CHAPTER 12

Weighing Up Hume's 'Of Miracles'

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Hume's argument against the credibility of testimony for miracles – in Section 10 of his *Enquiry Concerning Human Understanding* – is one of the most famous in the philosophical canon. Yet both its interpretation and its assessment are highly controversial. I have discussed the most common interpretative issues elsewhere, and will mainly pass over these here (with references to those previous discussions in case readers wish to follow them up).[1] My main aim now is to focus instead on the cogency and force of Hume's argument, and how it relates to his more general scepticism about theism as manifested in his *Dialogues Concerning Natural Religion*. So this is primarily a *philosophical* rather than *interpretative* investigation.

12.1 Hume's Argument for His Maxim on Miracles

Hume introduces his discussion 'Of Miracles' by considering probability in general, building on his account of customary inference from Sections 4 to 6. At E, 10.3, he reiterates that 'experience [is] our only guide in reasoning concerning matters of fact' (cf. E, 4.6), but he goes on to point out that the strength of evidence from past experience can vary, depending on the consistency of that experience. He accordingly enunciates his general principle:

> A wise man, therefore, proportions his belief to the evidence. In such conclusions as are founded on an infallible experience, he expects the event with the last degree of assurance, and regards his past experience as a full *proof* of the future existence of that event. In other cases, he proceeds with more caution: He weighs the opposite experiments: 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 . . . *probability*. (E, 10.4)

[1] Most such references are to Millican, 2011.

Note here the important distinction between *proof* and *probability*, drawn within the category of what we now call *inductive* inferences, and which Locke called *probable* reasonings. Crudely, *proofs* are inductive inferences that are based on such extensive and (so far) exceptionless experience that – if taken alone – they 'leave no room for doubt or opposition' (E, 6.0 n. 10).[2] By contrast, a *probable argument* (understood in the Humean sense in which this – by definition – falls short of being a *proof*) will be based on *variable* experience, such as to introduce an element of doubt.[3] So if I have seen 999 *A*s that were *B*s, and only one *A* that was not *B*, I will confidently infer that the next *A* will be a *B*, but not with *complete* certainty.

Despite Hume's description of *proofs* as 'leaving no room for doubt', he acknowledges that they can vary in strength, and accepts the possibility that they can conflict with each other, especially when testimony is involved.[4] This suggests that he views the distinction between *proofs* and *probabilities* as being less clear-cut than it initially appears. On theoretical grounds, too, one would expect that sufficiently many probable arguments, all telling in the same direction, could together outweigh any single would-be 'proof', and this casts philosophical doubt on any strict interpretation of the distinction.[5]

The assessment of testimony in general is discussed at E, 10.5–7, where Hume stresses that our confidence in it should be based on inductive principles.[6] Experience tells us that some factors tend to correlate with reliable testimony and others with unreliable testimony; so we need to weigh these up in any particular case, and sometimes they will point in different directions:

> This contrariety of evidence, in the present case, 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

[2] See Millican, 2011, §2: 'What does Hume mean by "probability" and "proof"?' The quoted footnote, attached to the title of *Enquiry* 6, explains that Hume's new distinction is being drawn within the broader category of 'probable arguments' as understood by Locke.

[3] In the *Treatise*, Hume also considers how an inductive argument can be uncertain owing to lack of experience, so that even without exceptions, probable belief arises by degrees (T, 1.3.12.2). Once we have got used to the uniformity of nature, however, we tend to draw inferences with confidence from just a few examples, or even only one (T, 1.3.12.3).

[4] See Millican, 2011, §6: 'Does it make sense to weigh "entire proofs" against each other?'

[5] Don Garrett, by contrast, interprets the distinction strictly, defending Hume's argument on the basis that a proof can legitimately be considered to 'entirely obviate, or "annihilate"' any competing probabilities (1997, 253 n. 8; cf. 2015, 304–6). The believer in miracles, however, can reasonably reject this principle, as simply taking for granted that evidence for a law of nature trumps any other consideration. Garrett's Humean argument is also subject to the objection in Section 12.4 below.

[6] See Millican, 2011, §4: 'Is Hume right to treat testimonial evidence as inductive?'

> 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, 10.7)

The very next sentence introduces the case of 'extraordinary' or 'marvellous' events:

> 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 or less unusual . . . when the fact attested is such a one as has seldom fallen under our observation, here is a contest of two opposite experiences . . . . The very same principle of experience, which gives us a certain degree of assurance in the testimony of witnesses, gives us also, in this case, another degree of assurance against the fact, which they endeavour to establish . . . (E, 10.8)

Thus the unusualness of the event is *another factor* to be weighed in the evidential balance, counting *against* those factors (e.g. large number of agreeing witnesses, of good character, delivering their testimony soberly) that incline us to believe the testimony.[7]

The next two paragraphs illustrate the familiarity and plausibility of this general point, by reference to the Roman proverbial saying '*I should not believe such a story were it told me by* CATO' (E, 10.9) and the example of an Indian prince who 'justly' refused to believe when first told about water freezing (E, 10.10). The latter example, however, suggests that Hume's argument might lead to the unwelcome conclusion that we should never accept testimonial evidence of surprising new phenomena, thus making scientific advance impossible. A footnote here (E, 10.10 n. 22) attempts to explain why the freezing of water should be judged a case of something *extraordinary* rather than *miraculous* from the prince's point of view.[8] Then in paragraph 11, we finally get the case where what the witnesses affirm,

> instead of being only marvellous, is really miraculous; and suppose also, that *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, emphasis added)

Hume's reference to 'the testimony, considered apart and in itself' seems to imply that we can meaningfully assess the strength of the testimony *in itself*

[7] For detailed explanation of this part of Hume's argument, see Millican, 2011, §5: 'How does Hume apply these principles to the case of miracles?'

[8] For references to various discussions of this attempt, see Millican, 2011, 167 n. 19.

without regard to the particular event for which it testifies, and hence indicates that he is committed to something like the following assumption:[9]

> 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.*

Moreover, some such assumption seems required if we are to be able coherently to balance 'proof against proof, of which the strongest must prevail'. Hume is clearly thinking here of two distinct 'proofs', one constituted by the (here very positive) features of the kind of testimony that has been presented for the miracle, and the other constituted by the inductive evidence against the miracle. He supposes that each of these two proofs has a distinct strength of its own, and these are to be weighed against each other to judge which is the stronger and is thus worthy of determining our belief.

Though I shall be rejecting it, this Independence Assumption would probably not have been considered particularly controversial by Hume's opponents, because a similar assumption was commonly taken for granted in arguments favouring miracles. Here is Richard Price *opposing* Hume:

> Improbabilities *as such* do not lessen the capacity of testimony to report truth. The only causes of falsehood in testimony are the intention to deceive, and the danger of being deceived. . . . suppose a case where there are no motives to deceive, and where . . . the danger of being deceived . . . is such as makes testimony liable to be wrong once in ten times. Now, I say, that such testimony would communicate its own probability to *every* event reported by it of which sense is *equally* a judge, whether the odds against that event, or the previous improbability in it is more or less. . . . It is obvious that similar observations might be made on the other cause which I have mentioned of falsehood in testimony. If in any case it cannot be supposed that a witness is deceived, his report will give an event that precise degree of probability which there is of his not intending to deceive, be the event what it will. (Price, 1768, §2, 413–16)

Hume's argument – which Price is strongly attacking – appears to be founded on the very assumption that he is urging against it.[10]

[9] See Millican, 2011, §8: 'Can Hume's Maxim be derived mathematically?'

[10] This quotation highlights an issue that will prove important in Section 12.3, in that Price focuses initially on the *causal* (direct) probability of a true report being delivered but then seems to move towards the *epistemological* (inverse) probability of a given report's being true when he says that 'such testimony would communicate its own probability to *every* event reported by it'.

Paragraph 12 of Hume's essay vividly reemphasises, with illustrative examples, that miracles would be extreme instances of events rendered improbable by our experience, running wildly contrary to our understanding of the 'laws of nature' and hence requiring equally extreme testimony to make them plausible:[11]

> 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, though more unusual than any other, has yet 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)

A footnote to the end of this paragraph clarifies Hume's understanding of 'miracle':

> 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. (E, 10.12 n. 23)

It also clarifies that whether some event is genuinely 'contrary to the laws of nature' is not always obvious to us. But it does not raise the question whether our understanding of the laws of nature might be inadequate (as was the case with the Indian prince).

'Of Miracles' Part 1 ends by presenting Hume's Maxim on Miracles, in terms that strongly echo paragraph 11, again presupposing something like the Independence Assumption in assigning a characteristic 'force' to any specific 'kind' of testimony:

> HUME'S MAXIM on MIRACLES: '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:

[11] For nuances in Hume's notion of such a law, see Millican, 2011, §11: 'What does Hume mean by a 'law of nature'?'

> 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."' (E, 10.13, emphasis added)

But despite Hume's confident words, this isn't exactly 'plain', either in meaning or as an obvious conclusion of his argument. To start with, we might wonder what it is to 'establish' a miracle, and what it means for one thing to be 'more miraculous' than another. But both of these points are at least somewhat clarified by the remainder of this crucial paragraph:

> When any one tells me, that he saw a dead man restored to life, I immediately consider ... *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 the event which he relates; *then, and not till then, can he pretend to command my belief or opinion*. (E, 10.13, emphasis added)

Here the process of weighing two miracles against each other seems to be equated with assessing their relative probability, and the criterion for reasonable 'belief or opinion' appears to be simply that the claim in question is more probable than not, which – in the context of the Maxim – is presumably to be interpreted in terms of the relative strength of the 'proofs' on each side.[12] This seems to be somewhat Bayesian in spirit, with the strength of the two 'proofs' providing a sort of *prior probability* on each side, and the weighing operation yielding an overall *posterior probability* for the miracle's occurrence, after both sides have been taken into account.[13]

12.2 Testimony for Improbable Events: Where Hume Goes Wrong

In assessing Hume's Maxim, it will be helpful to start by considering the case of reported events that are merely improbable, rather than supposed

[12] For further elaboration of these points, see Millican, 2011, §7: 'How Should Hume's Maxim be Interpreted in Probabilistic Terms?' A footnote to that section briefly discusses the latter part of Hume's Maxim, concerning the 'mutual destruction of arguments', which for simplicity I ignore here.

[13] If the weighing were instead interpreted as involving the *posterior* probabilities on each side, then it would become entirely trivial, simply advising belief in whichever is the more likely all things considered, without giving any method for determining which side that is. Hume, however, is clearly attempting to specify such a method in terms of two distinct 'priors' (though not exactly of the Bayesian sort, and significantly predating the 1763 publication of Bayes' Theorem).

'violations of the laws of nature'. The very same probabilistic principles to which he has been appealing seem to imply that his Maxim will apply as follows:

> HUME'S MAXIM, applied to IMPROBABLE EVENTS: 'That no testimony is sufficient to establish an improbable event, unless the testimony be of such a kind, that its falsehood would be even more improbable, than the fact, which it endeavours to establish.'

In some cases, this works well, for example a yes/no test for a genetic condition *G* which afflicts one person in a million, where the reliability of the test is such 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 per cent, and an incorrect diagnosis only 0.1 per cent (so Hume's Independence Assumption applies). Here the initial probability of false 'testimony' (i.e. a false test result) is far greater than the initial probability of the disease, so the test falls well short of establishing the disease.[14] And the threshold of credibility for such a test is reached precisely as the Maxim implies: if the initial probability of having *G* were greater than 0.1 per cent (rather than only 0.0001 per cent), then a positive result would be enough to make *G* more probable than not. This sort of example can have real psychological impact, because in such cases, most people are naturally inclined to ignore the 'base rate' (here one in a million) and to be overly influenced by the individual test result. So we can give Hume credit for implicitly identifying what has since become familiar as the *base rate fallacy*. But it turns out that his Maxim gives the right answer here only because the genetic test involves a simple yes/no decision, with just one way for the test to be incorrect. With more complicated examples, as we shall see, significant problems emerge.

Consider, for instance, a daily 'lucky draw', reported by a newspaper, which has four possible outcomes. The most likely outcome is *A*, followed by *B*, which is 100 times less likely, then *C* and *D*, each in turn 100 times less likely again (so *C* is 10,000 times less likely than *A*, and *D* is 1,000,000 times less likely than *A*). The newspaper reports the result correctly 97 per cent of the time, and when it goes wrong the remaining 3 per cent are evenly distributed over the other three outcomes (e.g. when the result is *A*, there is a 97 per cent chance of *A's* being reported and a 1 per cent chance

[14] 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* positive tests against 999,999 *false* positives, meaning that the probability of a positive test's being true is 1 in 1,002. This example is presented more fully in Millican, 2011, §9: 'Is Hume's Maxim of Practical Value?'

each of *B*, *C*, and *D*). On this basis, out of 101,010,100 cases, we could expect the following statistics:

		A Reported	B Reported	C Reported	D Reported
	TOTALS	97,010,101	1,970,101	1,019,701	1,010,197
Outcome A	100,000,000	97,000,000	1,000,000	1,000,000	1,000,000
Outcome B	1,000,000	10,000	970,000	10,000	10,000
Outcome C	10,000	100	100	9,700	100
Outcome D	100	1	1	1	97

Here the figures for the reliability of testimony differ wildly depending on what is reported: an *A* report chosen at random has 99.99 per cent probability of truth (97,000,000 out of 97,010,101), a *B* report 49.24 per cent probability (970,000 out of 1,970,101), a *C* report 0.95 per cent probability (9,700 out of 1,019,701), and a *D* report less than 0.01 per cent (97 out of 1,010,197). What value, then, can we reasonably assign as the force of 'the testimony, considered apart and in itself' and independently of the event reported? The only sensible percentage figure to take here would seem to be 97 per cent, the consistent *prior* probability of true testimony being generated. But notice that as soon as we know which event has been reported, our *posterior* probability will justifiably change: testimony for the most likely outcome *A* is far more credible than testimony for outcome *B*, and so on down through *C* and *D*. This is indeed exactly the point that lies behind Hume's Maxim – *that testimony for less probable events is ipso facto less credible* – but nevertheless this example tells against the Maxim.

With 3 per cent prior probability of error (as just discussed), an *A* report is almost certain to be true, while a *B* report very nearly reaches the 50 per cent level. For a *C* report to reach an equivalent level, the prior probability of error must be less than 0.03 per cent, and for a *D* report, 0.0003 per cent. There is clearly a pattern here, but it does not fit with Hume's Maxim. If we calculate the relevant expected proportions of our 101,010,100 cases, and put those alongside the prior probability of error that is needed for a report to get close to the 50 per cent level (call this the 'credibility error threshold'), we see this:[15]

[15] Note that the lack of round numbers in the 'proportion' and 'resulting probability' columns correspond, and if the proportions were to be tweaked upwards by adjusting the frequencies, then likewise the probabilities would rise closer to 50 per cent. Note also that an *A* report will *always* be credible (unless the testimony is, perversely, of such a kind that it is almost always false, so that a report of *A* counts very strongly *against A*'s actual truth).

	Frequency out of 101,010,100	Proportion out of 101,010,100 (%)	Credibility Error Threshold (%)	Resulting Report Probability (%)
Outcome A	100,000,000	99	–	–
Outcome B	1,000,000	0.99	3	49.24
Outcome C	10,000	0.0099	0.03	49.74
Outcome D	100	0.000099	0.0003	49.75

So if the testimony is 'of such a kind, that its falsehood would be' only 3 per cent probable, then this is roughly 'sufficient to establish' an event whose initial probability is around 1 per cent (as with *B*). Likewise, testimony whose probability of falsehood is respectively 0.03 per cent or 0.0003 per cent is roughly sufficient to establish an event whose initial probability is respectively 0.01 per cent (*C*) or 0.0001 per cent (*D*). *Hume's Maxim therefore gives the right sort of pattern here, but is consistently out by a factor of three*. And the reason is straightforward, because in this scenario, a report that is false can be false in three different ways, and Hume's reasoning has failed to take into account the impact of such variety of falsehood.

Hume's Maxim goes even more seriously wrong with conventional lotteries, an objection urged against him by various critics over the years. Imagine, for example, a weekly lottery of exactly 1,000 tickets, which is regularly reported by a local newspaper. Let us suppose that the lottery organiser telephones the newspaper office to convey the (one) winning number, but that the clerk responsible for noting this down is a bit careless, and has just a 99 per cent chance on any specific occasion of reporting the correct number (reporting a different number at random in other cases). The rest of the news production process is error-free, so *we can expect the reported number to be correct 99 times out of 100*. Knowing this, if in some week I hold ticket number 718 and read in the newspaper that 718 is indeed the winning number, then it seems that I should believe I have won with a confidence of 99 per cent. But according to Hume's Maxim as most naturally interpreted, I should not believe the report unless the probability of the newspaper's getting it wrong (1 per cent in this scenario) is even less than the initial probability of 718 winning (1 in 1000, or 0.1 per cent). So I should not in fact believe the newspaper report, which seems radically contrary to common sense.

The correct way of thinking about these things, however, is to focus not on the simple comparison between a *true* report and a *false* report, but more discriminatingly, on the comparison between a *true positive* report

and a *false positive* report. So if we are interested in the event *W* of ticket 718 winning (as has been reported), then we need to compare the probabilities of:

A true positive report: W occurred and was truly reported as having occurred
A false positive report: W did not occur, but was falsely reported as having occurred

In our lottery case, the corresponding probabilities are:

A true positive report: 0.1% × 99% = 0.099%
A false positive report: 99.9% × 1% ÷ 999 = 0.001%

To explain the latter, a false positive requires: (a) that ticket 718 should not win (99.9 per cent probability); (b) that a false report should be made (1 per cent probability); and crucially (c) that of all the 999 false possibilities, number 718 in particular should be randomly chosen as the reported number (probability 1/999). Overall, therefore, a true positive report (0.099 per cent) is ninety-nine times more likely than a false positive report (0.001 per cent), and hence I should believe the report with 99 per cent confidence, which – in accord with common sense – fits exactly with the average reliability of the newspaper on such reports. As in the previous example, therefore, Hume's Maxim incorrectly tells us to reject a credible report, but in this case it gets the relevant probability wrong by a factor of 999 rather than only 3.

12.3 Repairing Hume's Position on Improbable Events

This objection to Hume is very serious, because it identifies a specific fault in his argument. As we saw clearly in the lucky draw example, in cases like these *Hume's logic applies in general terms* – that is, testimony for more initially improbable outcomes indeed turns out to be proportionally less credible – *but his argument is nevertheless incorrect in detail*, because it overlooks the crucial factor of multiple possibilities of error. It might be thought that this could be corrected, at least in these sorts of cases, by taking that factor explicitly into account within a modified Maxim. But any such repair could not feasibly be generalised to more diverse scenarios, where the variety of possible erroneous reports might be huge, and different sources of error could have very different probabilities.[16] Even

[16] For another kind of example, see Millican, 2011, §19: 'Is Hume's Maxim correct?', 185–86.

where such a remedy could work, moreover, the very need for it highlights a serious lacuna in Hume's argument, so we cannot rely on that argument as it stands.

Another point highlighted by the discussion above concerns the fundamental distinction between *direct* and *inverse* probability. In the lucky draw example, we started from presumed knowledge of the *direct* (causal) probabilities involved: that certain outcomes would come about, and that reports of those outcomes would then be generated (either truly or falsely). We then calculated the *inverse* (epistemological) probability that a given report would be true or false, and we found, in line with Hume's general argument, that the probability of truth would be radically different for *A*-reports, *B*-reports, *C*-reports, and *D*-reports. An important consequence of this is that if we try to identify a single value for the characteristic 'force' of this kind of report – 'considered apart and in itself' and independently of the event reported – then the only plausible figure is the *direct* probability that such reports will be generated truly rather than falsely.

The words of Hume's Maxim, however, give a contrary impression, whereby we are faced with an instance of some 'kind' of testimony and are considering the relevant *inverse* (epistemological) probability of its being true or false. When these probabilities are so different for *A*-reports, *B*-reports, *C*-reports, and *D*-reports – *as Hume's own argument insists* – the only way of interpreting his Maxim in terms of such inverse probability would be to treat all of these as different 'kinds' of testimony. But then the Maxim seems useless, because in order to apply it, we *first* have to calculate the relevant inverse probability for that specific 'kind' of report, which makes the Maxim superfluous.

To salvage what we can from Hume's Maxim, we need to revise it so that we start from *direct* probabilities rather than *inverse* probabilities, and focus on the direct probability of a *false positive* report of the specific event in question.

> REVISED HUMEAN MAXIM on IMPROBABLE EVENTS: 'That no testimony is sufficient to establish an initially improbable event M (i.e. render it 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.'

This Maxim can be derived mathematically (on the plausible assumption that *M*'s occurrence is less probable than *M*'s going unreported if true).[17]

[17] See Thornhill-Miller and Millican, 2015, 11–12.

But though more cogent than Hume's original Maxim, it is less ambitious and cannot pretend to be an all-purpose 'magic bullet' against the credibility of miracle reports (or reports of other initially improbable events). Faced with such a report, this Maxim cannot offer a blanket dismissal, but instead requires us to consider the specifics of the case and how likely it would be for *that very type of event* to be falsely reported. Having started from Hume's epistemological discussion in Part 1 of his essay, therefore, we would have to shift our focus far more towards *empirical psychology*, to which Hume himself turns only in Part 2 (as will be discussed in Section 12.5 below).

12.4 From Improbable Events to Miracles: A Dubious Conflation

We have seen how Hume's Maxim, the culmination of his discussion in 'Of Miracles' Part 1, arises naturally (albeit not entirely soundly) from probabilistic principles as applied to testimony for events that appear inductively to be *statistically improbable*. His discussion also embraces testimony for events that would be *miraculous*, and Hume seems to take for granted that these two categories should be treated in the same way – indeed, he introduces miracles into the discussion as extreme cases of 'extraordinary' and 'marvellous' events (at E, 10.11, following on from E, 10.8). There is some obvious similarity between these categories, in that both are likely to provoke our doubt or even complete incredulity. Moreover, the Revised Humean Maxim derived above could, in principle, reasonably be applied to both of them in the same way, if we are able to quantify our judgment of their unlikelihood on a similar probabilistic scale. But despite these similarities, I would like to suggest that the two categories should be considered separately because of the quite different basis on which we assess them to be unlikely.

One strong indication of a problem here is an oddity in Hume's procedure, when he urges that testimony for a resurrection should be considered unbelievable because it runs counter to our consistent inductive evidence that no dead man coming to life 'has . . . been observed in any age or country' (E, 10.12). Presumably he is not here including – as part of his observational *premise* – that Jesus' alleged resurrection did not take place, because that would crudely beg the question against any Christian believer. So Hume seems more likely to be arguing from the absence of any *recent, well-attested case* of a resurrection, to draw the conclusion that Jesus was not resurrected either. But then the Christian is unlikely to dispute

Hume's premise at all: indeed, she will agree that in general, the dead stay dead, and even that our uniform experience of this constitutes a *proof*, in Hume's sense, of a *natural law* to that effect. The disagreement between Hume and the Christian does not concern such natural laws, but rather, whether or not God has intervened to suspend them in one particular case (thus supposedly demonstrating Jesus' divinity, precisely because rising from the dead is in violation of a natural law).[18]

Thus in arguing by simple induction from the mortality of other men (which the Christian accepts) to the mortality of Jesus (which the Christian rejects), Hume is refusing to engage with the Christian's core thesis that special divine intervention might reasonably be considered as reconciling the general rule with that one prominent exception. A similar objection can be pressed against a reframing of Hume's argument as a sort of dilemma for the theist, made popular by J. L. Mackie:

> Where there is some plausible testimony about . . . what would appear to be a miracle, those who accept this as a miracle have the double burden of showing both that the event took place and that it violated the laws of nature. But it will be very hard to sustain this double burden. For whatever tends to show that it would have been a violation of natural law tends for that very reason to make it most unlikely that it actually happened. (Mackie 1982, 26)

Evidence for the would-be miracle may indeed be hard to find, but it would be sought in such things as witness reports and physical traces, rather than in the inductive evidence for the law of nature that was supposedly violated (and on which the atheist and theist are likely to be entirely in accord). There is no serious dilemma here, just distinct bodies of evidence.

Along with testimony and physical traces, the religious believer is likely to claim that miraculous interventions can also be confirmed through their religious significance: that they would *make sense* as resulting from some presumed divine purposes. In 'Of Miracles', however, Hume mostly ignores the possibility that appeal to divine intentions could justify expectations that are not purely inductive. Only towards the end does he provide a suspiciously glib argument which seems intended to oppose this idea:

[18] Note, moreover, that this is entirely in line with Hume's own 'accurate' definition of a miracle quoted in Section 12.1, as 'a transgression of a law of nature by a particular volition of the Deity, or by the interposition of some invisible agent' (E, 10.12 n. 23).

> 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. This still reduces us to past observation, and obliges us to compare the instances of the violation of truth in the testimony of men, with those of the violation of the laws of nature by miracles, in order to judge which of them is most likely and probable. (E, 10.38)

Though ingenious, this argument is flawed, because miracles are precisely supposed to be *exceptional* interventions into an *otherwise lawlike* environment. Within this context, the religious believer is right to claim that purposive activity would be identified using different criteria from those that apply with natural laws. And if things were to happen that made compelling religious sense but seemed utterly inexplicable as the blind outcome of physical laws – such as stars spelling out religious messages or meteorites systematically targeting evil people – then it could become entirely rational to see these as instead being caused by some 'invisible intelligent power' (NHR, 2.5, 4.1, 5.2).[19]

12.5 Rejecting the Supernatural: Part 2 of Hume's Essay

Perhaps the main reason why so many people now reject claims of supernatural intervention is that we have negligible evidence for *any events at all* that provide such compelling evidence of the action of invisible intelligent agents. It is not that such well-attested miracles are merely *unusual*, but that they are *non-existent*. If they were merely unusual – so we were all convinced that supernatural agents indeed intervene from time to time, though in a way that is apparently random – then we might well assess testimony for such an event in much the same way as we would with other improbable events (for example, using the Revised Humean Maxim). But those of us who reject supernatural interventions entirely – which I take to include Hume – are in a quite different epistemological situation. We look in particular at the dismal history of huge numbers of reported miracles through the ages, urged in favour of countless different religions (of which at least the vast majority have to be false), and the absence of even a single case that has unequivocally stood up to objective

[19] For more detail on this argument and relevant examples, see Millican, 2011, §18: 'Can divine teleology provide a response?'

critical scrutiny where that was possible.[20] This is the first of three strong points that Hume makes at the beginning of Part 2, arguing 'that there never was a miraculous event established on [conclusive] evidence' (E, 10.14–15). As his second point, Hume draws attention to the foibles of human psychology, and in particular our fondness for '*surprize and wonder*', and for passing on stories which excite these emotions in others (E, 10.16). In the same spirit, he then goes on to highlight the strong temptation towards religious deceit:[21]

> 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 . . . and supernatural events, which . . . 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, and ought reasonably to beget a suspicion against all relations of this kind. (E, 10.17–19)

Hume's third point, which draws on the previous two, is that most contemporary believers in miracles base their belief on ancient historical accounts, rooted in a pre-scientific world where magical occurrences were considered relatively commonplace (E, 10.20). These three arguments add up to a strong case against belief in supernatural interventions, and the subsequent development of historical scholarship and of psychology – especially the modern subfield of cognitive science of religion – has only increased their force.[22]

12.6 Conclusion: The Strengths and Weaknesses of Hume's Position

As we saw in Section 12.1, Hume's argument for his Maxim in 'Of Miracles' Part 1 purports to be founded on basic principles of inductive

[20] Hume argues that miracle stories from contrary religions must implicitly disconfirm each other, but this is technically incorrect, as explained in Millican, 2011, §14: 'What is going on in Hume's 'contrary miracles' discussion?' The fact remains that most different religions which make claims about supernatural agents are mutually incompatible, and this systematically undermines the supposed evidential force of miracle claims in favour of those religions.

[21] Hume later returns to this point, highlighting the particular unreliability of miracles that are associated with 'popular religions' and accordingly proposing '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). See Millican, 2011, §16: 'Why does Hume strengthen his Maxim against religious miracles?' and §17: 'Is Hume's dismissal of miracles stories overly dogmatic?' In his *Natural History of Religion* of 1757, Hume highlights how people tend to be drawn towards religion by hopes and especially fears – for relevant quotations from NHR, 2.5–3.3, see Millican, 2011, §13: 'How does Hume explain the propagation of miracle stories?', 175–76.

[22] For a detailed presentation of a Humean case against supernatural belief, in the context of a survey of relevant cognitive science of religion, see Thornhill-Miller and Millican, 2015.

probability, whereby the *general* improbability of a given type of event, and the *general* epistemological 'force' of some kind of testimony, are to be assessed in terms of past experience, and – when they are in opposition – weighed in the balance against each other. The argument is elegant and superficially persuasive, but it is problematic in assuming that the evidential force of some kind of testimony can indeed legitimately be assessed *in general*, independently of the *specific* type of event for which it testifies. The lucky draw example of Section 12.2 illustrated how Hume's own reasoning puts pressure on this assumption, since in this sort of case he would be correct to maintain that testimony for an initially improbable event (such as outcome *D*) is *ipso facto* far less credible than testimony for an initially very probable event (such as outcome *A*). And this is arguably the most important insight to come from his argument: that *base rates matter*.

One implication is that if, in such a case, we seek some consistent measure of testimonial 'force' to figure within Hume's argument, then this must be measured not in terms of the (inverse) *epistemological* probability of some given item of testimony's being true – precisely because this is so variable – but rather, in terms of the (direct) *causal* probability of such true testimony being delivered. The latter, however, looks far less plausible as something to be weighed in the balance against the unlikelihood of the event reported. And indeed, it is the former *epistemological* probability that bears the sort of neat relationship with overall credibility that Hume's Maxim requires. But even this neat relationship fails to fit with the Maxim, owing to the complicating factor of multiple sources of error, which Hume completely overlooks. To salvage anything that is sound and plausibly similar to his Maxim, therefore, we need to take that factor explicitly into account, with the Revised Humean Maxim of Section 12.3 framed not in terms of *the general epistemological 'force' of some kind of testimony*, but rather, in terms of *the direct probability of a specific positive report being delivered falsely*. That is, we need to consider *the probability that a report like this would have been forthcoming if the event in question did not happen*. The Revised Maxim is correct, but it cannot provide the sort of *general* magic bullet against improbable testimony that Hume hoped to establish.

Turning now to the case of testimony for *miracles*, let us start by imagining a debate between an atheist and a theist in which both are willing to treat a miracle – at least for the sake of their discussion – as simply *an extremely improbable event* (on a par, perhaps, with a particular number's being drawn first in a lottery of a billion tickets). In that case, the same points already made would apply, and in much the same way.

Hume's Maxim as stated would fail, but the Revised Maxim would operate, providing some check on belief in such a 'miraculous' event by forcing the agreed 'base rate' of underlying improbability to be taken into account. But this would not rule out the *possibility* of sufficiently strong testimony to justify reasonable belief in an event of such initial improbability. Given the vagaries of human psychology, however, plausible achievement of such strength of testimony would very likely require *multiple* witnesses of established *individual reliability*, whom we also know to be *independent* of each other. And especially in the case of miracles that are associated with any popular religion, the atheist will have obvious reason to doubt such claims of independence.[23]

Both atheists and theists, however, could for different reasons be reluctant to treat a miracle as just an extremely improbable event. On the one hand, most atheists will want to insist, with Hume, that a miracle is far more than just *improbable*, because it is *a violation of a law of nature*, and hence physically *impossible*,[24] justifying even more scepticism than the Revised Maxim would imply. But on the other hand, theists might well deny that miracles – as *divine interventions into the natural order* – are anything like as improbable as Hume supposes. Here we face a fundamental disagreement between naturalism and supernaturalism, which cannot straightforwardly be decided on the basis of inductive evidence, not least because interpretation of that evidence may crucially depend on our metaphysical assumptions. Hume himself attempts to evade this problem, as we saw in Section 12.4, by arguing (at E, 10.38) that even God's supposed miraculous interventions can properly be judged by inductive criteria. But this argument is unconvincing, because it is entirely possible for events to be such as to make good sense within a purposive account of divine activity, yet to be utterly inexplicable inductively. No such events are apparent and well-attested, but *if they were*, then the case for miraculous intervention by 'invisible intelligent power' could be compelling.

This issue is also potentially impacted by *natural theology*, notably the Design Argument, which Hume so effectively critiques in his *Dialogues Concerning Natural Religion*. If that argument succeeded in proving the existence of a benevolent deity from the *general* workings of nature, then this would surely *somewhat* increase the probability of miraculous interventions, as compared with an atheist baseline. And here Hume's argument of E, 10.38 could become relevant, plausibly limiting this increase in

[23] For an extensive theoretical discussion strongly backing up such suspicions, see Ahmed, 2015.
[24] See Millican, 2011, §15: 'How can Hume describe miracles as 'absolutely impossible?'

probability, on the principle that if empirical evidence of *particular* interventions by the deity were non-existent, then this would point towards a deity who could – *but does not* – intervene. It would still remain the case, however, that sufficiently impressive evidence of specific purposive activity could force us to accept that supernatural interventions have in fact occurred (whether involving the deity or some other 'invisible agent').

All this undermines Hume's attempt to provide a fundamental theoretical objection against testimony for miracles by treating them as extreme cases of improbable events. A vanishingly small initial probability would indeed make them hard to establish inductively (as illustrated by outcome *D* in the lucky draw example of Section 12.2). But whereas Hume wants to treat violations of laws of nature as 'off the scale' of improbability in the sense of being *extreme* cases of that kind, the theist is likely to see them as being 'off the scale' in a quite different sense, because they would imply precisely that *the world is not operating according to standard natural laws*, and hence the probability of such violations cannot properly be assessed on the inductive basis of 'business as usual'. To argue from probabilities that are observed when the world is operating purely by natural laws, to draw firm conclusions about what can happen even when God is supposedly intervening, looks like begging the question.[25] And again, it cannot be ruled out *in principle* that supernatural power could be convincingly demonstrated – even against a background history of entirely law-governed naturalistic uniformity – by an exhibition of transparently purposive cosmic power, such as the stars visibly moving in the heavens to spell out clearly '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). Suppose that such a heavenly display had been recorded across all inhabited lands in 1600, and that reports of this momentous event later came by ship to England, quite independently and with no realistic possibility of collusion. That could, apparently, provide convincing testimonial proof of a miracle, as I suspect Hume himself would concede.[26]

[25] Recall, as in the case of the resurrection discussed in Section 12.4, that the theist can readily agree with the atheist that the standard laws of nature operate most of the time and hence that inductive 'proofs' drawn from such experience can reliably yield truth *in that situation*. But divine intervention would fundamentally *change* the situation, in much the same way as a bitter Russian winter undermines the expectations of Hume's Indian prince (E, 10.10 n. 22).

[26] This example is based on Hume's own at E 10.36, which he presents as showing that 'there may possibly be miracles . . . of such a kind as to admit of proof from human testimony'. But contrary to Hume, I claim that the transparent religious significance of this adapted example could make it *more* rather than *less* credible: see Millican, 2011, 182–83.

Describing an *imagined* case in which divine activity might be testimonially established, however, does nothing to support the claim that our world *actually* includes such divine activity. Indeed, the very fact that we can describe such a case highlights the failure of our world to deliver anything comparable. And many informed people – impressed by the increasing power of science to explain so much of what we experience in terms of natural laws – will agree with Hume that there is no significant evidence of genuine supernatural activity in the world. Such 'evidence' as has been presented correlates so strongly with human passions and cognitive foibles, fails to paint any coherent picture of the supposed supernatural agents, and has such a hopeless track record of standing up to objective critical scrutiny, that we very reasonably deny it any credibility. And this, I suggest, is why we can also reasonably reject any miracle report – a point worth highlighting:

> *It is our lack of any good evidence for supernatural interventions in general that is epistemologically crucial in justifying rejection of any miracle report, not the specific 'proof' against the alleged miracle.*

To confirm this, on the one hand, we have already observed in Section 12.4 that the Christian can be just as willing as Hume to endorse the 'proved' law of nature that the dead stay dead – indeed, she wants to insist on it, precisely to highlight Jesus' exceptional nature. Hence the 'proof' against human resurrections has no negative impact whatever on her position. While on the other hand, if we had compelling first-hand observational evidence of 'a person, claiming divine authority' who seemed able 'to order many natural events, which immediately follow' (E, 10.12 n. 23), then we would no longer be confident that our 'proofs' of natural laws could rule out the possibility of those law's being supernaturally violated.

To sum up, Hume's argument in 'Of Miracles' Part 1 correctly emphasises that 'base rates' should be taken into account in assessing inductive evidence, thus casting doubt on testimony for statistically improbable events. But his Maxim is technically mistaken because it overlooks the factor of multiple possibilities of error, and his conflation of the statistically improbable with the miraculous is seriously problematic. The arguments in Part 2 are stronger, pointing the way towards a sceptical cognitive science of religion which has since developed into a powerful case against supernaturalism in general. Hume's own consequent rejection of the supernatural strongly informs his position in Part 1, but somewhat confusingly, because of his conflation of the statistically improbable with the

miraculous. Rejection of would-be miracles can indeed plausibly be justified by appeal to the case against supernaturalism in general (including Hume's powerful critique of the Design Argument in his *Dialogues Concerning Natural Religion*). But it is not correct to see rejection of *any particular would-be miracle* as justified by the inductive evidence for *the specific natural law* that it supposedly violates: on the contrary, that such a law holds is a necessary condition for the event's being miraculous. This is in sharp contrast to the case of a would-be *improbable but law-conforming event*, where specific scepticism can indeed be justified by inductive evidence for that particular event's statistical unlikelihood. Overall, then, there is a great deal to be learned from Hume's fascinating and stimulating discussion of miracles, but the correct lessons are not always those that he intends.