

Hume's Argument Concerning Induction: Structure and Interpretation

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Hume's argument concerning induction is the foundation stone of his philosophical system, and one of the most celebrated and influential arguments in the entire literature of western philosophy. It is therefore rather surprising that the enormous attention which has been devoted to it over the years has not resulted in any general consensus as to how it should be interpreted, or, in consequence, how Hume himself should be seen. At one extreme is the traditional view, which takes the argument to be thoroughly sceptical, leading to the sweeping conclusion that all "probable reasoning" or "reasoning concerning matter of fact and existence" is utterly worthless, so that Hume is portrayed as a negative Pyrrhonian intent on undermining the credentials of all our would-be knowledge of the world. But at the other extreme a number of very prominent commentators, particularly in recent years, have put forward a strikingly contrasting view, that Hume's intentions here are entirely non-sceptical, and that so far from advancing a negative thesis himself, he is merely intent on showing the implausible consequences of the "rationalist" position taken by some of his philosophical opponents.

Different conceptions of what Hume is aiming to achieve in his famous argument have, understandably, been associated with different views about its structure, its validity, and the nature and acceptability of its premises. Thus for example those who have interpreted it as only a *reductio ad absurdum* of a certain variety of extreme "rationalism" have usually been relatively happy to accept its apparently reasonable conclusion, whereas most of those who have followed the traditional line have considered Hume's conclusion to be wildly paradoxical, and have accordingly sought to find fault either with the argument's supposed premises or with its reasoning. Allegedly faulty premises have included some which are explicit (e.g. that there are only two types of argument, "demonstrative" and "probable"), and others which are claimed to be implicit (e.g. Hume's analysis of causation or even his entire "atomistic" epistemology). But the most common and serious accusation against the argument has been that Hume, in Flew's words (1961 p.82), "presupposes an exclusively deductive ideal of reason", which allegedly leads him to judge any argument as worthless unless it is deductively valid, and hence to draw sceptical conclusions about induction far beyond anything which his premises would justify. This claim, that Hume is a "deductivist", has been particularly associated with David Stove, whose analysis of Hume's argument has been more influential and more widely discussed than that of any other recent commentator.¹ Stove has vigorously attacked Hume many times, most notably in his 1965 article "Hume, Probability, and Induction" and his 1973 book *Probability and Hume's Inductive Scepticism*. Here and elsewhere Stove has argued that what he identifies as Hume's deductivism is not only an error but a pernicious canker which continues to infect much contemporary philosophical thought, especially in the philosophy of science, where he sees Hume's deductivist legacy as the primary inspiration for the massively influential but dangerously misguided "irrationalist" tradition of Popper, Kuhn, Lakatos, and Feyerabend.²

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This paper will attempt to show that Hume's argument on the one hand falls far short of the all-encompassing deductivist scepticism of which he has been so vehemently accused, and has no such disastrous implications for the rationality of science, while on the other hand being significantly more than a mere *reductio* of extreme rationalism. It will also maintain that the argument is far better than most of its critics such as Stove suppose, and that many of the most popular objections to it arise from crude oversimplifications, anachronistic

¹ Amongst many who accept Stove's interpretation more or less uncritically are Mackie (1974) pp.9, 15 and Penelhum (1975) pp.50-53. The excellent bibliography Hall (1978) says that "On the specific subject of Hume's argument for scepticism about induction, Stove's monograph is indispensable" (p.2).

² Stove (1970) contains a slightly modified version of the analysis that he first gave in "Hume, Probability and Induction", and this is further expanded in *Probability and Hume's Inductive Scepticism*. Both that book and Stove (1986) attempt, unsuccessfully in my view, to provide a probabilistic refutation of Hume, while Stove (1982) is his most sustained attack on Popper *et alia*.

misinterpretations, or simply a failure to read Hume's texts carefully and sympathetically. The interpretation presented here is intended to be based squarely on those texts, and on the logic of the reasonings which they contain. And so a major part of our task will be to spell out clearly and explicitly the arguments which Hume uses to establish his position, with far closer attention to his own words than has customarily been given.³ As we proceed, we shall see that this precision brings considerable benefits, since it will enable us to dismiss on local textual grounds alone a variety of rival interpretations. And once we have established a reliable overall picture of the structure of Hume's argument, we shall then be able to deploy this to dismiss yet more misinterpretations of his position. Before embarking on this detailed interpretation of Hume's argument, however, we must first make a choice between the three different versions of it which his writings contain.

1. The *Treatise* and the *Enquiry*

Hume's argument concerning induction was first presented in his *Treatise of Human Nature* (1739), where it occupies most of Book I, Part iii, Section 6, entitled "Of the Inference from the Impression to the Idea" (T86-92). An extended summary of the argument (which apparently considers it "The CHIEF ARGUMENT" of the *Treatise* - A651) appeared the following year in his anonymously published *Abstract* (A649-52), but by far its fullest and, in my view, clearest statement is in the *Enquiry Concerning Human Understanding* (1748), where it appears as Section IV, "Sceptical Doubts Concerning the Operations of the Understanding" (E25-39).⁴ Here we shall focus mainly on the *Enquiry* version of the argument, though reference will also be made to the earlier works, particularly where this helps to clarify the significance of Hume's terms and his general philosophical position. But although it is surely natural thus to take Hume's final and most complete statement of the argument as authoritative, the majority of previous commentators have surprisingly concentrated instead on the version in the *Treatise* (and some even on that in the *Abstract*).⁵ It may therefore be worth briefly outlining my other reasons for preferring the *Enquiry*.

To start with historical considerations, there is the fact that the *Enquiry* not only appeared nearly a decade after the *Treatise*, but was subject to a number of revisions between 1750 (the second edition) and 1777 (the first posthumous edition, which included Hume's last corrections). By contrast, and to his lasting frustration, Hume had no opportunity for a revised edition of the *Treatise* owing to its meagre sales. In addition, we have Hume's own request, expressed in the "Advertisement" which he wrote in 1775 for the volume containing the *Enquiries*, which states that the *Treatise* is a "juvenile work" and that "Henceforth, the Author desires, that the following Pieces may alone be regarded as containing his philosophical sentiments and principles".⁶ This request has not been taken very seriously by Hume's critics, who have tended to regard the *Enquiry* as merely a watered down and popularised version of the unsuccessful *Treatise*. But as we shall see there are good philosophical reasons for respecting Hume's judgement here, at least as regards the presentation of his argument concerning induction.

³ It has become almost standard for commentators on Hume's argument to criticise their predecessors, usually with justification, for paying insufficient attention to his texts. But even those who have made such criticisms most forcibly have typically themselves discussed the argument only in the most general terms, or by means of highly selective quotation, and have failed to show convincingly how their account corresponds to the actual content of Hume's writings. In what follows, I have therefore sought to avoid this danger by providing a thoroughly explicit and detailed analysis, giving in passing a clear interpretation of every individual paragraph which occurs in Hume's most extensive presentation. In view of the long-running controversy which has surrounded even the identification, let alone the assessment, of Hume's most famous argument, I hope that this careful attention to the texts will be welcomed for its accuracy rather than regretted for its relative lack of speculative excitement.

⁴ Hume (1739), (1740) and (1748). In what follows I shall refer to these as simply *Treatise*, *Abstract*, and *Enquiry* respectively, and use the letters "T", "A", and "E" to signify page references to these editions (similarly using "ME" for Hume's *Moral Enquiry*, and "D" for his *Dialogues Concerning Natural Religion*).

⁵ Those who have focused mainly on the *Treatise* include Arnold, Baier, Broughton, Fogelin and Stroud, whereas Beauchamp *et al*, Flew and Jacobson have instead concentrated more on the *Enquiry*. Stove follows the *Abstract* version, stating somewhat implausibly (and without explanation) that it is "the best in every respect" (1965 p.192).

⁶ The *Advertisement* is reproduced on page 2 of Hume (1748). On 26th October 1775 Hume wrote to his printer William Strahan, asking that it should be prefixed to all remaining copies of the second volume of his *Essays and Treatises*, the volume which contained both of the *Enquiries*, the *Dissertation on the Passions* and the *Natural History of Religion* (Hume 1932 Volume II p.301).

Perhaps the most fundamental of these is that the argument in I iii 6 of the *Treatise* is much less free-standing than that in the *Enquiry*, since it is deeply embedded in the context of Hume's investigation into our ideas of the seven "philosophical relations", and in particular, his search for the origin of the idea of causation (which extends from I iii 2 to I iii 14). In the *Enquiry*, by contrast, this search is postponed until long after the argument concerning induction, which is introduced not in relation to the idea of causation, but rather as a response to the fundamental logical distinction between "relations of ideas" and "matters of fact" (E25) and a naturally arising epistemological question: "what is the nature of that evidence which assures us of any ... matter of fact, beyond the present testimony of our senses, or the records of our memory" (E26). It is true that both versions of the argument begin with a discussion of causation, but in the *Enquiry* this is brought in not as a subject of (quasi-psychological) study in its own right, but just because it is the only relation which can take us beyond the evidence of our memory and senses (E26). The difference of orientation is clearly reflected in the language of the two presentations: the *Treatise* often talks in psychological terms (involving "impressions", "ideas" and mental processes), whereas the argument of the *Enquiry* is relatively independent of psychological considerations (and accordingly speaks more of "propositions" and their logical relations such as entailment and consistency). But it also affects their structure: the *Treatise* argument is more convoluted than it need be because it begins as an argument specifically about our mechanisms of causal inference, and only mentions "probable reasoning" in general when discussing the justification of what is commonly called his "Uniformity Principle", at which point it appeals to Hume's thesis that all probable reasoning is causal. The *Enquiry* argument, on the other hand, starts out as an investigation into the foundation of probable reasoning, and therefore introduces this thesis immediately, after which the remainder of the argument can be more streamlined and better focused, since no mention need then be made of specifically causal reasoning as such. There are in addition certain other respects in which the argument of the *Enquiry* is smoother than that of the *Treatise*: its structure is more explicit; it spells out a number of important stages which in the *Treatise* are omitted; and its appeal to the Uniformity Principle is less misleading. All of these points will be illustrated in what follows.

2. The Topic of the Argument

The argument in the *Enquiry* starts from the famous distinction known as "Hume's Fork":

All the objects of human reason or enquiry may naturally be divided into two kinds, to wit, *Relations of Ideas*, and *Matters of Fact*. Of the first kind are the sciences of Geometry, Algebra, and Arithmetic; and in short, every affirmation which is either intuitively or demonstratively certain. ... Propositions of this kind are discoverable by the mere operation of thought, without dependence on what is anywhere existent in the universe. ...

Matters of fact ... are not ascertained in the same manner; nor is our evidence of their truth ... of a like nature with the foregoing. The contrary of every matter of fact is still possible; because it can never imply a contradiction ... We should in vain, therefore, attempt to demonstrate its falsehood. ...

It may, therefore, be a subject worthy of curiosity, to enquire what is the nature of that evidence which assures us of any real existence and matter of fact, beyond the present testimony of our senses, or the records of our memory. (E25-6)

The point of Hume's investigation, then, is to examine the foundation of all our beliefs about "absent" matters of fact, that is, matters of fact which are not immediately "present" to our senses or memory (he sometimes speaks simply of "matters of fact", but clearly means to refer only to those which are *absent* despite his omission of the explicit restriction).⁷ Hume will argue that such beliefs are founded on inferences from things which we have observed to those which we have not, these inferences operating on the assumption that the latter will resemble the former. Such inferences, which Hume himself refers to using phrases such as "probable arguments", "moral reasonings", or "reasonings concerning matter of fact [and existence]", are now commonly known as "inductive" inferences, and hence Hume's argument is generally referred to as his argument concerning *induction*.

⁷ It has sometimes been suggested (cf. Bennett 1971, p.245) that Hume counts something as a "matter of fact" only if it is "absent". But this seems too strong a conclusion to draw from Hume's admittedly sometimes careless omission of the restriction (e.g. T92, E75), given that such a usage would make its common inclusion (e.g. E26, 45, 159) pleonastic; would not conform to his principal criterion for "matter of factness" (conceivability of the contrary); and would conflict outright with some of his explicit uses of the phrase (e.g. T143: "any matter of fact we remember", T469: "Here is a matter of fact; but 'tis the object of feeling, not of reason.").

There is a potential source of confusion here, because the term “induction” has a rather different traditional Aristotelian sense, according to which it denotes not reasoning from observed to unobserved, but rather reasoning from particular cases to general principles or from effects to causes (with “deduction”, correspondingly, denoting reasoning from general to particular or from causes to effects). Moreover the word continues to retain some of this connotation, and perhaps for this reason various commentators on Hume, notably Antony Flew (but also more excusably many writers of introductory books on the philosophy of science), have presented his argument about “induction” as primarily focused on inductive inferences to *universal* conclusions, that is, inferences of the form “All observed *A*’s have been *B*’s, therefore all *A*’s whatever are *B*’s”. It should, however, be clear from the extended quotation above that Hume’s concern is with *all* inferences from observed to unobserved, including singular inferences of the form “All observed *A*’s have been *B*’s, therefore this *A* (of which I now have an impression) is a *B*”. In the *Treatise*, indeed, such inferences about particulars are taken as the paradigm, as indicated by the title of the section in which the famous argument occurs: “Of the inference from the impression to the idea”. And in the *Enquiry*, too, most of the examples which Hume gives are of singular inferences. We should avoid, therefore, drawing any conclusions about Hume’s intentions from the historical accident that the topic of his famous argument is now generally referred to as “induction”.⁸ For he himself never uses the term in this context, and anyway seems to understand it not in any technical sense but merely as a synonym for “inference” (T27, 628, ME170).

Although it seems best to avoid the anachronistic word “induction” when discussing Hume’s argument, we should also guard against being misled by his own terms (viz. “moral”, “probable”, “reasoning concerning matter of fact”) for the form of inference that he is investigating. The word “moral”, for example, is now used almost exclusively to mean “ethical”, whereas when philosophers such as Hume and Berkeley speak of “moral evidence”, their meaning is instead (to quote the *Oxford English Dictionary*) “evidence which is merely probable and not demonstrative”. But even this *OED* definition is potentially misleading, because “probable” here has no mathematical connotation - Hume’s “probable reasoning” is not a matter of calculating odds but of extrapolating from observed to unobserved, and is so named not because it makes use of numerical probabilities, but simply because it is *a posteriori* and less than certain, unlike “demonstrative” reasoning (and “intuition”, which Hume classes together with “demonstration” when drawing this contrast - e.g. E25). In what follows phrases such as “probable reasoning” will be used exclusively in Hume’s now slightly archaic sense of “non-demonstrative (but nevertheless plausible) reasoning”, reserving the word “probabilistic” for reasoning of the mathematical kind, and thus providing us with a simple and unambiguous method of referring to the topic of his famous argument.

Where exactly that topic should be delimited, however, is still perhaps not quite clear, because Hume’s third characterisation of “inductive” reasoning, as that “concerning matter of fact [and existence]”, might appear to imply a distinction (between this type of reasoning and that which is “demonstrative”) somewhat different from that suggested by the related terms “moral” and “probable”. Consider, for example, the following inference (contemplated by the present author whilst writing this paper):

- (I) Hume’s First *Enquiry* was published 246 years ago
 ∴ In 4 years’ time, it will be 250 years since the publication of Hume’s First *Enquiry*

Does this count as “reasoning concerning matter of fact”? It might at first seem to do so, for both its premise and its conclusion assert straightforward “matters of fact” (contingent propositions knowable only *a posteriori*), and the inference moves from past to future, as is typical of inductive reasoning. But on the other hand the argument (I) itself (as opposed to its premise or conclusion) is more than merely “moral” or “probable” - the conclusion follows from the premise with absolute deductive certainty, as sure as the arithmetical truth that 246 plus 4 equals 250.⁹ The inference also lacks another crucial feature which Hume takes fundamentally to characterise

⁸ Flew himself may have been misled in this way. In his (1979) he defines induction as “A method of reasoning by which a general law or principle is inferred from observed particular instances” (p.159), and in his (1961) pp.71-2 and (1986) p.53, he apparently interprets Hume’s argument as applying only to “inductive” arguments thus understood.

⁹ The certainty might not seem absolute, because the universe could end before 1998. But to circumvent this complication, we can read the conclusion as a conditional (“If 4 years elapse, it will then be 250 years ...”). Deductively valid arguments “concerning matter of fact” can of course be simpler if no reference is made to the future, for instance “This is an orange flame, therefore this is a flame” (an example noticed by Stove 1973, p.37, though he fails to follow through its implications for Hume’s distinction).

“probable” reasoning, a feature to which he appeals repeatedly both in his argument concerning induction and elsewhere: namely, that of being founded on the relation of cause and effect and hence on experience (he makes the explicit claim that all “reasonings concerning matter of fact” are so founded numerous times in the *Enquiry*, and not only in Section IV: see for example E42, 76, and 104). Taking these points together I am sure that Hume, had he considered the matter, would have classed (I) as a “demonstrative” rather than as a “probable” argument (and would no doubt have recognised accordingly the infelicity of his expression “reasoning concerning matter of fact”). For to have instead classed (I) as “probable” would have undermined not only his argument concerning induction but his entire theory of knowledge and belief.

Despite the points just made, my claim that (I) should be classified on the “demonstrative” rather than the “probable” side of Hume’s distinction is controversial, because it has commonly been assumed to be definitive of Hume’s “demonstrative” reasoning that it should be entirely *a priori* (Stove 1965 pp.197-8 goes so far as to claim, very implausibly, that the distinction is strictly to be understood *solely* in terms of the “epistemological character of [an argument’s] premises”, quite independently of the argument’s “degree of conclusiveness”). However the only clear evidence given to support this assumption (Passmore 1952, p.20; Stove 1973, p.35) has been Hume’s comments regarding the limited province of “demonstration”, and these are far from decisive.¹⁰ Stove gives five quotations (from A650, A651, E26, E35, and E163) which he interprets as stating “that there can be no demonstrative arguments for any conclusion concerning matter of fact”. But this gloss does not correspond precisely to any of the five, for Hume’s actual words refer not to the possible conclusions of a “demonstrative argument”, but rather to those propositions that can, or cannot, be “demonstrated”, which is something quite different. It is one thing to say, as Hume certainly does, that no “matter of fact” can be demonstrated, or proved demonstratively, or be the object of demonstration; it is quite another to say that a demonstrative argument cannot even be used to deduce one matter of fact from others. Hume never makes this stronger claim, which is just as well since it seems to be inconsistent with at least two passages in Section IV of the *Enquiry* alone (each of which we shall look at again in due course). The first of these is the discussion of “mixed mathematics” at E31, which combines the assertion that physical laws are matters of fact with the observation that “abstract [demonstrative]¹¹ reasonings are employed ... to determine their influence in particular instances”. The second passage is at the heart of the argument concerning induction, where Hume discusses the inference from a past to a future conjunction of cause and effect: both conjunctions are clearly matters of fact, but this does not prevent his canvassing the possibility of a demonstrative argument from one to the other (E34, 98 cf. also Hume’s contemplation of a would-be demonstrative causal inference at T161-2).

Summing up, we have seen good grounds for interpreting Hume’s distinction between “demonstrative” and “probable” reasoning as that, roughly, between what we now call “deductive” and “inductive” reasoning, with the latter being understood in the broad sense which encompasses inference of singular facts as well as of general laws (for additional grounds, see the discussion of Locke in §5 below, note 21 in §6, and §12). Initially in both the *Treatise* and the *Enquiry* Hume explicitly treats his two categories as exhaustive (though he later modifies this policy at T124 and E56 by dividing non-demonstrative reasoning into “proofs” and “probabilities”), and this simple dichotomy implies that the category of “probable” reasoning should theoretically include all non-deductive reasoning, or at least any that is worthy of the name. But in practice Hume takes this category to include just one particular class of reasonings, and these form the topic of his famous argument. Probable reasoning, thus understood, is the kind of reasoning that we employ when we attempt to extend our knowledge by discovering new matters of fact which we have not directly perceived (so it is *ampliative* unlike the merely *analytical* (I)).

¹⁰ No evidence at all is presented by Beauchamp & Mappes (1975) p.123, Beauchamp & Rosenberg (1981) p.43, or Gaskin (1988) p.77, while Stove (1965) pp.197-8 just says that “no other interpretation can survive familiarity with the texts”, and invites the reader to check for himself “with the aid of Selby-Bigge’s analytical indexes” - this from an author who acknowledges that the question is “of fundamental importance” (1973, p.36) and who castigates others for failing to begin “from a really close examination of Hume’s own words” (1965, p.211)! Two things actually revealed by a close examination of Hume’s texts are first, an alternative explanation for the limited province of demonstration (T70-71, E60-61, 163), which has nothing to do with *a prioricity* but is instead based on the absence of precise relationships between non-mathematical ideas, and secondly, his penchant for argument by *reductio ad absurdum*, a form of reasoning that would obviously be quite impossible if demonstrative argument had always to start from *a priori* true premises.

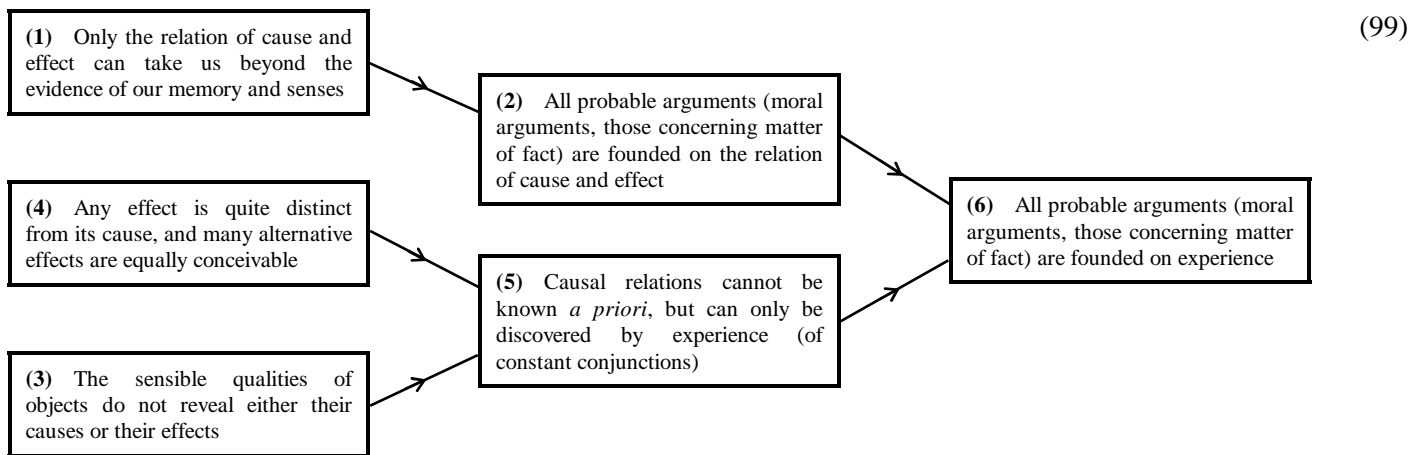
¹¹ The ancestor of this discussion in the *Treatise* makes the same point and apparently equates “abstract” and “demonstrative”, in stating that “Abstract or demonstrative reasoning [sometimes] directs our judgement concerning causes and effects” (T414).

And according to Hume, as we shall see, such reasoning always relies on extrapolation from observed to unobserved, based on the assumption that the two will resemble.

3. “All Probable Arguments are Founded on Experience”

Part i of Section IV of the *Enquiry* is devoted to establishing one fundamental result, that all probable arguments (“moral arguments”, “reasonings concerning matter of fact”) must, if they are to have any force, be based on experience. So part of the answer to Hume’s original query: “what is the nature of that evidence which assures us of any [absent] matter of fact” is that such evidence cannot be purely *a priori*.

The essential structure of Hume’s argument for this result can be represented as follows, with the numbering of the propositions reflecting their textual (and/or logical) order, and the set of arrows to any particular proposition indicating the grounds given by Hume for inferring that proposition (whether or not these grounds are, in fact, adequate - the aim here is to represent the structure of Hume’s argument, not necessarily to endorse it).



This “structure diagram” provides, of course, no more than an idealised outline, since Hume himself does not present his arguments as having any such explicit structure. Indeed it is not easy in Part i to find even a straightforward statement of its conclusion, though proposition (6) is evidently implicit both in Hume’s argumentative procedure and in the summing-up which he gives in the first paragraph of Part ii.¹² Moreover his oft-repeated explicit statements of (2) and (5) are clearly intended to be read together, and Hume apparently sees (6) as such an obvious consequence of these that it does not even need to be stated, except perhaps in passing: “nor can our reason, unassisted by experience, ever draw any inference concerning real existence and matter of fact” (E27); “In vain, therefore, should we pretend to determine any single event ... without the assistance of observation and experience.” (E30).

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Hume’s argument from (1) to (2) is presented very briefly at E26: “All reasonings concerning matter of fact seem to be founded on the relation of *Cause and Effect*. By means of that relation alone we can go beyond the evidence of our memory and senses.” He then proceeds to give some illustrations to substantiate his claim that a “just inference from [facts about] one object to [facts about] another” (T89) can only be based on causation: this relation alone can provide the requisite “connexion between the present fact and that which is inferred from it”, without which any such inference “would be entirely precarious” (E27).¹³

¹² For the summing up, see the beginning of §4 below. Hume’s procedure of arguing for (6) via (2) and (5) is also made clear at E27: “If we would satisfy ourselves, therefore, concerning the nature of that evidence, which assures us of matters of fact, we must enquire how we arrive at the knowledge of cause and effect.”

¹³ Jacobson (1987) claims that this quoted passage from E27 is crucial to understanding Hume’s argument, which she takes to be founded primarily on the two premises that inferences about matter of fact are precarious unless they are mediated by *strongly objective* connexions, and that such connexions cannot in fact be perceived (or legitimately inferred). However it seems dubious to

Having concluded that all probable reasoning is causal, Hume now sets himself to prove that all knowledge of causal relations is *a posteriori*: “I shall venture to affirm, as a general proposition, which admits of no exception, that the knowledge of this relation is not, in any instance, attained by reasonings *a priori*; but arises entirely from experience” (E27). The argument for this proposition, (5) in the structure diagram above, occupies the remainder of Part i. Hume provides two lines of argument for it, the first of which is initially presented using a thought-experiment. Suppose that Adam, just after his creation, and with no previous experience to call on, had been confronted with water and fire - simply from examining their “sensible [i.e. sensory] qualities”, Adam could not possibly have inferred what effects they would have. This illustrates the general proposition (3): “No object ever discovers, by the qualities which appear to the senses, either the causes which produced it, or the effects which will arise from it” (E27). Hume thinks that this proposition, and what he takes to be its immediate consequence (5), appear unsurprising “with regard to such objects, as we remember to have once been altogether unknown to us”, but when an object has been very familiar to us since our birth, “We are apt to imagine that we could discover [its] effects by the mere operation of our reason, without experience.” (E28).¹⁴

To show that this natural assumption is mistaken, Hume employs a second line of argument, summarised in the diagram as proposition (4), which starts with a characteristic challenge: “Were any object presented to us, and were we required to pronounce concerning the effect, which will result from it, without consulting past observation; after what manner, I beseech you, must the mind proceed in this operation?” (E29). He then goes on to claim that the challenge cannot be met: that there is no way in which pure (*a priori*) reason alone can discover causal connexions. For any cause and its effect are logically quite distinct; *a priori* there is nothing in the one to suggest the idea of the other; so that in advance of experience any imagined pairing between causes and effects will appear entirely arbitrary. And even if by luck we happen to guess the correct pairing, so that we succeed in ascribing to some particular cause its actual future effect, nevertheless the conjunction of the two will still appear arbitrary from an *a priori* point of view, “since there are always many other effects, which, to reason, must seem fully as consistent and natural.” (E30).

It is very important to notice that this second line of argument is somewhat different from that with which Hume is commonly attributed, most notably by Stove:¹⁵

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| | (a) | Whatever is intelligible, is possible. |
| | (b) | That the inference from some cause to some effect, <i>prior to</i> experience of the appropriate constant conjunction, should have its premise true and conclusion false, is an intelligible supposition. |
| Therefore | (c) | That supposition is possible. |
| And hence | (d) | The inference from cause to effect, prior to experience, is not one which reason engages us to make. |

base so much on this passage, where Hume seems merely to be expanding on his familiar claim that only the relation of cause and effect can ground an inference to absent matters of fact, a claim made elsewhere (e.g. T73-4, 89) without any mention of connexions in this sense. Her interpretation also seems dubious because such connexions (i.e. powers) make an appearance in the *Treatise* version of Hume’s argument only in what I below call its “coda” (T90-1), where they are clearly introduced as an entirely new consideration which has hitherto played no part. Even in the *Enquiry* Hume’s talk of “connexions” is very non-committal, since both at E27 and at E29 (another passage on which Jacobson relies) he is in fact speaking very guardedly of “supposed” connexions. Any residual temptation to interpret Hume’s arguments in *Enquiry* IV as turning on a strongly objective notion of “connexion” should be removed by the significant footnote at E33n, which refers the reader to Section VII for a “more accurate explication” of “power”.

¹⁴ When Hume denies that causal knowledge can be *a priori*, he seems to mean not only that it requires experience, but that it requires experience *beyond mere perception* of the sensible qualities of the objects concerned. The explanation of this may be that he here individuates kinds of object in terms of their sensible qualities, so that the appearance of any kind of object is already taken for granted when we enquire (even *a priori*) into its causes or effects.

¹⁵ Stove (1973 p.31, cf. Stove 1965 p.194). I have slightly adjusted Stove’s wording to conform to the *Enquiry* presentation of Hume’s argument rather than to those in the *Treatise* and *Abstract* (which speak of “inferring an idea from an impression” etc.).

For Hume, especially in the *Enquiry*,¹⁶ is not stating merely that cause and effect are logically distinct - that the one is conceivable without the other - and concluding that for this reason alone there cannot be a legitimate inference from one to the other. He is starting from a much stronger premise, namely, that *a priori* there is *no discernible connexion whatever* between cause and supposed effect: in advance of experience the conjunction of the two appears “entirely arbitrary”, and the supposed effect is therefore no more “consistent and natural” than any number of alternatives. So Hume’s argument here need not rely, as Stove supposes, on the deductivist assumption that an inference from cause to effect is unreasonable unless the occurrence of the cause without the effect is logically inconceivable. It requires only the far more modest principle that if the inference from cause to effect is to be justifiable *a priori*, then the connection between cause and effect must be at least to some extent non-arbitrary, and an examination of the cause must be able to yield some ground, however slight, for expecting that particular effect in preference to others. In adopting this compelling principle, Hume is not in any way committing himself to the deductivist view, that the only arguments which have any force are those which are logically conclusive.¹⁷

Having completed the principal arguments of Part i, Hume briefly states its conclusion: “In vain, therefore, should we pretend to determine any single event, or infer any cause or effect, without the assistance of observation and experience.” (E30). He then adds two paragraphs spelling out some implications for science in general and for applied mathematics in particular. First, science has absolute limits, in that it cannot possibly uncover the “ultimate springs and principles” of nature: in other words it cannot provide pure rational insight into why things behave as they do. Such insight would require an *a priori* grasp of causal relations, which Hume’s arguments have ruled out, and so the most we can hope for is “to reduce the principles, productive of natural phenomena, to a greater simplicity, and to resolve the many particular effects into a few general causes” (E30). Scientists can continue to search for systematic order in the operations of nature, but they cannot aspire to an ultimate explanation of why things are ordered in the way that they are.

Applied (“mixed”) mathematics might seem to provide an exception to this rule, since it appears to consist of rational deductions from the *a priori* principles of geometry and arithmetic. But Hume points out that any piece of applied mathematics also presupposes certain physical laws, for example the conservation of momentum, and any such law is incurably *a posteriori*. So although *a priori* mathematical reasoning certainly has a part to play in the application of such laws, “to determine their influence in particular instances”, it remains true that “the discovery of the law itself is owing merely to experience, and all the abstract reasonings in the world could never lead us one step towards the knowledge of it” (E31).

4. “All Probable Arguments Presuppose that Nature is Uniform”

The first paragraph of Part ii provides a summary of what Hume takes his argument to have established so far, and the second paragraph announces his intentions for what follows:

... When it is asked, *What is the nature of all our reasonings concerning matter of fact?* the proper answer seems to be, that they are founded on the relation of cause and effect. When again it is asked, *What is the foundation of all our*

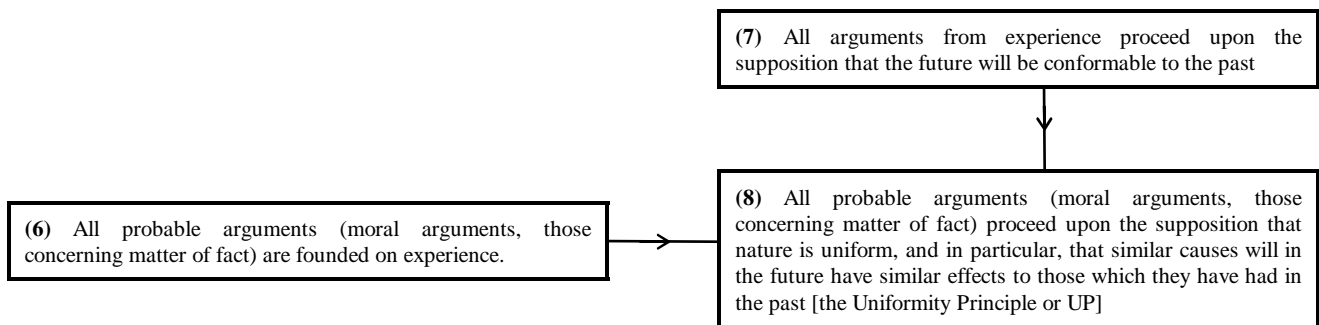
¹⁶ There is an interesting progression in Hume’s thought here. In the *Treatise* his argument does turn largely on mere conceivability, and the suggestion of arbitrariness is relatively muted: “we might ... have substituted any other idea” (T87, cf. T111-2). In the *Abstract* this suggestion is expanded: “The mind can always *conceive* any effect to follow from any cause, and indeed any event to follow upon another” (A650). By the time of the *Enquiry* arbitrariness has clearly become Hume’s principal emphasis, as it remains when he repeats the argument in the *Dialogues*: “every chimera of his fancy would be upon an equal footing” (D145); “he would never, of himself, give a satisfactory account for his preferring one of them to the rest” (D146).

¹⁷ This part of Stove’s case is criticised by Morris on the ground that Hume is here “exclusively and explicitly concerned with deductive forms of argument” (1988, p.56). In fact Hume is *explicit* about this only in the *Abstract* version, but Morris’ point still has force because Hume clearly takes for granted in the *Treatise* too that *a priori* evidence must yield demonstrative certainty, and such an assumption could explain why Hume might be content to argue from mere conceivability at this stage in his argument, without implying any corresponding deductivism about *a posteriori* evidence. The same assumption plays a role in the *Enquiry* version later on (see §7 below), and its importance to Hume’s philosophy is also apparent elsewhere, for example in his well-known search for the impression of necessary connexion (it can explain why he assumes that any would-be *a priori* impression of necessity must yield certain knowledge of causal connexions, but does not make the same demand of an *a posteriori* impression - a puzzle which vexes Craig 1987, pp.93-100).

reasonings and conclusions concerning that relation? it may be replied in one word, Experience. But if we still carry on our sifting humour, and ask, *What is the foundation of all conclusions from experience?* this implies a new question...

I shall content myself, in this section, with an easy task, and shall pretend [i.e. aspire] only to give a negative answer to the question here proposed. I say then, that, even after we have experience of the operations of cause and effect, our conclusions from that experience are *not* founded on reasoning, or any process of the understanding. (E32)

Hume then embarks, in the very long third paragraph, on a slightly unfocused discussion that combines two distinguishable lines of thought, the first of which can be represented as follows:



This part of Hume’s argument is perhaps the least explicit of any, but as we shall see it can nevertheless be “reconstructed” with reasonable confidence on the basis of what he says both before and after it.

The quotation above from the first paragraph of Part ii makes clear that Hume’s motive for investigating arguments from experience is to shed light on the general nature of probable reasoning (reasoning concerning matter of fact and existence) - this will explain the inference from (6) to (8) in the structure diagram. His investigation begins negatively, with a reminder that our experiential reasonings cannot possibly be based on any sensory perception of objects’ “secret powers”. But the positive account soon follows:

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notwithstanding this ignorance of natural powers and principles, we always presume, when we see like sensible qualities, that they have like secret powers, and expect that effects, similar to those which we have experienced, will follow from them. (E33)

That this is indeed Hume’s positive account is made clear by an otherwise puzzling back-reference two pages later, which he makes while summarising this part of his argument, and which cannot sensibly be interpreted as referring to anything else: “We have said ... that all our experimental conclusions proceed upon the supposition that the future will be conformable to the past” (E35). So Hume clearly takes himself to have stated that (7) all arguments from experience, and hence (8) all probable reasonings (since these are all based on experience), “proceed upon the supposition” that nature is uniform: that similar causes will, in the future, have similar effects to those which they have had in the past. Let us call this supposition the Uniformity Principle, or UP for short.

We have here reached the pivot of Hume’s argument. For most of what he has said so far has been devoted to establishing proposition (8) - that all probable reasonings “proceed upon the supposition” of the Uniformity Principle - while most of what follows will be devoted to showing that the Uniformity Principle has no possible foundation in reason or the understanding (for brevity, no “rational justification”). And it is from these two results that Hume draws his famous conclusion that our beliefs in [absent] matter of fact and real existence are “*not* founded on reasoning, or any process of the understanding” (E32).

5. The Uniformity Principle and its Presupposition

In the *Treatise*, the Uniformity Principle and its pivotal role are made far more explicit than in the *Enquiry*:

If reason determin'd us [to make probable inferences], it wou'd proceed upon that principle, *that instances, of which we have had no experience, must resemble those, of which we have had experience, and that the course of nature continues always uniformly the same.* In order therefore to clear up this matter, let us consider all the arguments, upon which such a proposition may be suppos'd to be founded ... (T89)

But this very explicitness has, I suspect, seduced many commentators into misunderstanding both the nature of Hume's Principle and its supposed function within probable reasoning. Indeed it may be that the misinterpretation of this particular passage in the *Treatise* is primarily responsible for the common assumption that Hume is a deductivist. Here Hume claims that probable inferences rationally depend in some sense upon the principle *that unobserved instances must resemble observed instances.* One natural interpretation of this claim is that the Uniformity Principle is (or ought to be) an implicit "middle term" of any such inference, without which the inference would be unjustified. So a probable inference, when fully spelled out, might take the form: 104

- (M) All observed *A*'s have been *B*'s
Unobserved instances must resemble observed instances
∴ Any unobserved *A* is a *B*

Hume's complaint against the rationality of induction then appears as the simple point that the second premise here, the Uniformity Principle, which is needed to provide (in Humean language) a "medium" between the first premise and the conclusion, is unavailable: the principle can itself be given no rational justification, and hence probable inference, which depends on it, is unwarranted. This "unavailable medium" interpretation is not incontestable (cf. T96n, 104), but it apparently derives strong support from what Hume says in the *Enquiry* when discussing the problem of inferring the powers of unobserved objects from those of observed objects: "There is required a medium, which may enable the mind to draw such an inference, if indeed it be drawn by reasoning and argument" (E34); "Where is the medium, the interposing ideas, which join propositions so very wide of each other?" (E37).

However the question now arises what it is about inferences of form (M) which according to Hume renders them justified, in contrast to their allegedly enthymematic and therefore unjustified cousins of the form:

- (E) All observed *A*'s have been *B*'s
∴ Any unobserved *A* is a *B*

Many commentators on Hume have apparently thought the answer to this question too obvious even to require discussion: Hume must believe that (M) is rational and that (E) is not because he takes (M), but not (E), to be deductively valid. So when Hume states that probable arguments are "founded on" (T90), or "proceed upon" (T89, E35), or "suppose, as their foundation" (E37) an assumption of uniformity, what he means is, in Stove's words, that "Inductive arguments are all invalid as they stand, and it would be necessary, in order to turn them into valid arguments, to add to their premises [the Uniformity Principle]" (1973 p.44 cf. 1965 pp.203-4). And this of course would strongly suggest that Hume is, as Stove claims, a deductivist, since he is apparently taking for granted that an argument is reasonable only if it has deductive force, so that anyone who advances an argument which is not deductively valid must either be arguing unreasonably, or else must be presupposing some implicit "middle" premise (or premises) which, when added to the argument, would render it valid. On this account, therefore, Hume is both a deductivist and what we might call a "quasi-deductivist", in that he takes a probable argument to be in effect a disguised deduction, with the Uniformity Principle as a suppressed premise.¹⁸ 105

It is simplistic to assume, however, that the "unavailable medium" interpretation necessarily implies that Hume views the Uniformity Principle as the missing link in an otherwise enthymematic *deduction*. Many have indeed assumed this, but since they have done so without comment this may have been for no better reason than that they associated the notion of a "middle term" (or suppressed premise) with Aristotelian (or modern) formal

¹⁸ A quasi-deductivist interpretation of Hume's argument need not imply, however, that he is himself a deductivist, for it might be thought that he uses it to show the limits of some variety of "rationalism" rather than as an argument *in propria persona*. This approach, which is similar in spirit to that of Beauchamp *et alia* (to be considered in §14), is for example taken by Baier (1991, p.68).

logic, and hence with deductive systems.¹⁹ In the interpretation of Hume, however, such considerations should carry very little weight, because Hume inherited his “logic” more from Locke than from Aristotle, and inherited with it a highly dismissive attitude towards deductive syllogistic theory (see for example E163). When Locke and Hume talk about a “medium”, therefore, we should certainly not assume that they have in mind an exclusively deductive paradigm of inference. Here is Locke defining demonstration and probability (1690, IV xv 1):

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.

“Proof” is Locke’s official term (IV ii 3) for what he elsewhere calls an intermediate idea or a medium (e.g. IV iv 7, IV xvii 15). But there is no suggestion here that these “middle terms” are restricted to demonstrative reasoning: on the contrary, Locke clearly states that the difference between demonstrative and probable reasoning is entirely non-formal, residing not in the presence or absence of “proofs”, but solely in the strength of connexion between the “proofs” concerned. He re-emphasises this point many times, particularly at IV xvii 16:

There are other *Ideas*, whose Agreement, or Disagreement, can no otherwise be judged of, but by the intervention of others, which have not a certain Agreement with the Extremes, but an usual or likely one: And in these it is, that the *Judgment* is properly exercised, which is the acquiescing of the Mind, that any *Ideas* do agree, by comparing them with such probable *Mediums*.

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So Locke is clearly happy with the notion of a “probable medium”, a “middle term” whose connexions with the premise and the conclusion of the argument in which it occurs are less than deductively certain. And given Locke’s manifest influence on Hume (evident for example at T124 and the footnote to E56, where Locke is apparently acknowledged as the primary source of Hume’s initial dichotomy between demonstrative and probable reasoning), this is already sufficient to undermine any case for Hume’s being a quasi-deductivist which is based solely on his demanding a “medium” for inductive inferences.²⁰ More direct evidence to the same effect, moreover, is furnished by Hume’s own texts, most notably a passage in his *Dialogues* (D143, cf. D176), where the *a priori* theist Demea refers to the “mediums” by which the empirical theist Cleanthes endeavours to establish the existence of God, and complains precisely because these mediums are merely probable:

... still less can I approve of the mediums, by which you endeavour to establish [God’s existence and nature]. What! No demonstration of the being of a God! No abstract arguments! No proofs *a priori*! ... Can we reach no farther in this subject than experience and probability?

This passage illustrates that Hume, like Locke, is quite untainted by the now apparently common but always gratuitous assumption that only a demonstrative argument can contain a “middle term”. One might mischievously suggest, therefore, that those commentators who make such an assumption the basis of their interpretation of his argument concerning induction reveal not so much Hume’s deductivist prejudices, but rather their own!

Although we have seen enough to indicate that the quasi-deductivist interpretation is textually and historically unwarranted, it is not yet clear whether there is a coherent alternative account of the supposed logical role of Hume’s Uniformity Principle. Thus, in particular, we have as yet no explanation of why Hume should take for granted that inferences of form (E) presuppose (“are founded on”, “suppose, as their foundation” etc.)

¹⁹ Flew (1961) pp.70-1 certainly seems to be misled by the Aristotelian model. His own exclusive focus on universal inductive arguments (criticised in §2 above), together with Hume’s talk of a “medium”, apparently suggest to him the idea of a syllogism, after which he repeatedly alleges, without any supporting argument, that Hume takes a probable argument to be a “[broken-backed] syllogism” or a “failed deduction” (pp.71-89; cf. Flew 1986, pp.52-5).

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²⁰ Owen (1992) draws a far more radical lesson from Locke’s influence, questioning even whether Hume employed the now standard propositional model of arguments as opposed to the “series of ideas” model suggested by Locke’s words. I have doubts whether the latter is independently significant or even coherent, but in any case Hume’s language in the *Enquiry* (e.g. E34) makes clear that he is very comfortable with the propositional framework, even if he still sometimes lapses into Lockean talk of “interposing ideas” (E37).

such a principle, unless he is after all operating within a deductive paradigm. Two connected issues arise here: first, the kind of presupposition that Hume has in mind; and secondly, the nature of the principle which is according to him thus presupposed. In addressing the first of these, we should be careful at least initially to interpret the notion of “Humean presupposition” as broadly as possible, so as not to prejudge the issue in favour of a deductivist or other narrow interpretation. We can, however, give the notion some specific content by observing its function within Hume’s argument, where he is explicitly concerned with establishing whether or not inductive inferences are founded on reason, and ultimately gives a negative answer on the ground that an alleged presupposition of such inferences is not itself so founded. This suggests that an appropriate sense of presupposition might be spelt out roughly as follows: *an inference (or, in an extended sense, a person who makes that inference) presupposes some proposition if in order for that inference to be rationally well-founded, the proposition in question must also itself be rationally well-founded.* Such an account is indeed desirably broad, for it is consistent with a wide range of different views - including deductivist views - regarding what counts as rational well-foundedness (i.e. having an adequate foundation in reason or “rational justification”). But this provides a sufficient understanding of Humean presupposition to enable us now to enquire into the nature of Hume’s Uniformity Principle by asking the very question to which that principle is intended to provide an answer: what exactly *is* being presupposed in this sense by someone who employs an inference of form (E)?

One modest, and perhaps at first apparently trivial, answer to this question is as follows: when we use an inference of form (E) to extrapolate from observed to unobserved (for brevity, from “past” to “future”), we are presupposing that past instances are *evidentially relevant* to future instances, or in other words, that the nature of past instances gives some evidence concerning the nature of future instances. This is not all, however, for when we make a “probable” inference we suppose that the evidence provided by past instances is *positively* relevant, in that future instances are likely to *resemble* past instances rather than, for example, contrasting with them. Hence any probable inference presupposes that past instances have a *positive evidential relevance* to future instances: this presupposition can very naturally, though loosely, be expressed by saying that *future instances will resemble past instances* (cf. T89), or that *the future will be conformable to the past* (E35), or that *the past is a rule for the future* (cf. E38), and so on. I suggest, therefore, the following interpretation: when Hume claims that probable reasoning presupposes the Uniformity Principle, he is simply making the straightforward point that any probable argument, by its very nature, treats past instances as *positively evidentially relevant* to future instances. This interpretation makes good sense of Hume’s claim and the various ways in which he expresses it, explains why he thought it too obvious to require further elaboration, and is also entirely consistent with his subsequent procedure. For if it is true that any probable argument treats past instances as evidentially relevant to future instances, and if it can be shown that there is no good reason for so treating them, then (at least on the broadly “foundationalist” conception of reason which Hume’s treatment of presupposition shows him to be adopting here - cf. Stroud 1977, pp.60-2) the reasonableness of all probable inference will indeed be undermined. 108

It is a significant virtue of Hume’s argument, interpreted in this way, that it does not commit him to any very specific view regarding either what counts as rational well-foundedness (as we saw above), or what counts as evidential relevance (it is, for example, consistent with the deductivist assumption that the only kind of evidential connexion that carries any force is deductive implication). This means that Hume need give no such hostage to fortune - if his argument succeeds in showing that probable reasoning is not rationally well-founded, then this conclusion can stand even if his own personal theory of evidential relevance (whatever that may turn out to be) is rejected. All this might revive the suspicion that Hume is himself, after all, a quasi-deductivist (and hence very probably a deductivist too), even if he has ingeniously succeeded in insulating his famous argument from these personal weaknesses. But fortunately such a suspicion can be decisively refuted, ironically by turning on its head a criticism that has often been made of him.

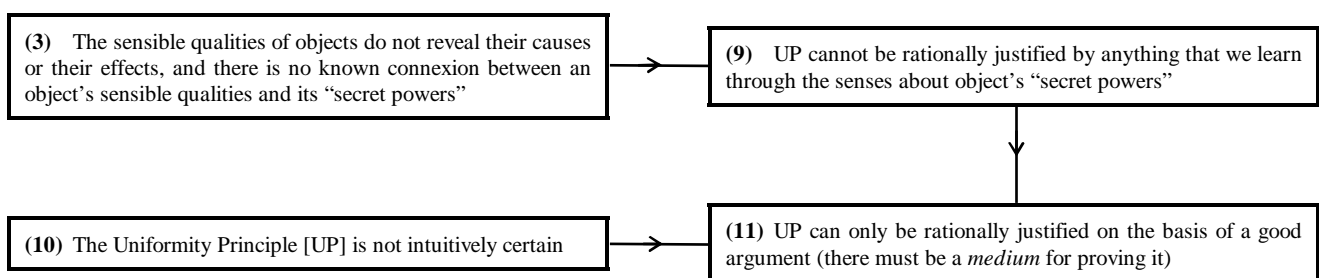
Those who take Hume to be a quasi-deductivist are fond of accusing him of inconsistency or oversight, on the grounds that his proposed Uniformity Principle is actually quite inadequate to fulfil the role that he supposedly requires of it (e.g. Flew 1961, p.74; Stove 1965 p.204; Ayer 1979, p.300). This role demands that the Uniformity Principle be sufficiently strong to transform (at least many) “correct” inductions into deductions - to enable a conclusion about future instances to be drawn deductively from premises which describe only past instances. And it is clearly impossible to satisfy this requirement with the vague formulations of the Uniformity Principle that appear in the *Enquiry*. The more explicit principle of the *Treatise* is perhaps more powerful, at least if interpreted as stating literally *that future instances will resemble past instances in any considered respect*. But then such a principle is far too strong to play the role of legitimating inductive inference, for it is

utterly implausible and has been falsified innumerable times - as for example when the first black swan was observed. The moral is evident: any principle strong enough to transform “correct” inductions into deductions will also be strong enough similarly to transform many “incorrect” inductions, and will certainly therefore be false. Evident this may be, and damning for quasi-deductivism, but it would come as no surprise to Hume, who recognises explicitly that even “good” probable arguments can fail despite what he takes to be the fact that nature is uniform. In Section I iii 15 of the *Treatise*, for example, “Rules by which to judge of causes and effects”, he makes it abundantly clear that inductions are incurably fallible, *even on the supposition that nature is uniform*, since we can never be certain that our past observations have taken all relevant causal factors into account (T175 cf. E86-7). So if he is even minimally consistent in this sort of inductive fallibilism, Hume *cannot be* a quasi-deductivist. (Note however that this does not yet quite settle the question of whether he may be some other kind of deductivist - a task to be completed in §10 below).

6. “The Uniformity Principle can only be Justified by Argument”

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Returning now to the text of Hume’s argument in Section IV of the *Enquiry*, his second distinguishable line of thought in the long third paragraph of Part ii can be represented as follows:



As in Part i Hume emphasises our inability to discern an object’s causes or effects by mere observation of its “sensible qualities”, but here the point of doing so becomes clear only after he has sketched his positive account of experimental reasoning based on the Uniformity Principle:

... there is no known connexion between the sensible qualities and the secret powers; and consequently ... the mind is not led to form such a conclusion concerning their constant and regular conjunction, by anything which it knows of their nature. (E33)

This passage spells out clearly the implication from (3) to (9) as represented in the structure diagram above (though (9) as stated in the diagram makes explicit the contrast which Hume apparently intends between *sensory* knowledge of object’s secret powers, which he here denies, and *inferential* knowledge, which he has not yet ruled out). At this point Hume treats the Uniformity Principle as a straightforward *proposition* “concerning [the] constant and regular conjunction ... between [an object’s] sensible qualities and [that object’s] secret powers”, but he soon goes on to pose the question of its justification in a different way, treating the Principle as something more like a *rule of inference*:

These two propositions are far from being the same, *I have found that such an object has always been attended with such an effect, and I foresee, that other objects, which are, in appearance, similar, will be attended with similar effects*. I shall allow, if you please, that the one proposition may justly be inferred from the other ... But if you insist that the inference is made by a chain of reasoning, I desire you to produce that reasoning. (E34)

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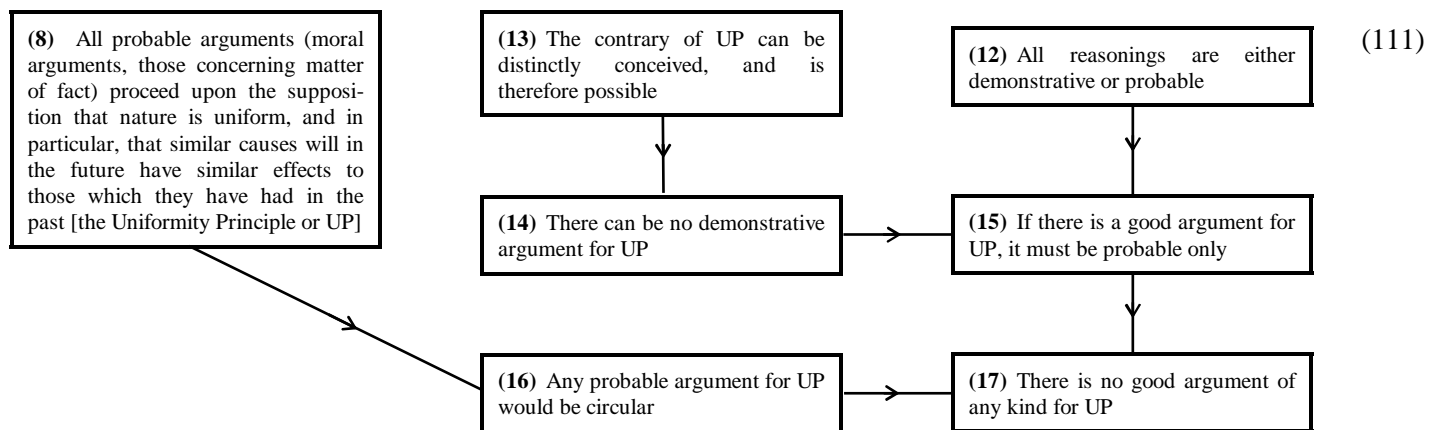
Hume betrays no awareness of any shift in his procedure here, so we must assume that he would draw no distinction between the justification of an inference from *P* (a proposition about past instances) to *Q* (a proposition about future instances), and the justification of the proposition that *P implies Q* (in effect the

Uniformity Principle).²¹ Thus when he immediately continues to say that “The connexion between these propositions is not intuitive. There is required a medium, which may enable the mind to draw such an inference, if indeed it be drawn by reasoning and argument.” (E34), it indeed seems legitimate to interpret this as a comment about the justification of the Uniformity Principle, as represented by the inference from (10) to (11) in the structure diagram above.

7. “There is No Good Argument for the Uniformity Principle”

The stage is now set for the climax of Hume’s argument concerning induction, in which he denies the possibility of any good reasoning at all which could justify the Uniformity Principle and hence provide a rational ground for probable inference. Many commentators have treated this part as though it were virtually the whole of Hume’s argument,²² so it is worth recalling that in the *Enquiry* it is not only preceded by Part i, but is also introduced by the line of thought outlined in §6 above, in which Hume takes the trouble to argue that some reasoning is necessary if the Uniformity Principle is to be justified, a point which he apparently takes more or less for granted in the *Treatise* and *Abstract*.²³

The structure of this most famous part of Hume’s argument is admirably explicit:



It starts with the general claim (12) that “All reasonings may be divided into two kinds, namely, demonstrative reasoning ... and moral reasoning, or that concerning matter of fact and existence [i.e. probable reasoning]” (E35). The inference from (13) to (14) is then quickly drawn:²⁴ “That there are no demonstrative arguments in the case seems evident; since it implies no contradiction that the course of nature may change ... Now whatever is intelligible, and can be distinctly conceived, implies no contradiction, and can never be proved false by any demonstrative argument or abstract reasoning *a priori*”. Propositions (12) and (14) together imply (15): “If we be, therefore, engaged by arguments to put trust in past experience, and make it the standard of our future

(110)

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²¹ It is worth noting in passing the significance of this. If Hume (correctly) draws no fundamental distinction between a proof of Q from P (i.e. $P \rightarrow Q$) and a proof that P implies Q (i.e. $P \rightarrow Q$) then he cannot consistently distinguish between types of argument on the basis merely of the modality of their premises (which as we saw in §2 above is alleged by Stove).

²² Fogelin (1985), for example, calls the entire argument concerning induction Hume’s “no-argument argument” (p.46).

²³ Jacobson (1987) argues that it is Hume’s preliminary line of thought regarding our ignorance of powers which carries his main sceptical thrust, and she accordingly sees his “circularity” argument as a merely secondary move designed to show that the sceptical gap cannot be plugged by justifying the Uniformity Principle. We saw earlier (in note 13) that her interpretation is hard to square with the *Treatise*, but it also seems to misrepresent Hume’s own view of his primary argument in the *Enquiry*, as revealed at E39: “it is not reasoning which engages us to suppose the past resembling the future, and to expect similar effects from causes which are, to appearance, similar. This is the proposition which I intended to enforce in the present section.”

²⁴ This is the only essential use that Hume makes of his “argument from distinct conceivability” in Section IV of the *Enquiry*, since as we saw in §3, Stove is mistaken in seeing it as the sole basis of the inference from (3) to (4).

judgement, these arguments must be probable only". But now the previous conclusion (8) can be appealed to in order to show (16) "that there is no argument of this kind" (E35). For (8) states that all probable arguments presuppose the Uniformity Principle. "To endeavour, therefore the proof of [UP] by probable arguments ... must be evidently going in a circle, and taking that for granted, which is the very point in question." (E35-6).

Though superficially very straightforward, there is a lot going on here beneath the surface. For example, Hume is certainly not being entirely explicit when he states that "all reasonings" are either demonstrative or probable and goes on to rule out the possibility of either type of argument for the Uniformity Principle. For he was surely well aware that philosophers could, and would, concoct various *defective* arguments to support this principle - indeed he considers such an argument himself, at E36-8. What he is denying, therefore, is that any *good* argument is available for the purpose, on the grounds: first, that all *good* arguments are either demonstrative or probable; secondly, that there cannot be a *good* demonstrative argument for the falsity of what is distinctly conceivable; and thirdly, that a *good* probable argument cannot be circular.²⁵ This passage is, in fact, an illustration of a general rule of Hume interpretation, that when he speaks of "all [or no] arguments [reasonings/inferences]", the qualification "good" is usually implicit (see also for example T142, E150, D205).

Hume's grounds for ruling out the possibility of a good demonstrative or probable argument to sanction the inference from past to future also merit some discussion. Here are two candidate arguments, one of each form:

- (D) C's have always been attended with effect E
 All C's have similar effects, no matter when they are observed
 ∴ Future C's will be attended with effect E
- (P) C's have always been attended with effect E
 In the past, similar objects have always turned out to have similar effects
 ∴ Future C's will be attended with effect E

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(D) indeed seems to be a deductively valid argument, and might thus appear to contradict Hume's assertion "that there are no demonstrative arguments in the case". But the contradiction is only superficial, for Hume's interest here is clearly epistemological rather than pedantically logical:²⁶ what he really means to say is that *the inference from past to future cannot be accomplished by means of a demonstrative argument whose additional premises (if any) are already known to be true* - (D) does not qualify as such an argument, because its second "middle" premise cannot be known unless we have already found some way of gaining access to knowledge of future C's. As for (P), Hume would, I believe, acknowledge that this argument is in some sense a "good" probable inference, and would accordingly countenance it in other contexts *as a means of establishing the properties of future C's* (cf. T173-4). The problem is that (P) is useless as an attempt to establish the rational credentials of the Uniformity Principle [UP], for as a probable argument it must itself presuppose this principle, and therefore cannot be used to support it. This circularity can be spelt out on the basis of our earlier analysis of Humean presupposition: an inference such as (P) is rationally well-founded only if UP is rationally well-founded, and it follows that the use of (P) to establish the rational well-foundedness of UP must inevitably "take that for granted, which is the very point in question".²⁷

Given Hume's understanding of "demonstrative" and "probable" reasoning, then, he seems to be quite right to conclude that neither of these can furnish an argument capable of rationally justifying the Uniformity Principle in a non-circular and well-founded manner. But his "no-argument argument" can nevertheless be challenged by resisting his initial assumption (12 in the structure diagram) that "demonstrative" and "probable" arguments,

²⁵ The first of these three points will suffice if the terms "demonstrative" and "probable" are themselves interpreted normatively, so that an argument only *counts as* being of the appropriate type if it is a *good* instance. But Hume himself does not consistently interpret them in this way, and in the *Treatise* especially seems perfectly content to talk of "fallacious" demonstrations (e.g. T53, 80) or "unphilosophical" probable reasonings (T143-55).

²⁶ Hume's disregard for logical precision verges on carelessness when he specifies at E34 the premise and conclusion of the would-be inference discussed here. For he is clearly interested in an inference from the effects of past objects to the effects of future objects, not as his words strictly imply from past personal observations ("I have found ...") to a personal prediction ("I foresee ...").

²⁷ This "presuppositional circularity" differs somewhat from the more familiar "deductive circularity" of an argument whose conclusion is also one of its premises. In this sense, *contra* Stove (1965, p.205), a circular argument need not be deductively valid.

thus understood, are the only two kinds of respectable reasoning available. Hume apparently made this claim not out of dogmatism, but simply because he could not imagine any other legitimate type of reasoning (cf. T90, E36). And anxious as he was to consider all possibilities, he seems to have realised that this might be a weak point in his argument: “there may still remain a suspicion, that the enumeration is not complete” (E39).

To see how a third “species of reasoning” might escape, so to speak, between the horns of Hume’s dichotomy, let us focus on the particular characteristics of demonstrative and probable reasoning that enable him to rule out each of them in turn as a possible source of justification for the Uniformity Principle. First, then, the reason he is confident that no demonstrative argument can do the job is that such an argument always yields total certainty relative to its premises, so the mere distinct conceivability of a change in the course of nature (13) is sufficient to show that the Uniformity Principle cannot be established by demonstration (14) no matter what our premises about the past might be. By contrast, his reason for denying that any probable argument can establish the Uniformity Principle is that all such arguments are founded on experience (7) and that they therefore themselves rely (8) on precisely the kind of extrapolation from past to future that the Uniformity Principle itself is needed to justify; hence any such argument for this principle will be viciously circular (16). Putting these together, it follows that if there were a third form of reasoning which yielded merely probable conclusions (rather than certainties), but did so on *a priori* grounds (rather than by extrapolation from past experience), then this form of reasoning would be completely immune to Hume’s objections: he could not rule out the possibility of such a justification of the Uniformity Principle either on the basis of his argument from distinct conceivability or on the ground of circularity.

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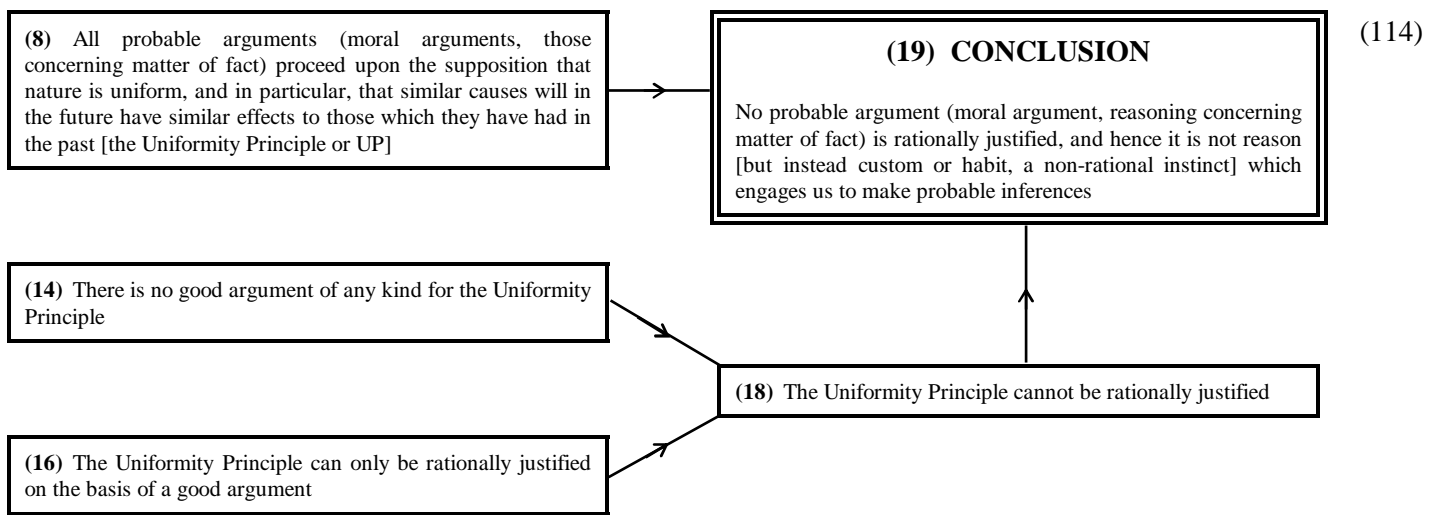
It is highly debatable whether *a priori* probabilistic reasoning (based on so-called “logical probability”) is a genuine possibility or, if it is, whether such reasoning could conceivably provide a justification for the Uniformity Principle. But those who claim that Hume himself showed this particular route to be a dead end are certainly mistaken, for as we have seen, when he denies that “probable” reasoning could perform such a role, Hume has in mind only inductive reasoning from experience, not mathematical probabilistic reasoning that is *a priori*.²⁸ There is, then, a definite gap in Hume’s argument - I personally believe that it can be filled, but this is not the place to attempt such a task.²⁹

8. Hume’s Conclusion: “Probable Inferences are Not Founded on Reason”

As on many other occasions, Hume leaves his reader to slot into place the final pieces of the philosophical jigsaw which he has created. But if the account given above is correct, the way in which they are intended to fit together is evident from the structure and flow of his argument:

²⁸ Indeed it is far from clear whether such reasoning, if it exists, should count as “probable” at all, given that Hume considers *a prioricity* to be almost a defining characteristic of “demonstrative” reasoning (T124, A650, E25).

²⁹ Interesting recent attempts to provide an *a priori* probabilistic justification of induction include Blackburn (1973) ch.7, Mackie (1979), and Clark (1983). I criticise the last two of these in Millican (1982) and (1986) respectively, and hope before long to complete a book which in addition to expanding on the present article will include a general proof that such attempts must fail.



The precise nature of Hume’s conclusion may seem unclear from his own words. We have already seen that he anticipates it when stating his intentions at E32: (113)

I say then, that, even after we have experience of the operations of cause and effect, our conclusions from that experience are *not* founded on reasoning, or any process of the understanding. 114

But when later summing up the section at E39, he expresses his conclusion somewhat differently:

... it is not reasoning which engages us to suppose the past resembling the future, and to expect similar effects from causes which are, to appearance, similar. This is the proposition which I intended to enforce in the present section.

There is a subtle difference here: at E32 he is saying that *our particular experiential conclusions* are not “founded on reasoning, or any process of the understanding”, whereas at E39 he is saying that our supposition of *the Uniformity Principle* is not so founded. If we move forward to the beginning of Section V, however, we can find at E41 a passage which helps to reconcile these two readings:

... we ... conclude ... in the foregoing section, that, in all reasonings from experience, there is a step taken by the mind which is not supported by any argument or process of the understanding.

So all reasonings from experience involve a step, namely the assumption of uniformity,³⁰ which is not supported by “any process of the understanding” - which, indeed, *cannot* be so supported if Hume’s argument is correct. And Hume goes on in Section V to provide an alternative explanation of why we make this step: it is entirely non-rational, and is the product not of reason but merely of a certain brute “natural instinct, which no reasoning or process of the thought and understanding is able either to produce or to prevent” (E46-7). This instinct is what “makes us expect, for the future, a similar train of events with those which have appeared in the past” (E44), and Hume accordingly calls it “custom”, or “habit”. Here, then, is the answer to his original enquiry at E26 regarding “the nature of that evidence which assures us of any [absent] matter of fact”: 115

All inferences from experience, therefore, are effects of custom, not of reasoning. ... Without the influence of custom, we should be entirely ignorant of every matter of fact beyond what is immediately present to our memory and senses. (E43-5)

9. Coda: the Irrelevance of Causal Powers, and a Parting Shot

In both the *Treatise* and the *Enquiry*, Hume’s main argument finishes with his circularity charge against any would-be “probable” justification of the Uniformity Principle. But in both he goes on to refute one natural

³⁰ Unless Hume’s view of the psychological processes involved has changed dramatically since writing the *Treatise*, he does not mean to say that the assumption of uniformity is an *explicit* step in all our inferences from experience. For T104 is entirely unequivocal on the matter: “the understanding or imagination can draw inferences from past experience, without reflecting on [the Uniformity Principle]; much more without forming any principle concerning it, or reasoning upon that principle.”

attempt that might be made to justify induction by appeal to objects' "powers".³¹ In the *Treatise* the way in which Hume introduces this discussion makes very clear its status as an illustration of the scope and force of his argument rather than as an essential part of it:

Shou'd any one think to elude this argument; and without determining whether our reasoning on this subject be deriv'd from demonstration or probability, pretend that all conclusions from causes and effects are built on solid reasoning: I can only desire, that this reasoning may be produc'd, in order to be expos'd to our examination. It may, perhaps, be said, that after experience of the constant conjunction of certain objects, we reason in the following manner. Such an object is always found to produce another. 'Tis impossible it cou'd have this effect, if it was not endow'd with a power of production. The power necessarily implies the effect; and therefore there is a just foundation for drawing a conclusion from the existence of one object to that of its usual attendant. The past production implies a power: The power implies a new production: And the new production is what we infer from the power and the past production. (T90)

The *Enquiry* version of this attempted justification of induction is subtly different, in that instead of apparently using the mere existence of a cause and effect relationship to infer the existence of a power, it takes for granted from the start that objects have powers and appeals to the *constancy* of causal relations to infer a continuing "connexion between the sensible qualities and the secret powers" (E36).³² But the forceful refutation that follows is equally decisive against either version:

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When a man says, *I have found, in all past instances, such sensible qualities conjoined with such secret powers*: And when he says, *Similar sensible qualities will always be conjoined with similar secret powers*, he is not guilty of a tautology, nor are these propositions in any respect the same. You say that the one proposition is an inference from the other. But you must confess that the inference is not intuitive; neither is it demonstrative: Of what nature is it, then? To say it is experimental, is begging the question. For all inferences from experience suppose, as their foundation, that the future will resemble the past, and that similar powers will be conjoined with similar sensible qualities. ... It is impossible, therefore, that any arguments from experience can prove this resemblance of the past to the future, since all these arguments are founded on the supposition of that resemblance. (E37-8 cf. T91)

Here we clearly have a straightforward application of Hume's central argument, rather than a significant independent addition to it. This elegant refutation does, however, help to settle an important issue concerning the relationship between Hume's reasoning about induction and his theory of causation.

In the *Treatise*, as was mentioned in §1 above, Hume's argument concerning induction is presented in the context of his analysis of causation. This can give the impression that the one relies heavily on the other, and many books on Hume have tended to confirm this impression by treating the two together, often within the confines of a single chapter. But the quotation just given shows clearly that Hume's case against the rationality of induction is quite independent of his "regularity" analysis of causation, for even if causation is instead a matter of "secret powers" or "natural necessities", and even if all observed *A*'s have in fact been endowed with the secret power to produce *B*, this in itself can give us no reason for supposing that some hitherto *unobserved A* has been or will be similarly endowed. The point is that because the connection between *A* and that power is not *a priori*, we can only justifiably infer a continued conjunction between them if we already have some justification for extrapolating from observed to unobserved. So an analysis of causation in terms of "secret powers" or "natural necessities" provides no answer whatever to the inductive sceptic.³³

³¹ In the *Enquiry* Hume first presents an additional new argument (but one highly reminiscent of T88 and T163-5) designed to strengthen his claim that the uniformity of causal relations cannot be established *a posteriori* by reason, on the ground that if it could be so established it would be knowable "upon one instance" and not (as we find) only "after a long course of uniform experiments" (E36 cf. E43). The argument is a weak one, and Hume's inability to imagine any kind of reasoning to which numbers of instances would be relevant illustrates his (historically unsurprising) poor grasp of probability theory.

³² This difference is indeed minor, because Hume considers a similar move later in the *Treatise* version at T91 ("Shou'd it be said, that we have experience, that the same power continues united with the same object ..."), and he has anyway already explained at T87 that the very notion of causation involves constancy.

³³ Millican (1986) pp.401-3 extends this train of thought by arguing that since the notion of natural necessity cannot even in principle legitimise induction, this implies that the notion itself is fundamentally incoherent. For if *A necessitates B*, then this should supply some explanatory account of why *B* follows *A*, but a "necessity" which cannot ground an inference to *B* provides no such account, because even if such a necessity is operative the conjunction between *A* and *B* remains at bottom an unexplained coincidence (the coincidence that *A* is conjoined with *the power to produce B*). Hume himself famously maintains that the idea of necessity is incoherent as applied to external objects, since it is an idea derived from an internal impression (T160-66). But the argument just

Since Hume's views about induction do not depend on his own analysis of the notion of causation, this naturally raises the question of why that notion should nevertheless feature so prominently in his famous argument, and whether it plays any essential role there. This question can only be straightforwardly addressed, however, in respect of the *Enquiry*, for in the *Treatise* and *Abstract* both the argument and its conclusion are explicitly presented as being fundamentally concerned with *causal* reasoning rather than with "probable reasoning" or "reasoning concerning matter of fact" (as observed in §1 above). Focusing on the *Enquiry*, then, and appealing to the structural analysis developed above, we can see that causation features importantly in Hume's argument at only two points: first, in Part i, where he uses it as a "middle term" for deducing that all probable reasoning is based on experience (propositions (1) to (6)); and secondly, at the beginning of Part ii, where he appeals again to his earlier claim about our inability to perceive any connexion between objects' powers and their sensible qualities (proposition (3)), and goes on to draw the corollary that the Uniformity Principle cannot be justified on the basis of such perception (proposition (9)). Taking these two together, it seems that causation plays a role in Hume's argument only to the extent of enabling him to conclude *that inferences beyond the present testimony of our memory and senses (including inferences about the Uniformity Principle) cannot be drawn a priori from our immediate perceptions and hence must be based on experience*. However this proposition seems just as plausible in its own right without any mention of causation, and it can moreover be supported directly by most of the examples, and much of the argumentation, that he provides in Part i.

Hume's argument, therefore, can apparently be reconstructed without any essential mention of causation. And Hume himself might have welcomed such a reconstruction, for it would rid him of any dependence on his initial premise (1), about which he seems to have some doubts later in the *Enquiry* when in Section X he turns his attention to inferences based on human testimony. When these doubts arise, it is interesting and perhaps significant that he deals with them in exactly the way that would be required in order to permit such a reconstruction of his Section IV argument, for he makes no attempt to defend this premise, but instead simply remarks that it can be by-passed for his current purposes, on the grounds that any testimonial inference to the unobserved, even if it is admitted to be non-causal, must nevertheless be based on experience:

This species of reasoning, perhaps, one may deny to be founded on the relation of cause and effect. I shall not dispute about a word. It will be sufficient to observe that our assurance in any argument of this kind is derived from no other principle than our observation of the veracity of human testimony, and of the usual conformity of facts to the reports of witnesses. (E111)

This remark is tantalising, but unfortunately we shall probably never know whether Hume ever noticed its relevance to his argument concerning induction. 118

Having completed his "coda", and with it his abstract philosophical arguments for the thesis that probable inferences are not founded on reason, Hume ends Section IV with a relatively down-to-earth parting shot:

It is certain that the most ignorant and stupid peasants - nay infants, nay even brute beasts - improve by experience, and learn the qualities of natural objects, by observing the effects which result from them. ... If you assert, therefore, that the understanding of [a] child is led [to draw conclusions about the future] by any process of argument or ratiocination, I may justly require you to produce that argument ... You cannot say that the argument is abstruse, and may possibly escape your enquiry; since you confess that it is obvious to the capacity of a mere infant. If you hesitate, therefore, a moment, or if, after reflection, you produce any intricate or profound argument, you, in a manner, give up the question, and confess that it is not reasoning which engages us to suppose the past resembling the future, and to expect similar effects from causes which are, to appearance, similar. This is the proposition which I intended to enforce in the present section. (E39)

This is effective rhetoric, but its philosophical significance is less clear, for of course the inductive rationalist is unlikely to claim that infants base their expectations on reason. Rather, he will concede that infants are supplied (by God, perhaps) with appropriate instincts which initially govern their thinking, but he will maintain that these instincts are, or can be, supplanted by reason as that faculty develops. Hume's parting shot, then, has little force unless it is supplemented by other considerations such as the desirability of a simple and uniform theory of all human and animal reasoning. It is therefore worth noting that precisely this point is emphasised by Hume later in

given might provide him with a more reliable route to the same conclusion, because it does not in any way depend upon his dubious theory of ideas.

the *Enquiry*, in the important but relatively neglected Section IX, “Of the Reason of Animals” (itself a descendant of the similarly titled sixteenth and final section of Book I Part iii of the *Treatise*).

10. Stove’s Structural Analysis and Hume’s Alleged Deductivism

We can now put together a complete structure diagram of Hume’s argument as it is presented in Section IV of the *Enquiry* (*Figure 1*). And having done so, our first task must be to highlight and justify its differences from the well-known rival structure diagram (*Figure 2*) devised by Stove (1973), which serves as the foundation of his influential analysis and which according to him provides powerful evidence that Hume is a deductivist. The two diagrams are in some respects hard to compare, because Stove focuses mainly on Hume’s argument as it appears in the *Treatise* and *Abstract*, and intends his diagram to be “a composite photograph” (p.30) of all three versions. So I shall here confine myself to relatively straightforward structural points whose relevance to both diagrams is obvious (using references such as “(8/e)” to signify a Humean proposition which in “translated” form is recognisably common to both). Having criticised Stove’s diagram, I shall then go on to show how the structure of Hume’s argument, so far from indicating that Hume is a deductivist, in fact suggests quite the reverse.³⁴ 119

³⁴ Stove presents his structure diagram as a framework of letters, annotated by a “dictionary” identifying which proposition each letter represents. He gives two such dictionaries, the first (p.31) in Humean language, and the second (p.45) “translated” into modern philosophical terminology. To make the diagram easier to follow I have set out the propositions explicitly within the framework, generally preferring the Humean version (in some cases slightly abbreviated) but adding Stove’s modernising “translations” in square brackets where these are particularly significant. I have also added to the diagram the two alleged suppressed premises which Stove takes to be implicit in Hume’s argument, and the “fallibilist consequence” which is according to him the proper conclusion to draw from it (pp.46-50: Stove’s own diagrams precede his analysis, and accordingly omit what I have labelled (k), (l), (m) and their associated arrows, and represent proposition (j) as being inferred from (g) and (i) directly).

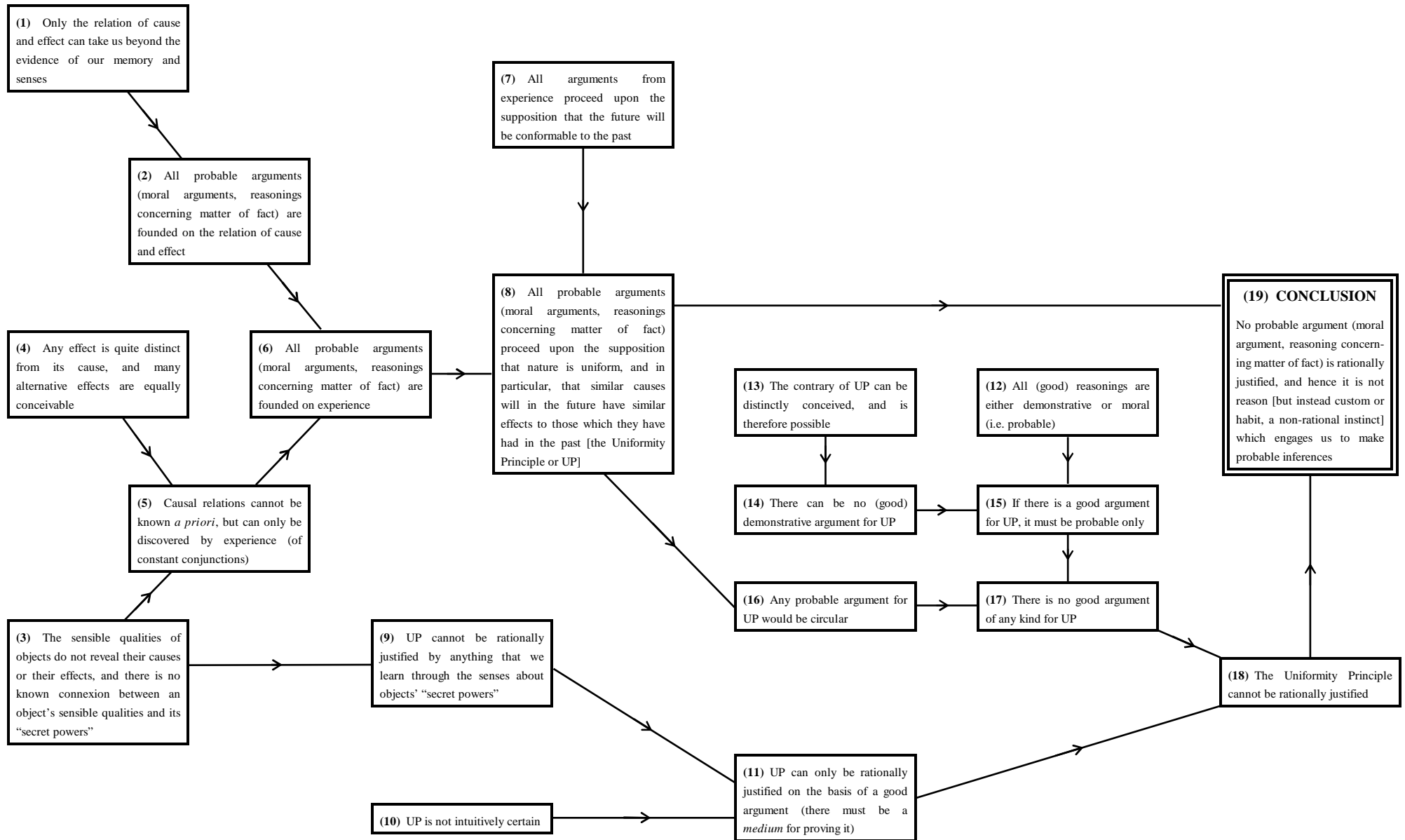


Figure 1 Hume's Argument Concerning Induction (from the *Enquiry Concerning Human Understanding*)

Stage 1

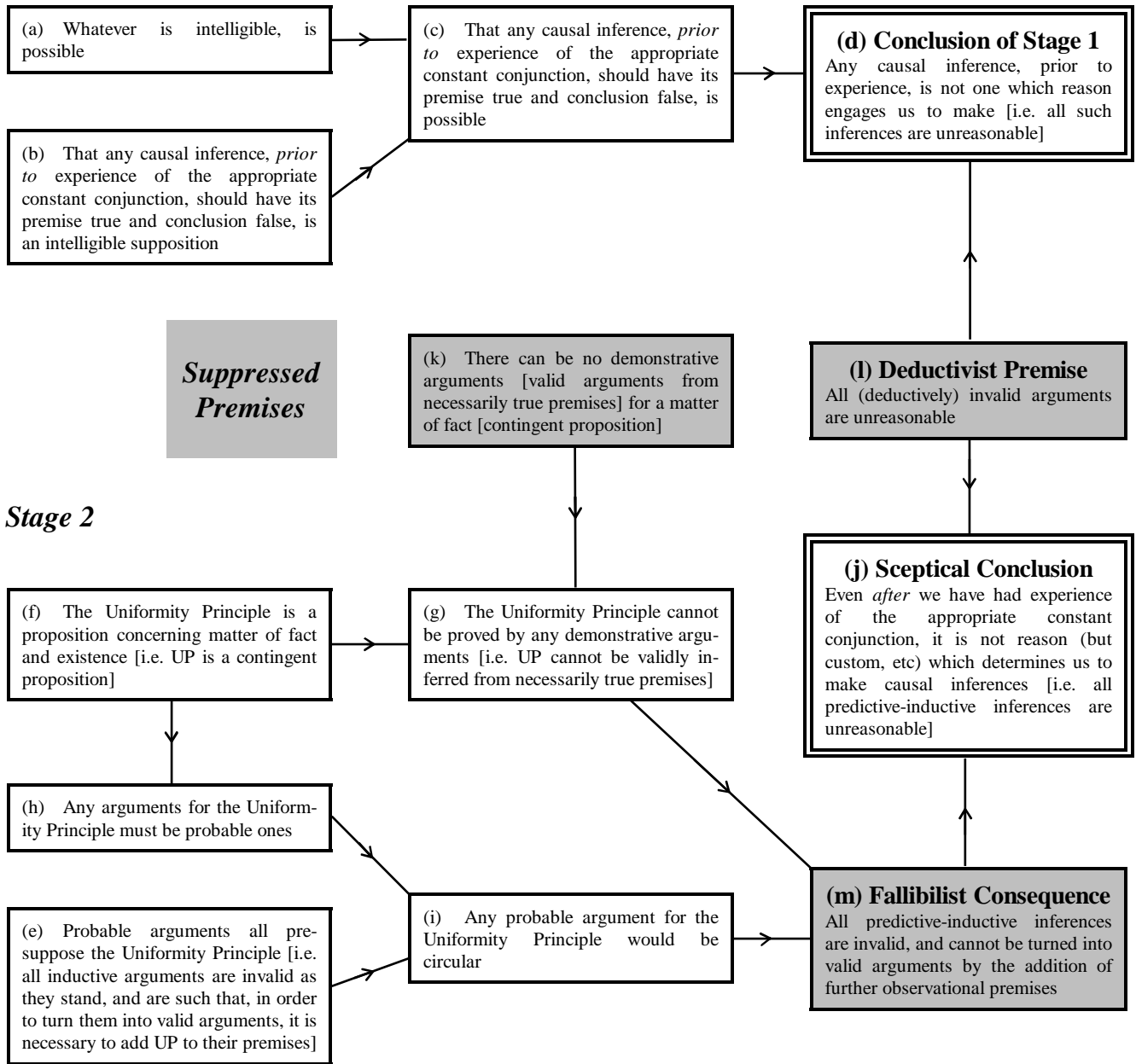


Figure 2 Hume’s argument according to Stove (1973)

Some of the objections to Stove’s analysis are relatively pedantic - for example, that he fails to distinguish consistently between Hume’s talk in the *Treatise* and *Abstract* of inferences “from the impression to the idea” (shortened to “causal inferences” in the diagram) and his subtly different talk of “probable reasoning” (which in those two versions is confined to the discussion of arguments for the Uniformity Principle). Slightly more significant, perhaps, is that Stove completely misrepresents the logical role of proposition (h) as lying on the inferential route from (f) to (i), when in fact (i) clearly follows from (e) alone, and (h) should instead presumably lie between (g) and (m). But the main objection to Stove’s diagram is his wholesale distortion of the overall structure of the argument in his effort to portray it as consisting of two independent stages: in fact, in all three versions *Hume argues for (5/d) only as a means of establishing that causal/probable inferences must be based* (119)

on experience, and he then goes on to use this result as means of arguing for (8/e) and hence for (19/j), his ultimate conclusion.³⁵ So Stove's (d), which he represents as the conclusion of "Stage 1", and his (e), which he represents as a premise of "Stage 2", really both correspond to intermediate steps in Hume's single and thoroughly integrated argument (whose integrated structure is further obscured in Stove's diagram by his failure to indicate the pivotal role of (e) in inferring (j)/(m) from (g)/(h) and (i)).

If Hume's argument does not in fact consist of two independent stages, then Stove's interpretative procedure, of appealing to a supposed parallel between Hume's reasoning for the alleged Stage 1 conclusion and his reasoning for the argument's overall conclusion, is largely undermined (quite apart from the doubts expressed in §3 above concerning Stove's interpretation of "Stage 1" itself). And this is significant, because despite the length at which Stove has written on Hume's argument, this two-stage analysis represents his only major item of evidence for Hume's alleged deductivism which can purport to be grounded independently of other controversial aspects of his interpretation. The other pieces of evidence on which he lays greatest weight (1965 pp.205, 209-10; 1973 pp.43-4) are his deductivist explication of Humean presupposition; his assertion that any circular argument must be valid and hence that at (16/i) Hume must have in mind only valid probable arguments; his explanation of why a deductivist Hume would reject an argument whose presupposition fails; and his general claim to have made sense of the structure of Hume's reasoning. But it is clear that all of these points are highly mutually dependent, and are therefore relatively easy to dismiss all together if a coherent alternative account is available. If the arguments above (especially in §5 and §7) are correct, then there is indeed such an alternative account, and one that is very much more faithful to Hume. Let us now therefore turn back to this account, and put to it the question which Stove puts to his own: does the analysis of Hume's argument which it yields indicate that he is, or is not, a deductivist?

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There are at least two reasons why the argument structure represented in *Figure 1* is hard to square with the supposition that Hume was a deductivist. First, it is obviously a fairly complicated argument, which proceeds by carefully identifying a general presupposition of probable reasoning (8), and then systematically eliminating all the potential sources of rational support for this presupposition ((9), (10), (14), (16)). But if Hume were indeed a deductivist, then such a complicated structure would be entirely unnecessary, for a deductivist recognises only one degree of rational support, namely deductive certainty, and Hume is well aware that such certainty can be ruled out directly with his argument from distinct conceivability - he uses it himself for just this purpose at stage (13). Stove, as we have seen (§3), interprets Hume as deploying another version of this argument earlier on, at stage (4). But he completely fails to observe that a small adaptation of this version would have been quite sufficient to give a deductivist Hume a "hole in one", reaching his final conclusion (19) with a minimum of effort:

- (a) Whatever is intelligible, is possible.
- (b) That any inference from observed to unobserved should have all its premises true and conclusion false, is an intelligible supposition.
- Therefore (c) That supposition is possible.
- And hence (d) No inference from observed to unobserved is one which reason engages us to make.

It is hard to believe that an argument so straightforward, obvious, and Humean in spirit (cf. E164, D189) would have evaded the great sceptic's scrutiny if it had been sufficient for his purpose.

The second reason for rejecting a deductivist interpretation of the argument in *Figure 1* is related to the first, and concerns Hume's procedure when examining the potential sources of inferential justification for the Uniformity Principle. With proposition (12) he states that all reasonings are either demonstrative or probable, and he goes on to rule out each of these in turn as providing a possible rational basis for the Uniformity Principle. But the crucial question is this: if Hume is a deductivist, and accordingly assumes from the start that only

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³⁵ Passages making relatively explicit the inference from (5/d) to (8/e) are T87 "'Tis therefore ... past experience" and T88-9 "Since it appears ... uniformly the same"; A651 "It would have been ... uniformly the same"; E35-6 "We have said ... point in question".

demonstrative reasonings are rational, then why does he even consider the possibility that probable reasoning might justify the Uniformity Principle? From the point of view of a deductivist, a probable justification is no justification at all. The fact that Hume is prepared to canvass such a justification, even though he of course ultimately rules it out on the grounds of circularity, very strongly suggests that he was no deductivist.

11. Stove's Probabilistic Interpretation of Hume's Conclusion

We have by now seen ample reason to reject Stove's analysis of Hume's argument, but this in itself does not imply that we can reject his formal interpretation of Hume's conclusion, which he works out (1973 pp.53-62) somewhat independently of his earlier analysis. This interpretation has, moreover, provided the basis of a number of would-be "refutations of inductive scepticism" (Stove 1973, 1986; Gemes 1983), and is therefore worth considering in its own right. Stove starts from the assumption (argued earlier in his book at pp.33-4) that Hume's conclusion can be paraphrased as "All predictive-inductive inferences are unreasonable", and he takes this to mean that in any predictive-inductive inference the premises (which concern observed objects) provide no support whatever for the conclusion (which concerns unobserved objects). This claim Stove interprets as a probabilistic "judgement of irrelevance" (p.59) - a judgement that the existence of "past" (i.e. observed) objects which satisfy some condition in no way affects the probability that "future" (i.e. unobserved) objects will also satisfy that condition. If we restrict our attention to a particular condition, F , one past object, a , and one future object, b , then such a judgement of irrelevance of the past to the future ("IPF") can be expressed formally as follows:³⁶

$$P(Fb/Fa) = P(Fb) \qquad \text{IPF}$$

That is, *the probability that Fb is true given that Fa is true* is exactly the same as *the initial probability that Fb is true* (the latter signifying the probability that Fb is true in advance of observing that Fa is true). This indeed seems a reasonable way of expressing Hume's "judgement of irrelevance" in probabilistic terms, if that is one's aim.³⁷

Stove however extends this interpretation by stating that Hume (although he "never discusses explicitly ... *universal-inductive inferences*", p.28) obviously "intended the sceptical conclusion which he drew about predictive-inductive inferences to be drawn also about universal-inductive ones" (p.61). Stove accordingly takes Hume's conclusion about universal-inductive inferences to be also a simple judgement of irrelevance, and if we again restrict ourselves to our two-object universe, he takes this to have the implication that according to Hume the probability of the "universal" proposition ($Fa \ \& \ Fb$) is in no way affected by the observation of Fa . Let us call this particular judgement of irrelevance "Hume's Inductive Scepticism according to Stove", or "HISS" for short.

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$$P(Fa \ \& \ Fb/Fa) = P(Fa \ \& \ Fb) \qquad \text{HISS}$$

Stove's "refutation" of Hume involves a formal proof that where F is an empirical predicate which might or might not apply to each of the objects a and b individually, HISS has implications which are clearly unacceptable both to the inductivist and to the inductive sceptic. This proof he dignifies with the name of "von Thun's argument" (p.68).

Von Thun's argument is unnecessarily complicated, extending over an entire page and using four "principles of logical probability" together with two inequality statements each of which asserts that some contingent proposition has initial probability less than 1. Two of the principles used in the argument are the Equivalence Principle, which states "that logically equivalent propositions can be substituted for one another *salva*

³⁶ I have simplified Stove's exposition here, for example by omitting all references to "tautological" evidence.

³⁷ Particularly in view of the discussion in §7 above, it must remain highly debatable whether Hume would have accepted the controversial notion of "logical probability" which Stove here presupposes. Nevertheless it is, I believe, worth seeing how far Hume's position can be explicated within such a framework. For a broadly Humean sceptical view of logical probabilities see Ayer (1979).

probabilitate in statements and in principles of logical probability”, and the Conjunction Principle, which states that for any propositions q and r , $P(q \& r) = P(q) \times P(r/q)$. There is in fact a much simpler way of showing that HISS is unacceptable to both inductivist and sceptic, in a mere three steps and using only these two principles:

$$\begin{aligned}
 P(Fa \& Fb/Fa) &= P(Fa \& Fb) && \text{HISS} \\
 &= P(Fa \& (Fa \& Fb)) && \text{Equivalence Principle} \\
 &= P(Fa) \times P(Fa \& Fb/Fa) && \text{Conjunction Principle} \\
 \therefore \text{ Either } P(Fa \& Fb/Fa) &= 0 \text{ or } P(Fa) = 1 && \text{Arithmetic}
 \end{aligned}$$

To accept this conclusion would be to embrace either a wildly implausible counter-inductivism, or an equally absurd claim to *a priori* knowledge of the supposedly empirical proposition Fa . So HISS is indeed refuted.

The fact that HISS can be so easily refuted might prompt the suspicion that it is not after all a legitimate extension of the relatively innocuous IPF. And this suspicion would be well-founded, for whereas IPF represents a judgement of irrelevance of a past proposition Fa to a purely future proposition Fb , HISS represents a far less plausible judgement of irrelevance, of a past proposition Fa to a past-and-future proposition $(Fa \& Fb)$ which, so to speak, *overlaps with* Fa (i.e. the truth of the “premise” Fa already implies that the “conclusion” $(Fa \& Fb)$ is partially fulfilled). Someone who accepts HISS is, for example, committed to saying that if I am playing backgammon and throw one of my two dice before the other, the proposition that *the first die lands showing a “6”* has no impact whatever on the probability of the proposition that *after the second die has landed the two dice together will have shown two “6”s*. This is manifestly absurd on any account, and is certainly not a logical extension of IPF as Stove appears to believe. His *only* ground for viewing it in this way, as we have seen, is his claim that Hume “intended the sceptical conclusion which he drew about predictive-inductive inferences to be drawn also about universal-inductive ones”, but as an argument for a particular formal interpretation of Hume this is quite feeble. For the judgement of irrelevance IPF instantiates more than one probabilistic schema, and it can therefore be generalised to other instances in more than one way. Stove (p.61) chooses to see it as an instance of the schema:

$$(S1) \quad \text{If } E \text{ and } H \text{ are such that the inference from } E \text{ to } H \text{ is inductive, then } P(H/E) = P(H)$$

But he gives no reason at all for preferring this very simplistic schema (which would however be significantly less simple when supplemented with a definition of “inductive”) to other possibilities, such as the only slightly more complicated:

$$(S2) \quad \text{If } O \text{ and } E \text{ logically imply no unobserved matter of fact, and } H \text{ logically implies no observed matter of fact, then } P(O \& H/O \& E) = P(H)$$

This separates out the “observed” (O) and “unobserved” (H) components in the conclusion of any inductive argument, and reduces to Stove’s (S1) where O is merely tautologous: it thus indeed subsumes IPF (with O tautologous, E substituted by Fa and H substituted by Fb). But in providing an assessment of the probability $P(Fa \& Fb/Fa)$, instead of yielding the preposterous result HISS it generates instead (with O substituted by Fa , E tautologous and H substituted by Fb) the far more Humean $P(Fa \& Fb/Fa) = P(Fb)$. It likewise generalises quite easily to all “predictive-inductive” and “universal-inductive” arguments, enabling us to express “the same sceptical conclusion about all of them” without running into any obvious absurdities. As a probabilistic schema of inductive scepticism it is vastly more plausible than Stove’s, for not only does it express quite straightforwardly the irrelevance of the observed to the unobserved - it is also, I believe, just as irrefutable as inductive scepticism itself.

12. Is Hume an Inductive Sceptic?

Having now seen in (S2) a relatively precise statement of what extreme inductive scepticism amounts to - namely the total evidential irrelevance of observed to unobserved - it is appropriate to ask whether this can properly be

seen as the substance of Hume's own conclusion, which he certainly expresses in apparently sceptical language: "... '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). Clearly too my above analysis of Hume's famous argument suggests a sceptical reading, for it treats that argument as pivoting around the Uniformity Principle, which it takes to be essentially a statement of evidential relevance whose rational credentials are then examined and apparently found wanting. Further seemingly strong textual support for the traditional sceptical interpretation 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 this extreme scepticism 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 fundamentally, with the general thrust of his empiricist philosophical project. Here first are some quotations that are at least problematic for the traditional interpretation:

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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.³⁸ 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

³⁸ 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)

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. 129

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 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. 130

13. 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 (or ways), 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)

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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:³⁹

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)

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, because 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 defines a *restricted* sense of “the imagination”, according to which that faculty includes only the epistemologically less respectable mental operations, and this restriction implies that probable reasoning must be relocated instead into the province of the understanding, whose scope is thereby *extended*. Hume does not quite explicitly acknowledge this implication from a restriction of the one faculty to an extension of the other, but he nevertheless plainly endorses it, for the very same sentence which spells out the restricted sense of “imagination” begins by making clear that its whole point is to “oppose [the imagination] to reason”. The upshot of all this is that Hume has implicitly specified a third sense of “reason” intermediate between the neutral and rigorous senses, which includes within its domain both demonstrative and probable inference, but excludes the less respectable operations of the mind that he elsewhere describes as “deceitful”, “fallacious”, and “blundering”. In this new intermediate sense, therefore, “the understanding” overlaps with what he had previously called “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 having inserted his clarificatory footnote Hume can speak somewhat misleadingly, but now without blatant self-contradiction, of “the understanding, that is, ... the general and more establish'd properties of the imagination” (T267).

This new intermediate sense of “reason” provides the resolution of our puzzle regarding Hume’s apparently ambivalent attitude towards induction, for it is in this sense that he unequivocally takes (suitably disciplined)

³⁹ 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.

probable inferences to be entirely rational. But this superficially non-sceptical position seems completely insubstantial if its only basis is a stipulative extension 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 amongst those operations.

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, irresistible, 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 irresistible, 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, 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. 134

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,⁴⁰ 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) 135

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

⁴⁰ In the *Enquiry* Hume dismisses extreme “antecedent” scepticism (E149-50) on the straightforward ground that such thoroughgoing Cartesian doubt about one’s own faculties would be paralytically incurable. He also somewhat downplays his sceptical arguments regarding 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”.

14. “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 “rationalist” sense of reason, invoked only for the purpose of showing how utterly impotent it is, so that such 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* demonstrative sense, and is adopted only in order to be dismissed.

There are two main difficulties for this sort of interpretation, both of which we have encountered before. First, we saw in §10 that the argument concerning induction is hard to make sense of in deductivist terms, and this point applies just as much whether or not the sense of “reason” to which it appeals is supposed to be genuinely Humean. To repeat: 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. 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 (stage (6) of the argument) that probable reasoning cannot be *a priori*. 136

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 seen in §12 some of the most explicit statements of his position, but the quotation from T139 is worth repeating in context:

Let men be once fully perswaded 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.

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”? As we saw in §8 above, this conclusion can be elucidated as the claim that 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). So what we seek is an interpretation of “the understanding” which would make this at the same time a 137

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.

We have already seen (in §5 above) the definition with which Locke begins the chapter "Of Probability" in Book IV of his *Essay*. 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) respectively), maintaining that none of them can provide any intellectual ground for that 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 clearly 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. 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).⁴¹

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The original version of this paper (which has since been slightly amended) was published in *David Hume: Critical Assessments*, edited by Stanley Twyman, Routledge 1995, volume 2, pp. 91-144. The marginal numbers refer to the page breaks from this edition. Footnotes appeared there as endnotes, with numbers 1 to (most of) 3 on page 138, 4 to 10 on page 139, 11 to (most of) 17 on page 140, 18 to (one line of) 27 on page 141, 28 to (most of) 34 on page 142, and 35 to 41 on page 143. References started at the bottom of page 143, and occupied all of page 144.

For convenience, the main structure diagram is presented again on the following page, with a key to the corresponding passages from Hume's text (this key did not appear in the original article).

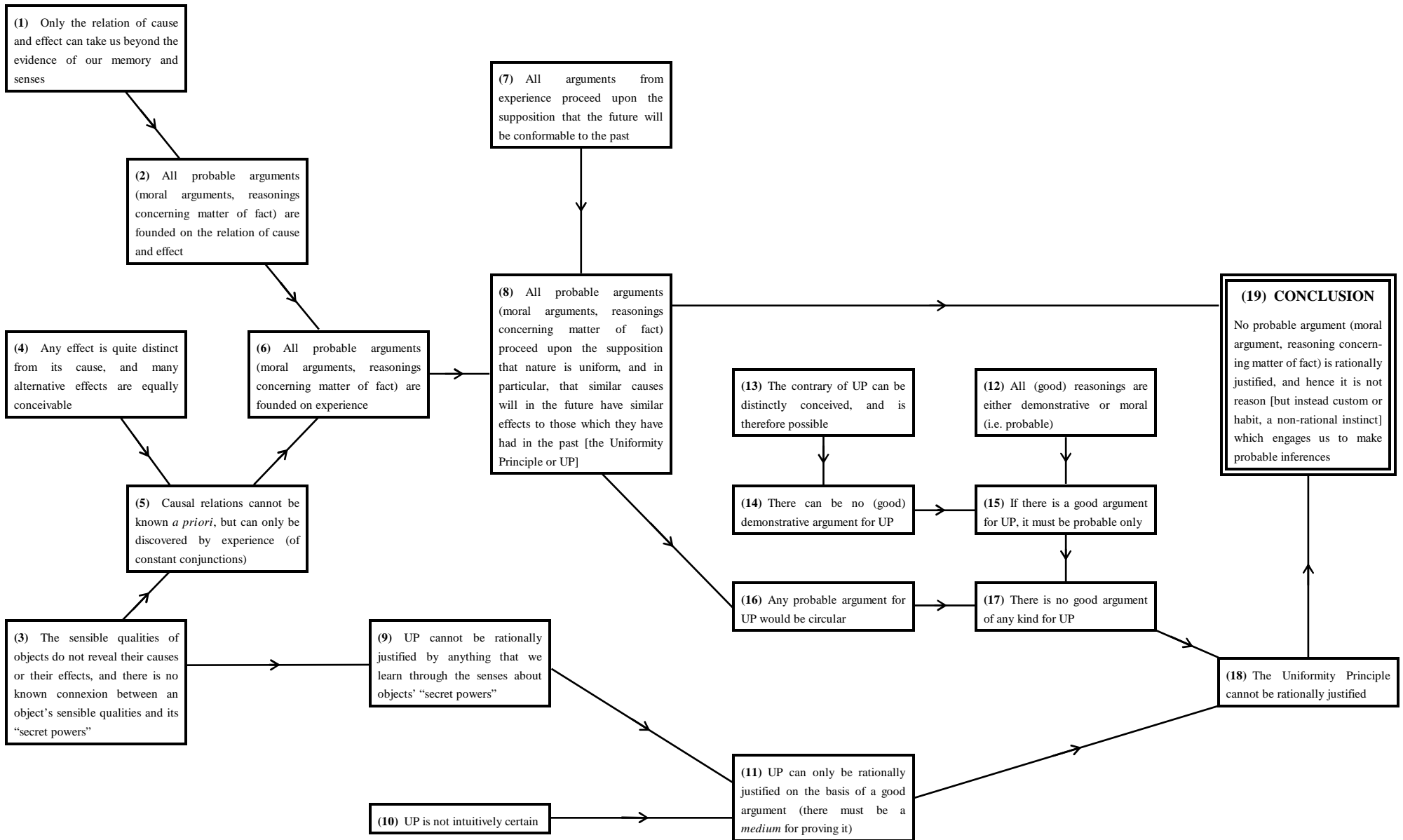


Figure 1 Hume's Argument Concerning Induction (from the *Enquiry Concerning Human Understanding*)

- (1) E26: “By means of [*Cause and Effect*] alone can we go beyond the evidence of our memory and senses.”
- (2) E26: “All reasonings concerning matter of fact seem to be founded on the relation of *Cause and Effect*.”
E35: “all arguments concerning existence are founded on the relation of cause and effect”
E159: “all our evidence for any matter of fact, which lies beyond the testimony of sense or memory, is derived entirely from the relation of cause and effect”
- (3) E27: “No object ever discovers, by the qualities which appear to the senses, either the causes which produced it, or the effects which will arise from it”
E33: “It is allowed on all hands that there is no known connexion between the sensible qualities and the secret powers”
- (4) E30: “every effect is a distinct event from its cause. It could not, therefore, be discovered in the cause, and ... the conjunction of it with the cause must appear ... arbitrary; since there are always many other effects, which, to reason, must seem fully as consistent and natural.”
- (5) E27: “the knowledge of [cause and effect] is not, in any instance, attained by reasonings *a priori*; but arises entirely from experience”
E28: “*causes and effects are discoverable, not by reason but by experience*”
E30: “In vain, therefore, should we pretend to ... infer any cause or effect, without the assistance of observation and experience.”
- (6) E27: “nor can our reason, unassisted by experience, ever draw any inference concerning real existence and matter of fact”
E30: “In vain, therefore, should we pretend to determine any single event ... without the assistance of observation and experience.”
- (7) E33: “we always presume, when we see like sensible qualities, that they have like secret powers, and expect that effects, similar to those which we have experienced, will follow from them”
E35: “We have said that ... all our experimental conclusions proceed upon the supposition that the future will be conformable to the past”
E37: “all inferences from experience suppose, as their foundation, that the future will resemble the past, and that similar powers will be conjoined with similar sensible qualities”
- [8] E35: “We have said that all arguments concerning existence are founded on the relation of cause and effect; that our knowledge of that relation is derived entirely from experience; and that all our experimental conclusions proceed upon the supposition that the future will be conformable to the past.”
- (9) E33: “the mind is not led to form such a conclusion concerning [sensible qualities and secret powers] constant and regular conjunction, by anything which it knows of their nature”
- (10) E34: “The connexion between these propositions [*I have found that such an object has always been attended with such an effect and I foresee, that other objects, which are, in appearance, similar, will be attended with similar effects*] is not intuitive.”
- (11) E34: “There is required a medium, which may enable the mind to draw such an inference, if indeed it be drawn by reasoning and argument.”
- (12) E35: “All reasonings may be divided into two kinds, namely, demonstrative reasoning, or that concerning relations of ideas, and moral reasoning, or that concerning matter of fact and existence.”
- (13) E35: “It implies no contradiction that the course of nature may change ... may I not clearly and distinctly conceive [such a thing]?”
- (14) E35: “That there are no demonstrative arguments in the case seems evident”
E35: “whatever is intelligible, and can be distinctly conceived, implies no contradiction, and can never be proved false by any demonstrative argument or abstract reasoning *a priori*”
- (15) E35: “If we be, therefore, engaged by arguments to put trust in past experience, and make it the standard of our future judgement, these arguments must be probable only, or such as regard matter of fact and real existence”
- (16) E35-6: “To endeavour, therefore, the proof [that the future will be conformable to the past] by probable arguments, or arguments regarding existence, must be evidently going in a circle, and taking that for granted, which is the very point in question.”
- (17) E35: “it may be requisite ... to show that none of [the branches of human knowledge] can afford such an argument”
E159: “we have no argument to convince us, that objects, which have, in our experience, been frequently conjoined, will likewise, in other instances, be conjoined in the same manner”
- (18) E39: “it is not reasoning which engages us to suppose the past resembling the future, and to expect similar effects from causes which are, to appearance, similar”
E159: “nothing leads us to [expect constant conjunctions to continue] but custom or a certain instinct of our nature”
- (19) E32: “I say then, that, even after we have experience of the operations of cause and effect, our conclusions from that experience are *not* founded on reasoning, or any process of the understanding.”
E43: “All inferences from experience, therefore, are effects of custom, not of reasoning”
E46-7: “All belief of matter of fact or real existence [is due merely to] a species of natural instincts, which no reasoning or process of the thought and understanding is able either to produce or to prevent.”

Hume's Statement of the Stages of the *Enquiry* Argument