

# Hume, Induction and Reason

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## Abstract and Introduction

Hume's view of reason is notoriously hard to pin down, not least because of the apparently contradictory positions which he appears to adopt in different places. The problem is perhaps most clear in his writings concerning induction - in his famous argument of *Treatise* I iii 6 and *Enquiry* IV, on the one hand, he seems to conclude that "probable inference" has no rational basis, while elsewhere, for example in much of his writing on natural theology, he seems happy to acknowledge that such inference is not only reasonable, but is even a paradigm of reasoning against which the theistic arguments must be judged. In the face of this apparent contradiction, many recent commentators have proffered "non-sceptical" interpretations of Hume's argument concerning induction, but in this paper I sketch an alternative and perhaps less radical method of resolving the problem, by identifying a major threefold ambiguity in Hume's use of the word "reason". On this interpretation, Hume indeed sees induction as a paradigm of reasonableness in what is arguably the most important sense, but he nevertheless believes induction to be entirely non-reasonable in another sense, which though less important in common life is nevertheless very significant philosophically. A comparison with Locke can help to illuminate Hume's position, which though indeed not entirely sceptical about induction, is by no means entirely non-sceptical either.

## 1. Is Hume an Inductive Sceptic?

The analysis of Hume's argument concerning induction ("probable reasoning") is a contentious matter, on which I have written extensively elsewhere,<sup>1</sup> and unfortunately there is no time here to do more than briefly spell out my own conclusions. The most thorough and careful presentation of the famous argument is, I believe, that in Section IV of the first *Enquiry*, which I analyse as having the structure shown in *Figure 1*. On this interpretation the argument pivots about the so-called Uniformity Principle, a statement concerning the positive evidential relevance of past to future - asserting that future instances can be expected to resemble past instances - whose rational credentials are systematically examined and found wanting (at stages 9, 10, 14 and 16). This implies a somewhat sceptical reading of the argument, which indeed conforms well with the language used by Hume to express his conclusion: "... 'tis impossible for us to satisfy ourselves by our reason, why we shou'd extend ... experience beyond those particular instances, which have fallen under our observation." (T91); "our conclusions from ... experience are *not* founded on reasoning, or any process of the understanding" (E32). But the seemingly strong textual support for a such a reading extends well beyond the immediate context of the argument:

Thus all probable reasoning is nothing but a species of sensation ... When I give the preference to one set of arguments above another, I do nothing but decide from my feeling concerning the superiority of their influence. (T103)

*even after the observation of the frequent or constant conjunction of objects, we have no reason to draw any inference concerning any object beyond those of which we have had experience* (T139)

nothing leads us to this inference but custom or a certain instinct of our nature; which it is indeed difficult to resist, but which, like other instincts, may be fallacious and deceitful. (E159)

we cannot give a satisfactory reason, why we believe, after a thousand experiments, that a stone will fall, or fire burn (E162)

The problem is that the extreme scepticism suggested by these passages seems incompatible not only with a significant number of statements in favour of experimental reasoning that Hume makes in many different places, but also with the structure and logic of several important arguments in the *Treatise* and *Enquiry*, and even more

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<sup>1</sup> See Millican (1995).

fundamentally, with the general thrust of his empiricist philosophical project. Here first are some quotations which are at least problematic for any sceptical interpretation:

We infer a cause immediately from its effect; and this inference is not only a true species of reasoning, but the strongest of all others (T97n)

One who concludes somebody to be near him, when he hears an articulate voice in the dark, reasons justly and naturally; tho' that conclusion be deriv'd from nothing but custom (T225)

One, who in our climate, should expect better weather in any week of June than in one of December, would reason justly, and conformably to experience ... A wise man ... proportions his belief to the evidence. (E110)

The last of these is from Section X of the *Enquiry*, an essay whose entire argument centres on the principle that probable reasonings, and in particular those from testimony, can vary in force, implying that they are not all worthless: “the evidence, resulting from ... testimony, admits of a diminution, greater or less, in proportion as the fact is more or less unusual.” (E113). Likewise in the *Treatise* another of Hume’s most notorious arguments, concerning “scepticism with regard to reason” (I iv 1), depends completely on the idea that the force of a probable argument can diminish by gradual degrees (T181-3), while in both works Hume’s discussions of “the probability of chances” and “the probability of causes” (*Treatise* I iii 11-12, *Enquiry* VI) apparently presuppose that probable arguments can be less than certain though still in some sense respectable. The evidence of these special discussions of probability is admittedly somewhat equivocal, for it is arguable (cf. Stove 1973 p.120) that Hume’s primary purpose in these sections is simply to explain psychologically why “philosophers” judge probable arguments as they do, rather than himself to endorse those judgements.<sup>2</sup> And perhaps a similar dismissal could even be given of *Treatise* I iii 15, where Hume presents his “rules by which to judge of causes and effects” which purport to distinguish between good and bad probable reasonings. However those who take Hume himself to believe that probable arguments cannot *genuinely* vary in force will have more difficulty explaining away the contrast between demonstrations and probabilities which he draws quite explicitly at T31, clearly speaking in *propria persona*:

'Tis not in demonstrations as in probabilities, that difficulties can take place, and one argument counter-balance another, and diminish its authority. A demonstration, if just, admits of no opposite difficulty; and if not just, 'tis a mere sophism, and consequently can never be a difficulty. 'Tis either irresistible, or has no manner of force.

It is likewise hard to deny that Hume is in earnest when he advocates in the very subtitle of the *Treatise* the introduction of “the experimental method of reasoning into moral subjects” (Txi), or when he proceeds to apply this method himself not only in the *Treatise* but also in particular in *Enquiry* X and XI and in the *Dialogues*, where he vigorously attacks natural theologians for failing to “proportion their belief” to the *empirical* evidence.

We are thus faced with a major interpretative puzzle. For on the one hand Hume argues, forcefully and repeatedly, that “we have no reason” whatever to make inductive inferences; while on the other he continues to make such inferences himself, treats them as varying in force, presents rules for assessing them, describes some as “just” and “true”, and criticises natural theologians and others (including “the vulgar”) for failing to conform to the appropriate standards. This inconsistency, it should be noted, is far more problematic than the superficially similar inconsistencies that Hume famously admits to when he acknowledges his psychological inability to relinquish various other rationally unwarranted beliefs (e.g. T187, 218, 265-70). If a simple conflict between reason and belief were the only problem, then his complete answer would be clear and straightforward:

Nature, by an absolute and uncontrollable necessity has determin'd us to judge as well as to breathe and feel; nor can we any more forbear viewing certain objects in a stronger and fuller light, upon account of their customary connexion with a present impression, than we can hinder ourselves from thinking as long as we are awake, or seeing the surrounding bodies, when we turn our eyes towards them in bright sunshine. (T183 cf. E46-7)

But although such an appeal to natural weakness can indeed explain, and even pragmatically justify, our continuing to make irrational inferences and to infer unwarranted beliefs, it is hard to see how it can provide any basis for the

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<sup>2</sup>Hume’s detached language at the beginning of *Treatise* I iii 13, “Of unphilosophical probability”, provides at least a hint that he is here explaining the opinions of others rather than expounding his own: “All these kinds of probability are receiv'd by philosophers, and allow'd to be reasonable foundations of belief and opinion. But there are others, that are deriv'd from the same principles, tho' they have not had the good fortune to obtain the same sanction.” (T143)

sort of *normative* claim that Hume makes about these supposedly irrational inferences: that we *ought* to adhere to a particular set of rules when making them, or that those which are made in accordance with these rules are somehow *better* than others. Surely such normative claims require that the “superior” inferences have more than mere psychological compulsion to recommend them - that they be, at least to a minimal extent, and in some sense, *rationally well founded*. The only way that Hume can maintain a consistent position, therefore, is to acknowledge a species of rationality distinct from that which he denies to inductive inferences. Fortunately, he does just this; but regrettably, the account which he provides of it is extremely sketchy and unclear.

## 2. Three Senses of “Reason”

Hume’s use of the faculty term “reason”, and of its synonym “the understanding”, can seem frustratingly inconsistent. Sometimes, as in the title of the *Enquiry* and of Book I of the *Treatise*, and of the section in each work which discusses “the reason of animals”, he uses them to speak neutrally and naturalistically of “the reasoning faculty of brutes, as well as that of human creatures” (T176) - in this sense reason is the faculty whose role is to ascertain truth and falsehood (T415-6, 458), but it can nevertheless be “deceitful” (T180), “fallacious” (E55), “weak” (T182, E72, 76, 158), “infirm” (E161), and even “blundering” (T587).

At other times, most notably in the argument concerning induction itself but also elsewhere (e.g. T212, E138), Hume uses the two terms in a significantly different way, for here he takes them to refer to a faculty whose operations are guaranteed to be reliable, so that beliefs or inferences whose credentials are defective can confidently be ascribed to a different source: “This sentiment, then, as it is entirely unreasonable, must proceed from some other faculty than the understanding” (T193); “’tis a false opinion ... and consequently ... can never arise from reason” (T209). Typically in these cases, it is the imagination (“the fancy”) which is attributed with the questionable beliefs and inferences - indeed Hume here seems to treat the attribution of a belief or inference to the imagination (or to “custom”, which acts on the imagination - E48, 106) as virtually equivalent to the statement that it is in some way rationally defective.

Given this explicit contrast between reason and the imagination, it is somewhat surprising to find Hume apparently identifying the two faculties as one and the same: “the understanding or imagination can draw inferences from past experience” (T104). Nor is this an isolated anomaly, for Hume repeatedly attributes inferences from experience to “reason” or “the understanding” even though he has previously, and emphatically, established in his famous argument that any such inference is drawn by the imagination and “proceeds not from reason” (E54)! The following quotation, for example, seems dubiously consistent with the conclusion of the argument concerning induction:

It has been observ’d, that reason, in a strict and philosophical sense, can have an influence on our conduct after only two ways: Either when it excites a passion by informing us of the existence of something which is a proper object of it; or when it discovers the connexion of causes and effects, so as to afford us means ... (T459, cf. T414, ME285)

It might be supposed that Hume (despite his use of the word “strict”) has here reverted from what we can call the “rigorous” sense of “reason” employed in his famous argument to the neutral sense in which it encompasses all “reasonings” no matter what their rational credentials. But in fact he appears to be using the term in a sense intermediate between his neutral and his rigorous senses:<sup>3</sup>

In general we may observe, that as our assent to all probable reasonings is founded on the vivacity of ideas, it resembles many of those whimsies and prejudices, which are rejected under the opprobrious character of being the offspring of the imagination. By this expression it appears that the word, imagination, is commonly us’d in two different senses; and tho’ nothing be more contrary to true philosophy, than this inaccuracy, yet in the following reasonings I have often been oblig’d to fall into it. When I oppose the imagination to the memory, I mean the faculty, by which we form our fainter ideas. When I oppose it to reason, I mean the same faculty, excluding only our demonstrative and probable reasonings. (T117n)

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<sup>3</sup>By suggesting a three-way ambiguity I here go further than Barbara Winters (1979), who importantly established that Hume uses the term “reason” in (at least) two main senses. Note that in addition to the three senses discussed here, Hume also points out (or uses himself) various “improper” senses, which add to the potential for confusion: e.g. T414-8, 437-8, 536, 546, 583, E43n, ME239.

This footnote, which expands on the note at T371n, was specially inserted by Hume while the *Treatise* was going through the press - hence some copies of the first edition of Book I include it, while others do not. That it carries such emphatic authority is fortunate, for it indeed seems to provide an important clue as to what is going on. Although Hume has argued that probable inferences are ultimately founded on the imagination rather than on reason (in the rigorous sense), he is reluctant to see such inferences tarred with the same brush as the “whimsies and prejudices” that are considered to be the imagination’s more typical offspring. He accordingly *redefines* the term “reason” in a looser sense, so as to include both demonstrative and probable reasoning within its domain. In this sense, therefore, “the understanding” overlaps with the imagination, and might even be totally contained within it given that in the *Treatise* at least, all reasonings whatever are found to depend ultimately on the vivacity of ideas (T96n, 140, 184, 265-8). Hence following the redefinition, Hume can speak without self-contradiction of “the understanding, that is, ... the general and more establish’d properties of the imagination” (T267).

This intermediate sense of “reason” provides a partial resolution of our puzzle regarding Hume’s apparently ambivalent attitude towards induction, for it is in this sense that he unequivocally takes (suitably disciplined) probable inferences to be entirely rational. But this superficially non-sceptical position seems completely insubstantial if its only basis is a stipulative redefinition of the concept of reason: it is hard to see how such a redefinition can provide the normativity that we have seen Hume requires for his critical enterprise of distinguishing between good and bad reasoning, and between science and superstition. His apparent attempt at a persuasive definition seems, so far, to be entirely arbitrary - having discovered that probable (and maybe even demonstrative) reasoning is in fact the product of the imagination, he has chosen to dignify this particular operation of the imagination rather than others with the honorific term “reason”, but has not apparently provided any good grounds for drawing such a distinction.

Hume addresses this difficulty most directly in the *Treatise*, immediately after the section in which he has criticised “the antient philosophy” for being founded on “every trivial propensity of the imagination” (T224).

But here it may be objected, that the imagination, according to my own confession, being the ultimate judge of all systems of philosophy, I am unjust in blaming the antient philosophers for making use of that faculty, and allowing themselves to be entirely guided by it in their reasonings. In order to justify myself, I must distinguish in the imagination betwixt the principles which are permanent, irresistable, and universal; such as the customary transition from causes to effects, and from effects to causes: And the principles, which are changeable, weak, and irregular; such as those I have just now taken notice of. The former are the foundation of all our thoughts and actions, so that upon their removal human nature must immediately perish and go to ruin. The latter are neither unavoidable to mankind, nor necessary, or so much as useful in the conduct of life; but on the contrary are observ’d only to take place in weak minds, and being opposite to the other principles of custom and reasoning, may easily be subverted by a due contrast and opposition. For this reason the former are received by philosophy, and the latter rejected. (T225)

Assuming that the ancient philosopher’s theory is not actually self-contradictory, it cannot be refuted purely by an appeal to reason in the rigorous sense. But this does not mean that any judgement of it must be arbitrary, since even the principles of the ancient philosopher’s own imagination will include causal reasoning and induction. These are unavoidable, universal and irresistable, so if his theory of “*sympathies, antipathies, and horrors of a vacuum*” (T224) or whatever yields conclusions that conflict with the results of causal reasoning, then the principles on which he founds this theory can be “subverted by a due contrast and opposition”. Even the ancient philosopher ought to be consistent, so the universality of causal reasoning enables us to condemn him out of his own mouth.

We should note that it is not primarily the ancient philosopher’s *theory* which is subverted by its conflict with natural causal reasoning, but rather the *principles* on which that theory is founded. It is this that grounds Hume’s demarcation amongst the operations of the imagination, and hence gives him a weapon not only against those theories which directly contradict the results of causal reasoning, but also against any other theories which may be founded on similar principles. We can see the sketch of a systematic investigation into the various belief-forming operations of the imagination in Sections 9 to 13 of the *Treatise* Book I Part iii, although Hume’s central concern in these sections seems to be with psychological explanation and corroboration of his theory of belief rather than with normative demarcation. In Section 9, “Of the effects of other relations and other habits”, he discusses operations that are dependent on resemblance and contiguity, the non-causal associative principles, and he criticises caprice, credulity, “education” (indoctrination) and so on as means of forming beliefs because they so often lead us astray. He then turns his attention to causal reasoning, first outlining in Sections 11 (“Of the probability of chances”) and 12 (“Of the probability of causes”) those reliable methods of causal reasoning which

“are receiv’d by philosophers” (T143), and then going on in Section 13 (“Of unphilosophical probability”) to describe the various unreliable methods which are not “receiv’d”. Again his objection to the “unphilosophical” principles (judging only be the recent and near, prejudice, self-deception) is that they regularly lead us astray, and so to avoid inconsistencies in our causal reasonings he recommends that we make systematic and critical use of *general rules* (T149), not in a way that encourages prejudice, but instead in a way that enables them to be modified, to take account of exceptions as they arise, in a logical and methodical manner. The appropriate “logic” (T175) is given by his “rules by which to judge of causes and effects”, which he spells out later in Section 15.

Hume thus has the basis for a naturalistic account of his intermediate sense of “reason”, according to which beliefs and methods of inference count as reasonable if they have a place within a consistent and systematic rule-governed framework dominated by the “permanent, irresistible, and universal” principles of the imagination, and in particular by the fundamental belief in inductive uniformity and the rules by which to judge of causes and effects which systematise its implications. Hume can, of course, give no independent justification for this fundamental belief itself (given the conclusion of his famous argument concerning induction), but fortunately its inevitability entails that none is needed. The difference between “the wise” and “the vulgar”, therefore, or between “philosophers” and the superstitious, lies not in the reasonableness of their belief in uniformity, but only in how systematically they pursue its consequences: “philosophical decisions are nothing but the reflections of common life, methodized and corrected.” (E162). Crucially, however, this seems to be just enough for Hume’s critical purposes, because systematic consistency can be assessed by reason in the rigorous sense, and thus provides a non-circular and non-arbitrary norm of “rationality” in this looser sense. But why should anyone care about consistency with an unfounded belief? Hume’s answer seems to be that we are naturally motivated by curiosity or “the love of truth” (T448), which achieves some satisfaction from the working out of a systematic theory, and which is understandably focused by our inevitable assumption that the world is, truly, uniform.

In the *Treatise*, this tidy and relatively comfortable position is unfortunately not maintained, because Hume finds to his dismay that his distinction between the “permanent, irresistible, and universal” properties of the imagination and those that are “changeable, weak, and irregular” breaks down under examination, as only the latter can provide an escape from his otherwise all-consuming “scepticism with regard to reason”:

[If we] take a resolution to reject all the trivial suggestions of the fancy, and adhere to the understanding, that is, to the general and more establish’d properties of the imagination; even this resolution, if steadily executed, wou’d be dangerous, and attended with the most fatal consequences. For I have already shewn, that the understanding, when it acts alone, and according to its most general principles, entirely subverts itself, and leaves not the lowest degree of evidence in any proposition, either in philosophy or common life. (T267-8)

In the *Enquiry* and the *Dialogues*, by contrast, this extreme scepticism makes no significant appearance,<sup>4</sup> leaving Hume with a far more satisfactory position in which he can combine the result of his argument concerning induction with a healthy respect for good, systematic, scientific inductive reasoning:

To whatever length any one may push his speculative principles of scepticism, he must act, I own, and live, and converse like other men; and for this conduct he is not obliged to give any other reason than the absolute necessity he lies under of so doing. If he ever carries his speculations farther than this necessity constrains him, and philosophises, either on natural or moral subjects, he is allured by a certain pleasure and satisfaction, which he finds in employing himself after that manner. He considers besides, that every one, even in common life, is constrained to have more or less of this philosophy; that from our earliest infancy we make continual advances in forming more general principles of conduct and reasoning; that the larger experience we acquire, and the stronger reason we are endowed with, we always render our principles the more general and comprehensive; and that what we call *philosophy* is nothing but a more regular and methodical operation of the same kind. To philosophise upon such subjects is nothing essentially different from reasoning on common life; and we may only expect greater stability, if not greater truth, from our philosophy, on account of its exacter and more scrupulous method of proceeding. (D134)

It is a great shame that Hume said little, in his later works, on the demarcation between good and bad inductive reasoning. But these hints (and others) in Part I of the *Dialogues*, and in Part XII of the *Enquiry* (e.g. E162), are

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<sup>4</sup>In the *Enquiry* Hume dismisses extreme “antecedent” scepticism (E149-50) on the straightforward ground that such thoroughgoing Cartesian doubt about one’s own faculties is paralytically incurable. He also somewhat downplays his sceptical arguments concerning the external world (E151-5), which in the *Treatise* (T187-218, 226-31, 265-6) raise additional serious difficulties about the consistency of the “general and more establish’d properties of the imagination”.

enough to indicate the outlines of a mitigated scepticism that is well worth taking seriously, and whose power in distinguishing “science” from “superstition” is elegantly illustrated by his own deployment of it in his attacks on natural theology. After the *Treatise*, apparently, Hume preferred using his tools to sharpening them.

### 3. “Reason” in the Argument Concerning Induction

Although we are now relatively clear on the sense in which Hume believes induction to be “reasonable”, a little more needs to be said on the sense in which he does not. In particular, we must ask whether the rigorous sense of reason which he employs in his famous argument is of wider significance, or whether it is simply a straw-man “deductivist” sense of reason, invoked only for the purpose of showing how utterly impotent it is, so that deductivist “rationalism” can thereby be reduced to absurdity. The latter position has been most prominently maintained by Beauchamp, Mappes and Rosenberg (1975, 1981), who can perhaps largely be credited with having brought about the now widespread recognition that Hume’s attitude to “reason” elsewhere in his writings is by no means obviously sceptical. Since they wrote, several others (Arnold 1983, Broughton 1983, Baier 1991) have taken a broadly similar approach to Hume’s argument, and the points made below would apply with small variations to all of these.

According to Beauchamp *et al*, Hume in his argument concerning induction has no intention of drawing a sceptical conclusion, but is “merely concerned to show that inductive reasoning cannot provide the logical necessity which uniquely characterizes demonstrative reasoning (*a priori* reasoning) and that demonstrative reasoning cannot from its own resources alone prove matters of fact”. The argument is thus “a frontal attack on rationalist assumptions which encourage the view that at least some inductive arguments are *demonstrative*” (1975 pp.119, 121 cf. 1981 pp.37, 41). On this interpretation, therefore, Hume’s rigorous sense of reason is a purely *a priori* deductivist sense, and is adopted only in order to be dismissed.

There are two fairly well-known objections to this sort of interpretation, the first of which concerns the difficulty of making sense of Hume’s famous argument in deductivist terms - a difficulty which applies equally whether or not the deductivist sense of “reason” to which it supposedly appeals is taken to be genuinely Humean.<sup>5</sup> The problem is that if evidence must be demonstrative to count here as legitimate, then it is incomprehensible that Hume should use such a complicated argument structure to prove the lack of such evidence for the Uniformity Principle, and particularly odd that he should canvass the possibility of a “probable” justification for it (as he does at stage 16 in *Figure 1*).<sup>6</sup> This difficulty can only be increased if the appropriate sense of “reason” is supposed to be *a priori* as well as demonstrative, because before canvassing his probable justification, Hume has already argued quite explicitly that probable reasoning cannot be *a priori* (stage 6 in *Figure 1*).

The second main difficulty for any “anti-rationalist” interpretation of Hume’s argument concerns the strong language which he uses to express its conclusion. Hume consistently says that we have no good (e.g. non-circular) reason *whatever* to believe the Uniformity Principle, and he never qualifies this denial by suggesting that it relates only to some limited notion of “reason”. We have already seen some of the most explicit statements of his position, but the quotation from T139 is worth repeating in context:

Let men be once fully persuaded of these two principles, *That there is nothing in any object, consider’d in itself, which can afford us a reason for drawing a conclusion beyond it; and, That even after the observation of the frequent or constant conjunction of objects, we have no reason to draw any inference concerning any object beyond those of which we have had experience;* I say, let men be once fully convinc’d of these two principles, and this will throw them so loose from all common systems, that they will make no difficulty of receiving any, which may appear the most extraordinary.

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<sup>5</sup>Stove (1973) is the best known interpretation which claims that a deductivist understanding of “reason” is indeed genuinely Humean - this same objection is urged against him in Section 10 of Millican (1995).

<sup>6</sup>If Hume in his famous argument had indeed merely intended to show that induction cannot provide demonstrative certainty, then he could have established this conclusion immediately by deploying a version of his well-known argument from distinct conceivability, e.g. “That any inference from observed to unobserved should have all its premises true and conclusion false, is an intelligible supposition and implies no contradiction; Whatever is intelligible, is possible; Wherever a demonstration takes place the contrary is impossible and implies a contradiction; hence no inference from observed to unobserved can be demonstratively certain” (for similar or exact quotations see for example T89, A650, E35).

If Hume's ambitions had been limited to refuting *a priori* demonstrativist rationalism, then he could not have spoken in these terms. For the denial of such rationalism amounts only to inductive fallibilism, and the Lockean orthodoxy was already unambiguously fallibilist: "most of the Propositions we think, reason, discourse, nay act upon, are such, as we cannot have undoubted Knowledge of their Truth" (Locke 1690 IV xv 2, cf. IV iii 9-17, 21-29; IV vi 7-16).

So what exactly is it about Hume's conclusion that is supposed to "throw men so loose from all common systems"? His most careful statement of that conclusion is perhaps that given at E41: in all probable reasonings, "there is a step taken by the mind which is not supported by any argument or process of the understanding" (E41).<sup>7</sup> So what we seek is an interpretation of "the understanding" which would make this at the same time a legitimate implication of Hume's argument, and also a sufficiently radical result to upset the fallibilist Lockean orthodoxy. The obvious place to look is Locke's own discussion of reason and its role in probable inference.

Locke begins the chapter "Of Probability" in Book IV of his *Essay* with a definition of the key term:

As Demonstration is the shewing the Agreement, or Disagreement of two *Ideas*, by the intervention of one or more Proofs, which have a constant, immutable, and visible connexion one with another: so *Probability* is nothing but the appearance of such an Agreement, or Disagreement, by the intervention of Proofs, whose connexion is not constant and immutable, or at least is not perceived to be so, but is, or appears for the most part to be so, and is enough to induce the Mind to *judge* the Proposition to be true, or false, rather than the contrary. (1690, IV xv 1)

At the end of this chapter he makes clear that he views probability so defined as an objective matter, for depending on the evidence that we have for it "so is any Proposition in it self, more or less probable" (IV xv 6 cf. IV xx 5). Forming a "right Judgment" about such propositions is therefore "to proportion the *Assent* to the different Evidence and Probability of the thing" (IV xvi 9 cf. IV xvii 16). The faculty whose role is to "discover" probability "is that which we call Reason. For as Reason perceives the necessary, and indubitable connexion of all the *Ideas* or Proofs one to another, in each step of any Demonstration ... so it likewise perceives the probable connexion of all the *Ideas* or Proofs one to another, in every step of a Discourse, to which it will think Assent due" (IV xvii 2). Locke is no narrow Cartesian rationalist - he sees fallible probable inference as falling within the province of reason just as legitimately as does demonstration, and for him, as for Hume, the belief resulting from such inference is typically quite involuntary: "we cannot hinder ... our Assent, where the Probability manifestly appears upon due Consideration of all the Measures of it ... a Man can no more avoid assenting, or taking it to be true, where he perceives the greater Probability" (IV xx 16).

Despite Locke's fallibilism and his involuntarism, however, there is clearly an enormous gulf between his view of probable inference and Hume's. For Locke takes probabilities to be "perceived" by reason in a manner analogous to its perception of demonstrative relations, whereas Hume's conclusion is that any probable argument involves a crucial step which even if it is admitted to be "reasonable" in some sense, cannot possibly be founded on rational perception but must be supplied instead by instinct. This, then, is where Hume parts company not only with the extreme Cartesian rationalists, and with the modern "probabilists" such as Locke (and Leibniz - cf. A646-7), but with an entire philosophical tradition stretching right back to the ancients. According to this tradition, reason is a special cognitive faculty separating man from the brutes, seen by many as a manifestation of the divine image (cf. Craig 1987 ch 1). Its role is to facilitate belief not merely causally but intellectually, by yielding rational insight and real understanding either of the nature of things, or of the objective evidential relationships that hold between different states of affairs or propositions.

The significance of Hume's argument concerning induction, therefore, lies in its undermining of this broad and pervasive view of reason as a faculty of intellectual insight, by showing that any such faculty would be quite unable to "assure us of any ... matter of fact, beyond the present testimony of our senses, or the records of our memory" (E26). The notion of reason whose inadequacy is thus revealed is not merely a narrow deductivist notion, but is wide enough to include any form of intellectual perception, whether that be derived purely from intuition and demonstration (as an extreme rationalist might insist), or from the senses and probability (as Locke and Leibniz would allow). Hume proceeds by considering each of these four potential sources in turn (at stages 10, 14, 9, and 16 of *Figure 1* respectively), maintaining that none of them can provide any intellectual ground for that

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<sup>7</sup>For a substantiation of this claim, see Section 8 of Millican (1995).

extrapolation from observed to unobserved which is necessary to draw warranted conclusions about “absent” matters of fact. Thus by default, the true foundation of such extrapolation is revealed to be an animal instinct, showing that in this crucial respect man is closer to the beasts than to the angels. But Hume does not end on a purely sceptical note - instead he extends the notion of reason (most explicitly in that remarkable footnote at T117n) to accommodate inferences drawn from this essential and fundamental instinct, and indeed makes consistency with it the very criterion of scientific reasonableness.<sup>8</sup> In this paradoxical manner, an argument with a truly disturbing sceptical conclusion - *that we can perceive no reason whatever to justify any inference from observed to unobserved* - becomes the bridge to a critical but optimistic empiricism, which while committing to the flames the “sophistry and illusion” of “divinity and school metaphysics” (E165) is able to leave unscathed “the proper subjects of science and enquiry” (E163).

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## REFERENCES

In the text abbreviated titles are used for Hume’s works, and page references (to the editions specified in the bibliography below) are preceded by an appropriate letter code as follows:

T	<i>Treatise</i>	<i>Treatise of Human Nature</i>
A	<i>Abstract</i>	<i>Abstract of the Treatise</i>
E	<i>Enquiry</i>	<i>Enquiry Concerning Human Understanding</i>
ME	<i>Moral Enquiry</i>	<i>Enquiry Concerning the Principles of Morals</i>
D	<i>Dialogues</i>	<i>Dialogues Concerning Natural Religion</i>

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<sup>8</sup>There is significant internal evidence to suggest that Hume’s footnote is not merely an afterthought, but makes explicit a genuine transition in his understanding of “reason” within Book I of the *Treatise*. For in those passages which follow the footnote where he is manifestly using “reason” in a normative (rather than a neutral) sense, he apparently consistently includes probable/causal reasoning within its scope (e.g. T193, T212).

(1) Only the relation of cause and effect can take us beyond the evidence of our memory and senses

(2) All probable arguments (moral arguments, reasonings concerning matter of fact) are founded on the relation of cause and effect

(4) Any effect is quite distinct from its cause, and many alternative effects are equally conceivable

(5) Causal relations cannot be known *a priori*, but can only be discovered by experience (of constant conjunctions)

(3) The sensible qualities of objects do not reveal their causes or their effects, and there is no known connexion between an object's sensible qualities and its "secret powers"

(6) All probable arguments (moral arguments, reasonings concerning matter of fact) are founded on experience

(9) The Uniformity Principle cannot be justified by anything that we learn through the senses about objects' "secret powers"

(10) The Uniformity Principle is not intuitively certain

(7) All arguments from experience proceed upon the supposition that nature is uniform, and in particular, that similar causes will in the future have similar effects to those which they have had in the past [the "Uniformity Principle"]

(8) All probable arguments (moral arguments, reasonings concerning matter of fact) proceed upon the supposition of the Uniformity Principle

(13) The contrary of UP can be distinctly conceived, and is therefore possible

(14) There can be no (good) demonstrative argument for UP

(16) Any probable argument for UP would be circular

(11) The Uniformity Principle can only be justified on the basis of a good argument (there must be a *medium* for proving it)

(12) All (good) reasonings are either demonstrative or moral (i.e. probable)

(15) If there is a good argument for UP, it must be probable only

(17) There is no good argument of any kind for UP

**(19) CONCLUSION**  
No probable argument (moral argument, reasoning concerning matter of fact) is rationally justified, and hence it is not reason [but instead custom or habit, a non-rational instinct] which engages us to make probable inferences

(18) The Uniformity Principle cannot be rationally justified

**Fig 1 Hume's Argument Concerning Induction (from the *Enquiry Concerning Human Understanding*)**

