula $m(1-f)\big/\big(m(1-f) + f(1-m)\big)$.

[17] Note that this is quite different from asking: "Which is more probable, in the light of this result: that this specific test is mistaken in saying that you have condition *G*, or that you really have condition *G*?", which would be trivially equivalent to asking whether the test result makes it more probable than not that I have the condition. Earman's interpretation (cf. note 9 above) would imply that Hume's Maxim expresses just this useless trivial equivalence.

in 1,002.[18] Hume's Maxim, therefore, is entirely correct in this case, and it also gives the correct answer for other relevantly similar cases: if, for example, we change the "initial probability" of the disease to less than one in a thousand, then the test indeed becomes credible.

10. Does Hume consider a miracle to be a contradiction in terms?

The discussion above has made little mention of *miracles* as such, but has focused quite generally on the assessment of testimony for events that seem improbable based on past experience. In §7 we saw how Hume's famous Maxim could be derived entirely on this basis, by closely following his own text and taking advantage of an equivalence between "more miraculous" and "less probable" which he himself implicitly endorses. So far, then, it seems that miracles play a role in his main argument only as extreme instances of initially improbable events.[19]

If we confine our attention to the main argument of *Enquiry* 10 Part 1, this impression is indeed entirely correct. Miracles feature significantly only in the famous paragraph 12, which I deliberately ignored at the beginning of §7 above, precisely in order to make this point:

> A miracle is a violation of the laws of nature; and as a firm and unalterable experience has established these laws, the proof against a miracle, from the very nature of the fact, is as entire as any argument from experience can possibly be imagined. … Nothing is esteemed a miracle, if it ever happen in the common course of nature. It is no miracle that a man, seemingly in good health, should die on a sudden: because such a kind of death … has … been frequently observed to happen. But it is a miracle, that a dead man should come to life; because that has never been observed, in any age or country. There must, therefore, be a uniform experience against every miraculous event, otherwise the event would not merit that appellation. And as an uniform experience amounts to a proof, there is here a direct and full *proof*, from the nature of the fact, against the existence of any miracle; nor can such a proof be destroyed, or the miracle rendered credible, but by an opposite proof, which is superior. (*E* 10.12)

The entire thrust of this paragraph is to urge, on the basis of what a miracle is understood to be, that any miracle must *ipso facto* be an extreme case of an extraordinary event: an event against

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[18] Consider a population of a billion, of whom one thousand have the disease while 999,999,000 do not. If all were tested, we would expect 999 true positives against 999,999 false positives.

[19] In a long footnote (*E* 10.10 n. 22) discussing his Indian prince example, Hume sketches a distinction between *extraordinary* and *miraculous* events, on the basis that the latter are *contrary* to past experience while the former are merely *not conformable* to it. It is debatable how far he manages to make good this distinction – for example Campbell (1762 I §2, pp. 47-59), Burns (1981, pp. 166-9, 224-30), and Coady (1992, chapter 10) forcefully attack it, while Coleman (2001) and Garrett (2002, pp. 321-3) attempt a defence. If Hume were concerned to treat miracles quite differently from extraordinary events, by ruling them out in principle either logically (cf. Norton below) or epistemologically (cf. §12 below), then the distinction would be crucial in defending him from the accusation of unjustified dogmatism against unfamiliar events. But if I am correct in maintaining that Hume's principles are the same as applied to both categories, then very little hangs on it. (And it does seem to have been an afterthought: the Indian prince paragraph was added in the 1750 second edition, and the footnote only while that edition was going through the press. For discussion of some of the intellectual context, see Wootton 1990, pp. 194-7.)

which there is a strong *proof* from experience. Hence Hume's argument concerning reports of extraordinary events – already virtually completed before this paragraph starts, and culminating in his Maxim immediately after it – will automatically apply to any reported miracle story.

Some interpreters, however, have been misled by this paragraph to see Hume as proposing an entirely different kind of argument, based on the *concept* of a miracle:

> A miracle is a violation of the laws of nature; a law of nature is established by a firm and unalterable experience. The champion of miracles is arguing, however, that this experience is not firm and unalterable; at least one exception is, he claims, known. From this exception it follows, Hume reminds us, that there is no violation of a law of nature because there is no law of nature, and hence, there is no miracle. (Norton 1982, p. 299; cf. Wilson 1989, p. 260)

However this sort of reading – which interprets Hume's argument as demonstrative in force – cannot possibly be right, for at least two reasons. First, it would imply that his aim is not so much to undermine the evidence *for the very occurrence* of a given reported extraordinary event, but rather to deny that the event, *if it occurred, was a genuine miracle*. Hume, however, says nothing on the latter point, and the argumentative move that Norton describes in the quotation above, whereby he is supposed to countenance the possibility that *M* did occur after all, albeit non-miraculously, simply doesn't appear in the text here. The second and even more decisive objection to this sort of reading is that it makes a nonsense of Hume's situating his argument so firmly within the context of his treatment of probability. No account of his essay that pays significant attention to the earlier paragraphs can with any plausibility present it as turning on a contradiction in terms.[20] Indeed paragraph 12 itself makes clear that Hume takes "the proof against a miracle" to be an "argument from experience" rather than a priori, and potentially defeasible by "an opposite proof" rather than demonstrative.

11. *What does Hume mean by a "law of nature"?*

Hume famously characterises a miracle as an event that violates or transgresses a "law of nature" (by the agency of the Deity or some invisible agent).[21] But if – as is commonly assumed – he conceives of a "law of nature" as being a *true* universal generalisation about how things behave,

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[20] In Part 2 Hume does sometimes describe miracles as impossible, but then he means physical or causal rather than conceptual or logical impossibility – see §15 below.

[21] I call Hume's statement that "A miracle is a violation of the laws of nature" (*E* 20.12) a *characterisation* rather than a *definition*, because his full definition follows in a footnote attached to the very end of the paragraph: "A miracle may be accurately defined, *a transgression of a law of nature by a particular volition of the Deity, or by the interposition of some invisible agent*. A miracle may either be discoverable by men or not. … The raising of a house or ship into the air is a visible miracle. The raising of a feather, when the wind wants ever so little of a force requisite for that purpose, is as real a miracle, though not so sensible with regard to us." (*E* 10.12 n. 23).

then a miracle so characterised would be, after all, a contradiction in terms, notwithstanding §10 above. In fact most of his uses of the term refer to *moral* "laws of nature", following in the tradition of Grotius, Pufendorf, and Locke. The *Enquiry* is Hume's earliest work to refer to *physical* "laws of nature", with most such references in Section 10 itself,[22] but nowhere does he spell out exactly what he takes such a law of nature to be. I suspect that the common assumption described above – that he can only have in mind a *de facto* exceptionless generalisation – is largely based on confusions about his theory of causation, which is supposed by many to imply that there is no such thing as a causal law beyond "a summation of a wholly uniform past experience" (Norton 1982, p. 298; cf. Wilson 1989, p. 259). This common view is mistaken, and Hume is entirely comfortable with causal science (including the notions of hidden causes and functional relationships between forces etc.),[23] so there is no obvious reason why he should have significantly more difficulty making sense of the concept of a miracle than other thinkers who have tried to explicate this delicate notion. The general idea, familiar at least since Aquinas (e.g. *Summa Contra Gentiles*, 3.101.1-2), is that of an intrusion into the natural order, whereby supernatural agency brings about some event that would not – and typically *could* not – have occurred in the ordinary course of things.[24] This presupposes that there is some set of default "laws" that determine how things behave in the absence of special supernatural intervention. And although filling this out in detail could be problematic, such problems belong more to the theist who appeals to miracles "to be the foundation of a system of religion" (*E* 10.36) than to his sceptical critic. Hume himself never suggests that the concept of miracle is incoherent, but if it turned out to be so, that would merely provide additional ammunition in his overall attack on the case for theism.

Hume's argument requires no more than a relatively vague interpretation of a "law of nature", as a description of behaviour which has virtually always – but maybe not universally – been observed in nature. Sometimes he uses the term in just this way, as for example its one occurrence in *The Natural History of Religion*, where he remarks on a "uniform law of nature" to which "few exceptions are found" (*NHR* 15.3). There are also plenty of other places where he seems to use "uniform" to signify something less than strict universality.[25] This casts a softer light on his frequently attacked assertion that "There must … be a uniform experience against every

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[22] The full catalogue of relevant paragraphs is *E* 4.9, 8.4, 8.14, 10.12, 10.12 n. 23, 10.31, 35, 37, and 38.

[23] This is not to imply that relevant philosophical difficulties cannot be raised for his position. For the interpretation of Hume on causal science, see Millican (2007b) pp. 232-3 and (2009) §1. For the view that he is limited to an inadequate conception of a law of nature, see for example Flew 1961, pp. 204-6 and Gaskin 1988, pp. 160-2.

[24] Mackie (1982, pp. 19-23) gives a lucid defence and discussion of this general idea of a miracle.

[25] See for example *T* 2.3.1.4, *M* 5.45, "Of National Characters" paras 6, 18, 19, 20 n. 10 (*Essays*, pp. 199, 206, 207, 208), "Of the Standard of Taste" para. 17 (*Essays*, p. 237), *NHR* 6.2.

miraculous event" (*E* 10.12). Many of Hume's critics (e.g. Lewis 1947, pp. 105-6; Purtill 1978, pp. 191-2; Johnson 1999, pp. 18-19) have seen this as crudely begging the question by taking for granted that no miraculous event has ever actually taken place. Others (e.g. Broad 1917, pp. 85-6; Gaskin 1988, pp. 159-60) have understood him to be assuming that an event can count as miraculous only if it reaches the absolute limit of improbability, as an entirely one-off violation of an otherwise strictly universal "law". In response to such criticisms, Garrett (2002, p. 320) rightly points out that the epistemological focus of Hume's discussion implies a *subjective* notion of a law of nature (i.e. relative to the experience of the observer) rather than *absolute* (i.e. descriptive of what actually occurs, whether observed or not). As remarked in §10, Hume's interest is consistently in whether a particular event *actually happened*, not whether the event *would have been contrary to (unknown) natural laws*. And although a subjective understanding of a "law of nature" may run counter to most modern usage, it was certainly available in Hume's day (e.g. Sherlock 1729, p. 61). In this sense, someone yet to be convinced that anyone has ever been resurrected from the dead has (subjective) "uniform experience" for the "law of nature" that such events do not occur, but this does not logically rule out that a resurrection has (objectively) occurred *beyond* their experience. Nor does it imply that resurrections would cease to count as miraculous if they were repeated, as, for example, in the Gospel accounts of Lazarus and Jesus. Hume's own "accurate" definition of a miracle is clearly compatible with repeated violations of a natural law, as confirmed by the following passage which immediately precedes it:

> … if a person, claiming a divine authority, … should order *many* natural events, which immediately follow upon his command; these might justly be esteemed miracles, because … nothing can be more contrary to nature than that the voice or command of a man should have such an influence. (*E* 10.12 n. 23, my emphasis).

There is also an indication, near the end of the essay, that Hume intends his argument to apply not only to overtly religious claims, but also to "every thing new, rare, and extraordinary in nature … that is to be found in the writers of natural magic or alchemy, or such authors, who seem, all of them, to have an unconquerable appetite for falsehood and fable" (*E* 10.39, quoting Francis Bacon). Were Hume alive today, he would no doubt include within this category many modern "New Age" claims, for example those associated with alternative therapies such as homeopathy whose alleged mode of operation seems to run wildly at odds with our established scientific understanding of the world. Such therapies characteristically claim to involve reliably repeatable phenomena, and yet Hume's argument can apply to them just as effectively as to the more typically one-off miraculous claims of religion (cf. n. 39 in §18 below).

12. Is Part 2 of the essay redundant?

Hume's main argument in Part 1 of the essay is commonly called his "a priori" argument concerning miracles, because it is based on general principles rather than the specific characteristics of actual historical testimony. Part 2 starts from four "a posteriori" arguments, drawing attention to the weakness, remoteness, and inconsistency of such testimony, and our tendency to be too easily seduced by it. Overtly, the Maxim with which Part 1 concludes appears to set a genuine threshold for credibility which is then addressed by the Part 2 arguments. But some scholars have instead read Part 1 is intended by itself to establish the incredibility of miracles, either by ruling out their very possibility (a reading rejected in §10 above), or more plausibly, by ruling out the possibility of testimony sufficient to establish a miracle.

This reading, which Burns calls the "classical" interpretation (1981, p. 143), seems to have been widely taken for granted until challenged by Antony Flew.[26] It is suggested by the statement in paragraph 12 that "the proof against a miracle, from the very nature of the fact, is as entire as any argument from experience can possibly be imagined". For if the proof against a miracle is as strong as "any argument from experience [that] can possibly be imagined", then presumably no argument from experience could possibly outweigh it. And such impossibility would then neatly explain Hume's apparently rather dogmatic denials of miraculous testimony in Part 2 (which we shall come to in §14, §15 and §17 below).[27]

On the other side, however, there are plenty of indications in the final text of the essay that Hume did not intend this extreme position. In Part 1, he supposes "that the testimony, considered apart and in itself, amounts to an entire proof [so] there is proof against proof" (*E* 10.11), and he goes on to consider what would follow were "the proof against a miracle" to "be destroyed … by an opposite proof, which is superior" (*E* 10.12).[28] Likewise the second part of his Maxim ("And even in that case …") is entirely focused on this eventuality (*E* 10.13). Part 2 starts by saying:

> In the foregoing reasoning we have supposed, that the testimony upon which a miracle is founded, may possibly amount to an entire proof … But it is easy to shew … that there never was a miraculous event established on so full an evidence. (*E* 10.14)

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[26] See Flew (1959, pp. 2-5, 12-14; 1961, p. 176), and cf. Gaskin 1988, 153-4. Broad (1917) p. 94 exemplifies the earlier orthodoxy, while Burns (1981) pp. 142-58 gives the most sustained opposition to Flew's reading.

[27] According to Burns, "scattered throughout the exposition of the four a posteriori arguments are a number of asides which can reasonably be interpreted only as out-of-context references to the a priori argument understood according to the classical interpretation", and he goes on to cite *E* 10.16, 22, 25, 26 and 27 (1981, p. 152).

[28] This last passage occurs within *the very same paragraph* in which Hume has just stated that "the proof against a miracle … is as entire as any argument from experience can possibly be imagined". So that statement has to be understood as less absolute that it initially appears, perhaps along the lines of his reference to a "*species* or *kind* of proof, which is full and certain when taken alone" but which yet admits of degrees (cf. §6 above).

This does not give the impression that Part 1 has already settled the question. Later in Part 2, Hume states explicitly that, outside a religious context, "there may possibly be miracles, or violations of the usual course of nature, of such a kind as to admit of proof from human testimony" (*E* 10.36), and he gives an example of eight days of darkness across the world, witnessed worldwide and reported by travellers. Campbell – who presumed that Part 1 was intended to be decisive by itself – evidently thought this example quite contrary to that aim, devoting Section III of his *Dissertation*, entitled "*Mr Hume himself gives up his favourite argument*", to highlighting the inconsistency. But in his 1761 letter to Hugh Blair, Hume responded:

> Sect. III. There is no contradiction in saying, that all the testimony which ever was really given for any miracle, or ever will be given, is a subject of derision; and yet forming a fiction or supposition of a testimony for a particular miracle, which might not only merit attention, but amount to a full proof of it. For instance, the absence of the sun during 48 hours; but reasonable men would only conclude from this fact, that the machine of the globe was disordered during the time. (*HL* i 349-50; Hume 1748, p. 165)

Hume denies any contradiction, and implies that he is deliberately leaving open the possibility of "testimony for a particularly miracle, which might … amount to a full proof of it".[29]

I conclude, therefore, that we should understand Hume's "a priori" argument as intended to do exactly what the text says: namely, to erect a theoretical hurdle that testimony for a miracle could *in principle* overcome, exactly in line with his general probabilistic framework (which, as we saw in §§5-7 above, leads very naturally to his Maxim). This then leaves a clear role for his subsequent "a posteriori" arguments – namely, to emphasise the extreme unlikelihood of any such testimony ever achieving this hurdle in practice – and thus avoids the unpalatable assessment of them as philosophically gratuitous. But a nagging question might remain, given Hume's apparent shift of perspective from that of the "wise man" of the beginning of Part 1, who carefully weighs the relevant evidence (*E* 10.4), to that of the "wise", "judicious" and "learned" of Part 2, who treat any miracle story with scorn (*E* 10.21) and who "are contented … to deride its absurdity" without serious consideration (*E* 10.22). We shall return to this question in §17 below.

13. *How does Hume explain the propagation of miracle stories?*

Having erected an appropriate threshold of credibility by means of his Maxim, Hume moves on in Part 2 to argue that no actual testimony for a miracle has ever got close to reaching that threshold. While doing so, he also indirectly suggests his own explanation of how such false testimony could

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[29] Here I disagree with Burns, who says that "no repudiation of the classical interpretation is attempted in any of the points raised against Campbell" (1981, p. 153), and does not mention this passage.

have propagated. His first "a posteriori" argument economically packs a wide range of points into a single sentence:

> For *first*, there is not to be found, in all history, any miracle attested by a sufficient number of men, of such unquestioned good-sense, education, and learning, as to secure us against all delusion in themselves; of such undoubted integrity, as to place them beyond all suspicion of any design to deceive others; of such credit and reputation in the eyes of mankind, as to have a great deal to lose in case of their being detected in any falsehood; and at the same time, attesting facts, performed in such a public manner, and in so celebrated a part of the world, as to render the detection unavoidable (*E* 10.15)

These points are later augmented by Hume's third argument, which follows a few paragraphs later:

> *Thirdly*. It forms a strong presumption against all supernatural and miraculous relations, that they are observed chiefly to abound among ignorant and barbarous nations; or if a civilized people has ever given admission to any of them, that people will be found to have received them from ignorant and barbarous ancestors … When we peruse the first histories of all nations, we are apt to imagine ourselves transported into some new world; … Prodigies, omens, oracles, judgments, quite obscure the few natural events … (*E* 10.20)

Hume's explanation of this phenomenon – whereby miraculous stories "grow thinner every page, in proportion as we advance nearer the enlightened ages" (*E* 10.20) – is not that human nature has changed: "it is nothing strange … that men should lie in all ages" or that "marvellous relations" should be started by those with vivid imaginations (*E* 10.21). But in educated societies, such stories are "treated with scorn by all the wise and judicious" and "at last … abandoned even by the vulgar", whereas those "sown in a more proper soil" – of a culture of superstition and ignorance – are allowed to grow unchecked (*E* 10.20). It follows that the stories that become prominent tend to originate from ancient, remote and uneducated parts of the world.

Hume's second argument complements these others, by providing an explanation of why miracle stories are so popular in the absence of critical scrutiny:

> *Secondly*. … The passion of *surprize* and *wonder*, arising from miracles, being an agreeable emotion, gives a sensible tendency towards the belief of those events … But if the spirit of religion join itself to the love of wonder, there is an end of common sense; and human testimony, in these circumstances, loses all pretensions to authority. A religionist may be an enthusiast, and imagine he sees what has no reality: He may know his narrative to be false, and yet persevere in it, with the best intentions in the world, for the sake of promoting so holy a cause … The many instances of forged miracles … which, in all ages, have either been detected by contrary evidence, or which detect themselves by their absurdity, prove sufficiently the strong propensity of mankind to the extraordinary and the marvellous … (*E* 10.16-19)

Hume might also usefully have added here some discussion from his *Natural History of Religion*, concerning humans' tendency to ascribe events to gods and spirits, which also helps to explain both why supernatural miracle stories seem so plausible to uneducated cultures, and why by contrast the progress of science tends to undermine them:

… We hang in perpetual suspence between life and death, health and sickness, plenty and want; which are distributed amongst the human species by secret and unknown causes … These *unknown causes*, then, become the constant object of our hope and fear … Could men anatomize nature, … they would find, that these causes are nothing but the particular fabric and structure of the minute parts of their own bodies and of external objects; and that, by a regular and constant machinery, all the events are produced, about which they are so much concerned. But … the ignorant multitudes … can only conceive the *unknown causes* in a general and confused manner …

There is an universal tendency among mankind to conceive all beings like themselves … We find human faces in the moon, armies in the clouds; and by a natural propensity, if not corrected by experience and reflection, ascribe malice or good-will to every thing, that hurts or pleases us. … No wonder, then, that mankind, being placed in such an absolute ignorance of causes, and … at the same time so anxious concerning their future fortune, should immediately acknowledge a dependence on invisible powers, possessed of sentiment and intelligence. …

In proportion as any man's course of life is governed by accident, we always find, that he encreases in superstition … All human life, especially before the institution of order and good government, being subject to fortuitous accidents; it is natural, that superstition should prevail every where in barbarous ages … (*NHR* 2.5-3.3)

Obviously any such explanation of the origins of religion is to some extent speculative, but Hume's account seems generally plausible.[30] And that humanity has a love of "surprize and wonder" is evident enough: the propagation of "urban myths", conspiracy theories, paranormal and miracle cures, monster and alien sightings etc. over the Web and the more sensational media demonstrates sufficiently that this passion is still widespread today.

14. What is going on in Hume's "contrary miracles" discussion?

Hume's fourth "a posteriori" argument is less straightforward and convincing than the other three, though it provides him with a pretext for introducing material which is highly effective in his debate with Christian believers:

I may add as a *fourth* reason … that, in matters of religion, whatever is different is contrary; and that it is impossible the religions of ancient ROME, of TURKEY, of SIAM, and of CHINA should, all of them, be established on any solid foundation. Every miracle, therefore, pretended to have been wrought in any of these religions (and all of them abound in miracles), as its direct scope is to establish the particular system to which it is attributed; so has it the same force, though more indirectly, to overthrow every other system. In destroying a rival system, it likewise destroys the credit of those miracles, on which that system was established; so that all the prodigies of different religions are to be regarded as contrary facts, and the evidences of these prodigies, whether weak or strong, as opposite to each other. (*E* 10.24)

This argument, unlike the others, depends crucially on the idea that each miracle claim is being used to support a specific religious belief, from which Hume takes it to follow that where those

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[30] For an example of recent research confirming the tendency of both children and adults towards "promiscuous teleology", see Lombrozo *et al.* (2007), whose introduction also mentions a number of other relevant studies.

beliefs conflict, the miracle claims are in turn rendered indirectly contrary to each other. Unfortunately, however, this argument works only if the evidential relationships between each miracle story and its corresponding religion are demonstrative: Hume, uncharacteristically, is here failing to notice how differently things fall out if they are merely probabilistic. Starting from a default position of naturalism, for example, we might well consider that the genuine occurrence of a reported "Christian" miracle – by greatly raising the probability of supernatural agency (even more than it raises the probability of Christianity itself) – would thereby raise the probability *also* of a reported "Islamic" miracle, notwithstanding the conflict between the two religious systems. So Hume goes too far when arguing that miracles "pretended to have been wrought" in contrary religions are correspondingly "to be regarded as contrary facts".

Despite its logical flaws, Hume's "contrary miracles" argument retains significant *indirect* persuasive force, by challenging the believer to distinguish the credentials of his own preferred miracle stories from those he rejects. And this could explain why he goes on to cite several miraculous accounts that are relatively well attested, and which might therefore superficially seem to weaken, rather than strengthen, his overall case.[31] The point here may be not so much that his Christian readers are *logically compelled to deny* the miracles of rival religions (as the contrary miracles argument would suggest), but rather, that such believers *will in fact want to deny* them. This denial might be motivated simply by scepticism towards rival religious beliefs, but it might also reflect an awareness that insufficiently discriminating acceptance of the miraculous, by putting the Gospel miracles on a par with others, both undermines any special claims for Christianity and also casts doubt on the entire collection (especially when contemporary forged miracles are "detected by contrary evidence", *E* 10.19). Thus the would-be discriminating believer is put in a bind: keen to explain away the host of alien miracle stories as fraudulent or delusive (perhaps by appeal to the sorts of tendencies we saw Hume emphasising in §13 above), while denying that the stories he himself endorses (e.g. from the Gospels) can be undermined in the same way. Seen in this light, Hume's abrupt dismissal of the alleged miracles of Vespasian ("so gross and so palpable a falsehood", *E* 10.25) and Saragossa ("carried falsehood upon the very face of it", *E* 10.26) becomes much easier to understand. Rather than attempting to *argue* for such rejection, he may simply be reporting a view that he expects others to share, and tacitly inviting his discerning reader to notice the difficulties this implies.

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[31] Indeed Hume exaggerates the strength of the evidence for these cited miracles, as noticed by several of his early critics. See for example Campbell (1762) pp. 200-47 and Flew (1959) pp. 8-9.

15. How can Hume describe miracles as "absolutely impossible"?

Hume's dismissal of the Abbé Pâris miracles might seem less easy to condone:[32]

> Where shall we find such a number of circumstances, agreeing to the corroboration of one fact? And what have we to oppose to such a cloud of witnesses, but the absolute impossibility or miraculous nature of the events, which they relate? And this surely, in the eyes of all reasonable people, will alone be regarded as a sufficient refutation. (*E* 10.27)

He has often been criticised for this apparent dogmatism (e.g. Swinburne 1968, p. 323; Earman 2000, pp. 31-2), and accused of inconsistency in his talk of "the absolute impossibility ... of the events" (e.g. Gaskin 1988, pp. 161-4). Certainly he cannot consistently claim that these reported events are *conceptually or a priori* impossible (cf. *E* 12.29). But it is entirely consistent for him to claim that the supposed miracles are *causally* impossible, given the laws of nature that we have all learned from experience (and which, at this point in the discussion, he is taking to be generally agreed – hence there need be no dogmatism here). Some commentators (including Gaskin *op. cit.*) have seen even this as problematic, apparently owing to the common assumption that Hume denies any genuine causal modality. But as we noted in §11 above, he is very committed to causal explanation and causal science; moreover he repeatedly and explicitly insists that necessity is essential to causation (e.g. *T* 1.3.2.11, 1.3.6.3, 2.3.1.18, *E* 8.25, 8.27). It follows that he must acknowledge such causal necessity, and this automatically brings with it a cognate notion of possibility (applying to anything whose contrary is not causally necessary in that sense).[33] Hence we should not be at all surprised to find Hume describing would-be miracles as "impossible" or even "absolutely impossible", precisely because they would violate established causal laws.[34]

16. Why does Hume strengthen his Maxim against religious miracles?

Having rejected the supposedly well-attested stories that he expects his readers also to reject, Hume builds on his contrary miracles argument by itemising several other reasons for particularly

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[32] Note that the supposed miracles of Abbé Pâris, a Jansenist, would be rejected by the vast majority of Roman Catholic readers as well as Protestants.

[33] Hume denies causal necessity *as other philosophers attempt to conceive of it* (indeed he denies that they achieve any such conception). But to treat this as an unequivocal denial of causal necessity is rather like supposing that if I reject the *vital force* theory of life and hence deny having any such force within me, then I am implicitly claiming to be dead.

[34] Hume also uses "absolutely impossible" in a causal sense at *T* 1.1.1.10, 2.1.5.3, *E* 2.8. Note that this impossibility is *not* epistemological: Hume is not suggesting that the miracles are impossible in that "their existence is ruled out by a proof" (Garrett 2002, p. 326), but rather, that they are impossible *causally* given the way nature works. This is a claim about what the laws of nature are, with which he thinks his readers will agree and for which he has strong evidence (in the form of inductive proof), but he is not claiming infallibility – there is no *epistemological* impossibility of error.

doubting *religious* miracle stories. Some of these are strongly reminiscent of points made in his second "a posteriori" argument:

> what greater temptation than to appear a missionary, a prophet, an ambassador from heaven? … Or if, by the help of vanity and a heated imagination, a man has first made a convert of himself, … who ever scruples to make use of pious frauds, in support of so holy and meritorious a cause? … the gazing populace, receive greedily, without examination, whatever sooths superstition, and promotes wonder. … How many stories of this nature have, in all ages, been detected and exploded … ? Where such reports, therefore, fly about, the solution of the phaenomenon is obvious; and we judge in conformity to regular experience and observation, when we account for it by the known and natural principles of credulity and delusion. (*E* 10.29-31)

Here we see again hints of the line of thought implicit in the contrary miracles discussion, whereby all the countless religious miracle stories are lumped together as equally deserving of a common dismissive explanation. And Hume goes on to suggest that this particular human weakness with respect to *religious* miracle stories, and their appalling track record,[35] gives reason for strengthening his Maxim in their case:

> It is experience only, which gives authority to human testimony; and it is the same experience, which assures us of the laws of nature. When, therefore, these two kinds of experience are contrary, we have nothing to do but substract the one from the other, and embrace an opinion, either on one side or the other, with that assurance which arises from the remainder. But according to the principle here explained, this substraction, with regard to all popular religions, amounts to an entire annihilation;[36] and therefore *we may establish it as a maxim, that no human testimony can have such force as to prove a miracle, and make it a just foundation for any such system of religion.* (*E* 10.35, my emphasis)

Here Hume approaches an attitude of immediate dismissal towards such stories, an attitude which he clearly takes to be justified inductively.

17. Is Hume's dismissal of miracle stories overly dogmatic?

At several points in Part 2 of the essay, Hume suggests that any miracle report will be taken seriously only by "fools" and the "weak", and will be "treated with scorn by all the wise and judicious", who "are contented, in general, to deride its absurdity, without informing themselves of the particular facts, by which it may be distinctly refuted" (*E* 10.21-2). Later he says that the profusion of bogus religious miracle stories should be "sufficient, with all men of sense, not only

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[35] Again, notice that even the Christian reader can be expected here to acknowledge that there have been plenty of bogus miracle stories associated with *contrary* religions.

[36] Garrett (2002, p. 324 n. 25) interprets this as implying that "proofs entirely obviate, or 'annihilate', considerations of probability", so that a probability weighed against a proof will count as nothing. But when one army annihilates another, this does not imply that it sustains no losses itself, and likewise Hume's words here can perfectly well be understood as meaning simply that the proof will always win easily, leaving no *net* balance on the other side.

to make them reject" any such story, "but even reject it without farther examination"; he accordingly expresses a "general resolution, never to lend any attention" to such testimony (*E* 10.38). Is this just hyperbolic dogmatism, perhaps provoked by the ridiculous stories he has been considering, or can it be justified?

Hume makes some relevant points at *E* 10.32-34 – when discussing religious miracles – which are anticipated in his (largely invented) description of the attitude of Cardinal de Retz:

> He considered justly, that it was not requisite, in order to reject a fact of this nature, to be able accurately to disprove the testimony, and to trace its falsehood, through all the circumstances of knavery and credulity which produced it. He knew, that, as this was commonly altogether impossible at any small distance of time and place; so was it extremely difficult, even where one was immediately present, by reason of the bigotry, ignorance, cunning, and roguery of a great part of mankind. He therefore concluded, like a just reasoner, that such an evidence carried falsehood upon the very face of it, and that a miracle, supported by any human testimony, was more properly a subject of derision than of argument. (*E* 10.26)

This attitude might well seem reasonable when the origins of a story are shrouded in mystery, but can we justify dismissing a story without bothering to investigate it even when we have a genuine opportunity to do so? Challenged by George Campbell in Section IV of his *Dissertation*, Hume responded with a more interesting and general consideration:

> *Sect. IV.* Does a man of sense run after every silly tale of witches or hobgoblins or fairies, and canvass particularly the evidence? I never knew any one, that examined and deliberated about nonsense who did not believe it before the end of his inquiries. (*HL* i 350; Hume 1748, p. 165)

Interpreted as an answer to Campbell's complaint (rather than just a bald reassertion that no man of sense would give any time to such stories), Hume seems to be suggesting that all of us are prone to lose sound critical judgement if we get drawn too much into the particularities of specific tales. That being so, experience can teach us that sometimes it is rational *not* to rely on careful and detailed critical assessment, but instead to prefer the verdict of a general rule without giving the matter too much thought. A modern example might be the persuasive and polished advertising (for investments, prize draws, novel therapies, conspiracy theories etc.) that regularly bombards us, where reading the advertiser's seductive arguments is typically not only a waste of time, but worse, carries the danger of being persuaded. Hume is suggesting that this same attitude is appropriate to miracle stories: that this is a case where, counter-intuitively, it can often be *more* rational to give *less* detailed consideration!

18. Can divine teleology provide a response?

After expressing his strengthened maxim (quoted in §16 above), Hume gives three examples to illustrate his preference for secular over religious miracle stories. The first of these (*E* 10.36) is the imagined eight days of darkness in January 1600, as mentioned in §12 above; the second

(*E* 10.37) involves a reported resurrection of Queen Elizabeth I, also dated to 1600, and the third (*E* 10.38) is similar except that the resurrection is "ascribed to [a] new system of religion". However Hume's discussion of these examples is rather confusing, first because he suggests that the credibility of the universal darkness is due to its analogy with natural events (rather than to the absence of religious distortions), and secondly because his emphatic dismissal of the resurrection examples seems to be almost unaffected by the potential religious association – "the knavery and folly of men" provide an equally obvious explanation in both cases. The real contrast between the universal darkness and the resurrections, therefore, seems to lie not in anything to do with religion, but in the quality of the evidence (widespread and independent, as opposed to local and potentially colluding). So it is interesting to consider a modified example in which the relevant global celestial phenomenon is not eight days of darkness, but instead something transparently religious. Imagine, for example, a month-long appearance in 1600 of a new set of purple stars, spelling out across the sky the words "εγω ειμι η οδος και η αληθεια και η ζωη", New Testament Greek for "I am the way and the truth and the life" (*John* 14:6). The logic of Hume's discussion suggests that he would dismiss such testimony as more likely to derive from a powerful religious conspiracy than to be genuine. But Christians might well respond (cf. Locke *Essay* IV xvi 13, quoted in §3 above) that the evident religious content of the celestial message makes it *more* likely to be explicable by supernatural means than some non-religious alternatives (for example a comparable set of stars tracing out line diagrams of the Platonic solids). If the testimony were to be as widespread and consistent as that for the eight days of darkness, why should it not be credible?

Perhaps Hume himself had an inkling of this sort of objection, because he provides an argument that seems calculated to address it:

> Though the Being to whom the miracle is ascribed, be ... Almighty, it does not, upon that account, become a whit more probable; since it is impossible for us to know the attributes or actions of such a Being, otherwise than from the experience which we have of his productions, in the usual course of nature. (*E* 10.38)

Though ingenious, this is too quick to be convincing. If correct, it would imply that the belief in an omnipotent Deity can make no difference to the credibility of *any* inference to the unobserved, on the grounds that any such inference has to rely on induction, and induction will apply in exactly the same way whether the experience to which we appeal is taken to be expressive of brute laws of nature, or expressive of the will of the Deity. But there is a crucial asymmetry between these, because theistic explanation potentially has the power to explain not only conformity to causal laws (which account for the future in terms of the past), but also teleology (which accounts for the past in terms of the anticipated future, appealing to goals as well as to existing structures). And it

is not difficult to *imagine* a world in which explanation of natural events in terms of divine purposes would prove to be of special value.[37] Despite Hume's ingenious argument, therefore, a Deity who intervened miraculously to fulfil intelligible purposes (rather than working exclusively through uniform causal laws that reveal no teleological pattern) could indeed provide the theist with explanatory resources unavailable to the atheist. And there seems to be no reason in principle why sufficiently persuasive reports of miracles, displaying consistency of apparent purpose, should not provide supporting evidence for "a system of religion".[38] Overall, we can conclude that although Hume is right to suggest that religious miracle stories deserve to be treated with extreme caution (because of their dubious track record), it remains true that the teleological aspect of religious explanation could in principle support such stories, if only the world were such as to make that teleological story plausible.[39]

19. Is Hume's Maxim correct?

Having just seen the principal objection to Hume's arguments of Part 2, it is now time to return to Part 1 and consider again his central argument for his Maxim. Unfortunately, the Independence Assumption on which it depends is not universally valid, and as a result the Maxim itself fails. First, many forms of evidence will not yield a consistent general probability of error. Thus to take the example of §9 above, there is no particular reason why a test for some gene within a biological sample should have the same probability of giving a false-negative result when the gene is present, as it does of giving a false-positive result when the gene is absent. Indeed an exact equality here seems highly unlikely, given that any change in the test's sensitivity to the gene is likely to have opposite effects on the two probabilities. Likewise for the witnessing of marvels: there is no reason why someone, gazing over a foggy Scottish loch at twilight, should mistake a floating log for a sea monster with exactly the same probability as he would mistake a sea monster for a

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[37] Even if, as Hume will stress in *Enquiry* 11, our world does not seem to be like that. Perhaps he has here been carried away by the force of his later argument, to the effect that if we cannot discern any *moral* tendency in this world, then it is illegitimate to infer any such tendency in the world to come. That seems correct, but it does not imply in general that teleological considerations *could never* properly ground an inference beyond what is observed.

[38] See Swinburne (1996) chapter 7 and Houston (1994) chapter 11. Houston (pp. 133-5) particularly emphasises that it is question-begging against the theist to presume that everyday uniformity is *ipso facto* evidence against the miracle believer, because *that the dead always stay dead* in our experience, for example, is something she herself believes: for her, the resurrection of Jesus is precisely exceptional. The debate, therefore, cannot be decided by appeal to induction alone, but will depend on the relative general plausibility of the overall theistic account as compared with its rivals.

[39] These considerations suggest – rather ironically – that Hume's argument my be stronger against *non-religious* "miracles". For pseudo-sciences such as homeopathy, which run wildly contrary to our scientific understanding, aspire to capture repeatable, causal aspects of the world, which are not dependent on supernatural teleology and are therefore more straightforwardly testable by the inductive methods that Hume's argument presupposes.

floating log. Moreover Hume himself is surely aware of this, because in Part 2 he repeatedly makes the point that human testimony is subject to various distortions depending on the subject-matter (marvellous, religious, favouring the vanity of the reporter, etc.). This might suggest that his Maxim is not intended as a final position so much as a stage on the way, showing that miracles are hard to credit even if we start from the Independence Assumption, as a prelude to arguing in Part 2 that the Assumption is if anything too generous to the believer.

Although such a strategy would have force against some of Hume's contemporary opponents, who themselves based their support for miracles on something like the Independence Assumption,[40] it does not suffice to vindicate his argument. As Campbell and Price pointed out,[41] his Maxim runs into major problems making sense of ordinary cases whereby events (or combinations of events) that would antecedently seem hugely improbable are easily "established" by everyday testimony. Suppose, for example, that my son were to run indoors, shouting "A red lorry just bashed the wing-mirror off a yellow Mercedes at the corner". Collisions do occasionally happen there, but if I were invited to bet *in advance* on such a precisely specified event I would demand odds of thousands (if not millions) to one. My son's testimony, though generally reliable, is nothing like *that* reliable, and yet I would unhesitatingly believe such a report if told with apparent sincerity. His testimony is credible, even though it is *not* "of such a kind, that its falsehood would be even less probable, than the fact, which it endeavours to establish".[42]

Where, then, does Hume's argument go wrong? Much could be said here, but in brief, it is generally fallacious to calculate the probability of a "false positive" (where the event *M* does not occur, but is falsely reported as having occurred) by the formula used in §8 above:

$$Pr(\neg M \ \& \ t(M)) \ = \ Pr(\neg M) \times Pr(\textit{false report})$$

Even if we allow the assumption that my son has witnessed some collision, the probability that he will falsely report it as involving precisely a red lorry and the wing-mirror of a yellow Mercedes is hugely overestimated by this formula. His report could be false in a myriad ways, of which this is just one. Hence a "false positive" of precisely this type is extremely unlikely, even less likely than a "true positive" (which is why his report is indeed credible).

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[40] See for example Price (1768) §2, pp. 413-6.

[41] Campbell (1762) I §1, pp. 30-2 and Price (1768), §2, pp. 407-9, both of whom acknowledge Butler (1736) II ii 3 [§11] as having anticipated this idea.

[42] It is tempting to suggest (as does Coleman 1988, p. 334) that such examples are irrelevant to Hume's argument because the events reported are not miraculous. But this response looks ad hoc and question-begging: *the burden is on Hume* to show that miracles are a special case, and his argument claims to be based on generally applicable principles.

Hume seems to have ignored this crucial objection, though he must have read of it. Perhaps he failed to appreciate the danger because the informality of his own text led him to misremember his Maxim as resisting refutation. Possibly, like so many later critics, he sometimes took himself to be proposing only the inoffensive triviality that "we cannot accept a miracle on the basis of testimony unless we regard the miracle, given the testimony, as more probable than its non-occurrence".[43] But there is also a more interesting possibility, which is close enough to his original Maxim to be expressible in similar terms, resistant to refutation, yet also non-trivial:

> **Revised Humean Maxim**
>
> No testimony is sufficient to render a miracle *M* more probable than not, unless the testimony is of such a kind, that the occurrence of a false *M* report of that kind (*given that M does not in fact occur*) would be even less probable than *M* itself.

In the terms used above, this is roughly equivalent to saying that a report of *M* is credible only if a "true positive" would be more likely to occur than a "false positive",[44] which seems obviously right (and without having to depend on any Independence Assumption, as only *M*-reports are being considered). But note that it involves a crucial shift in perspective from what Hume's argument for the Maxim led us to expect, because it compares the probability of *M* not with the general *epistemic probability* of a given type of testimony's falsehood, but instead with the probability of such false testimony, specifically for *M*, *being delivered*.[45] This Revised Maxim thus moves from the abstract inductive epistemology of Part 1 of the essay to the more down-to-earth psychology of Part 2. With so much material in these later arguments stressing the human tendency to report miracles even in their absence, it would hardly be surprising if Hume sometimes mistook his original, faulty Maxim for this less vulnerable alternative.

20. *What is the enduring significance of Hume's essay?*

"Of miracles" is a rich, fascinating and insightful essay, though the lessons to be learned from it are not always quite those that Hume intended. Presented as a direct application of his theory of induction, its main weaknesses derive precisely from the inadequacies of that theory, which

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[43] Quoted from Noonan (2007) p. 187, who adds "This is where Part 1 ends, and it does so on an incontrovertible, indeed, near tautological, point". For other references, see note 9 in §5 and note 15 in §8 above.

[44] It is not quite the same, but is implied as long as *M*'s being unreported if true is at least as probable as *M* itself (which is almost certain to be the case if *M* is a miracle). The details of all this must wait for another occasion.

[45] Technically, this replaces inverse probability by direct probability: calculating *forward* from the envisaged events and propensity to report them, instead of attempting to calculate *backwards* from the delivery of a given report to the epistemic probability of the event reported.

emphasises crude extrapolation from experience to the neglect of other considerations that are now often expressed in terms of "inference to the best explanation".[46] We saw this clearly in §18, where he overlooks the possibility of a mutually supportive theistic framework in which miracles fit into a purposive account of the world. And a somewhat similar problem lies behind the main objection to his Maxim in §19, where his focus on the inductive evidence for and against a miracle claim apparently leads him to overlook that a report can be mistaken in many different ways. When a specific report has been presented, our assessment cannot just rely on a general abstract probability of error which is independent of the subject-matter; it has to look at the specifics, and compare the competing explanations of how that particular report is to be explained.

It is therefore somewhat ironic that the most enduring value of Hume's essay lies precisely in this explanatory direction, with his clear identification and investigation of ways in which our human cognitive failings can usefully be considered in the assessment of miracle reports. For Hume recognised the potential role of systematic "heuristics and biases" (as they are now called) within our cognitive functioning, nearly two and a half centuries before such research became fashionable through the well-known work of Amos Tversky and Daniel Kahneman.[47] This theme is obvious in Part 2, with its numerous references to flighty imagination, credulity, love of wonder, vanity, and motivated deceit, all of these magnified in the context of religion.[48] Less obvious is the extent to which Part 1 involves a similar theme, here directed not on those whose beliefs we investigate, but on ourselves as investigators. Indeed Hume's Maxim can be seen as intended precisely to correct for a powerful bias in our assessment of evidence, commonly called the *base rate fallacy*. This is clear in the diagnostic test example of §9 above, where we naturally find it all-too-easy to ignore the background "base rate" of the disease when assessing the significance of the test result. Such error is perhaps unsurprising, because the specific immediacy of the test itself – and its apparently impressive reliability of 99.9% – strike us with far more *force and vivacity* (as Hume would say) than the memory of the general "prior probability" of one in a million. But it

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[46] I am not meaning to suggest that Hume is totally wedded to a crude inductivism. But his broader insights in philosophy of science (e.g. on analogy and hidden causes) are rather unsystematic and in any case play little role within "Of Miracles". For further discussion, see the references in footnotes 19 and 23 above.

[47] Their best-known article is Tversky and Kahneman (1974), while Gilovich *et al.* (2002) is a major recent collection in honour of the research programme they began. Note that the original version of Hume's discussion of miracles seems to have been intended for the *Treatise* (Hume 1748, pp. 161-2; *NHL* 2), probably in Book 1 Part 3 together with his pioneering discussions of other human cognitive weaknesses (e.g. *T* 1.3.9.6-19, 1.3.10.4-9, 1.3.13.1-10).

[48] See §13 and §16 above, and note also our natural teleological bias made explicit in the *Natural History of Religion*.

turns out that people very commonly go wrong in this way with far less excuse.[49] Hume's Maxim – notwithstanding its weaknesses – is thus of considerable value as a vivid reminder of the need to take base rates into account. And although the Independence Assumption on which it relies is not always appropriate, where it is, the Maxim stands.

I ended §19 above by suggesting that Hume might have had in mind an alternative – and far more defensible – version of his Maxim, which is not the explicit goal of his main argument, but is readily suggested once the broader considerations of his essay come into play. This Revised Maxim nicely pulls together his initial emphasis on the inductive unlikelihood of miracles with his later stress on psychological explaining away of miracle reports. And it provides a potentially powerful response to the objection of §18, by focusing less on the improbability of miracles (which the theist can legitimately contest by appeal to divine teleology) and more on the relative probability that false miracle stories will arise through natural processes. Thus equipped, Hume need not insist – with apparent inductive dogmatism – that the theist's stories are so intrinsically incredible as to be unworthy of consideration. Instead, he can wait for our empirical science of the mind to explain such beliefs away by appeal to cognitive dispositions that are manifest more generally, and thus render the hypothesis of divine action gratuitous.[50] Understood in this way, Hume's attack on miracles turns increasingly towards the psychology of *Treatise* 1.3 and the anthropology of the *Natural History of Religion*. But the spirit of his famous essay remains.

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[49] See for instance the striking example given by Tversky and Kahneman (1974) at pp. 1124-5. Note that this same weakness seems to underlie Hume's observation in §17 above, that "I never knew any one, that examined and deliberated about nonsense who did not believe it before the end of his inquiries."

[50] For some relevant recent work, see French and Wilson (2007). The point here is that if empirical work were to show that the propagation of false miracle stories is absolutely to be expected within relevant contexts (e.g. first century Palestine), then the atheist can easily contest such stories *without* having to insist that they are in themselves vanishingly improbable. The hypothesis of supernatural action simply becomes one for which there is no need, no strong evidence, and which runs counter to all modern rigorous investigation.

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