Hume's epistemology

- the distinction between relations of ideas and matters of fact.
- the nature of causal or matter of fact reasoning (the problem of induction)

Hume's epistemology (1): matters of fact and relations of ideas (*EHU* section 4; part 1)

The first thing to notice about Hume's epistemological investigations in Section Four of the *EHU* is that he does not start as many philosophers do with a conceptual analysis of knowledge. In other words, Hume does not start by asking what knowledge is as such. Rather Hume starts by drawing a fundamental distinction between two forms of what is obviously already knowledge. This makes it clear that Hume's scepticism is not so radical as to bring into question the very existence of knowledge; rather at this stage Hume is simply concerned to delimit the scope of our claims to knowledge by insisting that all knowledge must be one of two sorts:

> All the objects of human reason or enquiry may naturally be divided into two kinds, to wit, *Relations of Ideas* and *Matters of Fact*. (*EHU*4:1)

What Hume attempts here is to distinguish between two forms of enquiry and the two correlative objects of those enquiries - for Hume there are only two sorts of thing we can justifiably enquire about: relations of ideas and matters of fact.

Hume's fork: Distinguishing relations of ideas and matters of fact

Relations of Ideas are the proper object of the mathematical sciences (geometry, algebra, arithmetic). Examples include the claims (propositions) *that* the square of the hypotenuse (of a triangle) = the square of the two sides; and *that* 3x5 = 30/2. Matters of fact are the proper object of the empirical sciences (physics, chemistry, biology) Examples include the claims *that* the sun will rise tomorrow; and *that* all swans are white.

Table 1: Examples

Relations of Ideas	*Matters of Fact*
2 + 2 = 4	The number of planets in our solar system = 9
All bachelors are unmarried men	All ravens are black
If all men are mortal and David Cameron is a man, then David Cameron is mortal.	If John Smith hadn't died Tony Blair wouldn't be Prime Minister.

Of course we need to articulate what the various examples of each type have in common. Now looking at Hume's quotation it is clear that he has a number of different criteria in mind. Hume distinguishes relations of ideas and matters of fact in terms of:

- their relative degrees of certainty.
- how we come to know them.
- whether their contrary or negation implies a contradiction.

Now we can be more precise than Hume by separating out these three different criteria. The basis for the separation between these different criteria is that we need to distinguish between:

- *what* we know (the *objects* of knowledge)
- *how* we come to know these things (the *modes* of knowing)
- how we *talk about* what we know (*expressions* of knowledge).

In more modern terminology, what we say is that there is

- a metaphysical or ontological distinction
- an epistemological distinction
- a logical or semantical distinction.

A metaphysical distinction

The metaphysical distinction is between two different sorts of *fact*:

- *necessary* facts
- *contingent* facts.

A contingent fact is a fact that *could have been otherwise*. A necessary fact is a fact that *could not have been otherwise*. It is for example a contingent fact that David is six foot tall - it is contingent because he could easily have been longer or shorter (perhaps his genetic makeup might have been different or he might have suffered from some illness when a child). While it is a necessary fact about David that he be some size or other - it is necessary because David could not fail to be any size whatsoever.

An epistemological distinction

The epistemological distinction is between

- *a posteriori* knowledge
- *a priori* knowledge.

We say that something is known *a posteriori* if it can only be known through observation or empirical investigation. We say that something can be known *a priori* if it can be known through, as Hume puts it, 'the operations of thought alone'; that is to say, without observing anything. Here examples are straightforward: we can only know how many people there are in a room by checking, that is to say by observing; so we say we know this fact *a posteriori*. But we know

mathematical facts without checking, that is to say, we say we know that 2+2=4 without ever having gone out into the world and actually checking; hence we say we know that 2+2=4 *a priori*.

A semantic distinction

The final distinction is logical or semantic. This concerns not what we know or how we know it but rather what we *say* about what we know. Here the distinction is between

- *analytic* statements.
- *synthetic* statements.

A synthetic statement is a statement whose truth or falsity depends in some way on how the world is; for instance; the statement "David Cameron is prime minister" is synthetic because its truth is dependent upon the world being how it actually is. The truth of an analytic statement on the other hand is in no way dependent upon how the world is; for example, the statement "all bachelors are unmarried men" or "all vixens are female foxes". These statements are true by definition, that is to say true solely in virtue of the meaning of the words used - these aren't statements that we have to check up on.

Hume's principle

With these distinctions in place we can return to Hume to make his distinction between relations of ideas and matters of fact more precise.

- For Hume all relations of ideas are necessary facts, expressed by analytic statements and known *a priori*; while all matters of fact are contingent facts, expressed by synthetic statements and known *a posteriori*.

Table 2: Hume's position

	Relations of Ideas	*Matters of Fact*
Epistemological	A Priori	A Posteriori
Semantical	Analytic	Synthetic
Metaphysical	Necessary	Contingent

The question that concerns us is whether Hume's distinction is adequate - are the two possible combinations of metaphysical, epistemological and semantic criteria the only two possible ones. Philosophers since Hume have thought not. While certainly there are some impossible combinations others seem not only possible but likely.

Table 3: other possibilities

	A Priori	*A Posteriori*	*Analytic*	*Synthetic*	*Necessary*
Contingent	**?**	√	**?**	√	X
Necessary	√	**?**	√	**?**	
Synthetic	**?**	√	X		
Analytic	√	**?**			
A Posteriori	X				

Two philosophers who have suggested that we can identify propositions that lie outside Hume's taxonomy are Kant and *Saul Kripke*. In his greatest work the *Critique of Pure Reason* Kant suggested that there are a number of propositions – in geometry and philosophy for instance – that are *synthetic a priori*.

. . . .

Hume's principle of philosophical significance

Recall that in the course of section two Hume in effect introduced a criterion not only of philosophical significance but significance (or meaning) in general: every idea has to has its basis in a corresponding impression – no impression, no idea. This was the basis of a criterion of philosophical significance inasmuch as it placed a constraint on which concepts we could deploy in our philosophical explanations: every such concept must have a corresponding impression. The search for impressions became perhaps the primary task of philosophy for Hume. Here in section four Hume offers us a further constraint on our philosophical reasoning (indeed reasoning in general): every piece of reasoning ought to concern either relations of ideas or matters of fact otherwise it is illegitimate. Hume expresses this principle explicitly in a famous passage in section twelve:

> When we run over libraries, persuaded of these principles, what havoc must we make? If we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask, Does it contain any abstract reasoning concerning quantity or number [relations of ideas]? No. Does it contain any experimental reasoning concerning matter of fact and existence? No. Commit it then to the flames: for it can contain nothing but sophistry and illusion. (*EHU*, 12, 34)

This has been seen as the basis for a critique of speculative (rationalist) metaphysics that developed in Kant and which reached its heights in the *logical positivist* movement in the early part of the 20th century.

Hume's epistemology (2): reasoning with matters of fact (EHU section 4; part 2)

Having made the distinction between relations of ideas and matters of fact Hume spends the rest of Section Four considering the nature and ground of our claims to know matters of fact. Why not spend time considering (knowledge of) relations of ideas? This is obviously to do with the degree of certainty with which we can know relations of ideas and the certainty of our methods of coming to know such things. The intuitive and demonstrative certainty of relations of ideas makes it nigh on impossible to suppose that such things could ever be *doubted*. Could we ever *doubt* that 2+2=4? We need to be clear that being in a position to doubt that 2+2=4 is not the same as getting the sum *wrong*. If as a small child (in an arithmetic test) I claimed that 2+2=5 that was obviously not the expression of a doubt on my part (that 2+2=4) but rather an expression of the fact that I had not as yet learnt how to add. Once it was made clear to me how to add properly and I indicated that I understood how to add (by doing my sums correctly) doubt would be excluded (logically). Hume's concern is that this is not the case with knowledge of matters of fact; indeed although he does not say so explicitly it seems that for something to be a matter of fact for Hume is (at least in part) for it to be *doubtable*. This begins to explain the title of section four: '*Sceptical doubts* concerning the operations of the understanding'. Hume's concern here is that it is always possible (at least in principle) to doubt, that is to say be sceptical about claims about matters of fact. This concern leads Hume to consider in some depth the *nature* and *ground* of knowledge of matters of fact.

What is of particular interest at this point in Hume's text is the extent to which Hume seems ready to pursue the sceptical doubts. Hume is well known in the philosophical tradition as a sceptic and it might be thought that this juncture in the text presents the perfect opportunity for Hume to make clear his sceptical credentials. In fact what is most obvious at this point in the text is the degree to which Hume wishes to *mitigate* or *qualify* his scepticism. We might well think that since the possibility of *doubt* (and therefore scepticism) infects *all* claims concerning matters of fact that Hume's concern in this section will be with scepticism in general, that is to say, with the possibility of knowledge of matters of fact as such or in general. But immediately Hume makes clear that this possibility is not what is at stake. Hume immediately identifies two sources of knowledge of matters of fact that he is *not* going to question or even investigate (at least at this stage):

- the present testimony of the senses.
- the records of our memories

This is profoundly significant as regards our judgements concerning the extent of Hume's scepticism. While this exclusion of sense experience and memory from sceptical doubts is not a general feature of Hume's philosophy it does lend support to the thought that Hume's scepticism is not as radical as interpreters have made out. Hume at least at this point then accepts that we can gain knowledge of matters of fact through our current sense experience and from our memories. Understood *temporally* this seems to indicate that for Hume knowledge of the *present* (sense experience) and the *past* (memory) is (again, at this stage at least) to be considered relatively secure. Of course, this leaves untouched the question of knowledge of the *future* (or prediction): how do we come to know about future events? This represents one way of putting a general concern which is not just about knowledge of what is yet to come (future) but is in fact about knowledge of what is beyond any of our current experiences, i.e., knowledge of the unobserved. While our talk of knowledge about, e.g., David Cameron seems well grounded and in many cases justified (through reference to either sense experience or memory) what of more exotic scientific claims in particular? How do we *know* that on the planets orbiting distant stars objects behave as they do here on Earth? Or, indeed, how do we even *know* that here on Earth objects will behave tomorrow as they did today? It is precisely these sorts of question that will lead Hume to consider the so-called "problem of induction". While Hume is relatively sanguine about the prospects for knowledge based on sensory and memorial evidence his conclusions about the prospects for other forms of knowledge of matters of fact are pessimistic to say the least. As Hume will conclude, claims to know matters of fact that are not based on sense experience or memory can have no rational basis whatever.

Reasoning with matters of fact: the argument

Having distinguished relations of ideas and matters of fact Hume goes on to ask:

> '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.' (*EHU,* 4, 3)

In response to this question Hume presents an argument.

Hume's (sceptical) argument

This argument has three premises:

- knowledge of matters of fact that is not based on present perception or on memory is always based on causal relations. (*EHU* 4, 4-5)
- causal relations are not knowable *a priori*, but only by inference from past experience (induction) (*EHU* 4, 6-13)

- Inference from past experience (induction) cannot be rationally justified. (*EHU,* 4, 14-23)

The conclusion of the argument is that no rational principle or argument provides a sure foundation for the (inductive) inferences we make from past or present evidence to future existence.

Argument for premise (1):

Hume's argument for thesis (1) is not really an argument at all. Hume simply presents a number of examples of what he calls 'reasonings concerning matters of fact', showing in turn that the significant aspect of each involves recognising a *causal* relation. Hume then simply asserts that 'if we anatomise all other reasonings of this nature, we shall find that they are founded on the relation of cause and effect . . .' (*EHU*, 4:4). Here are Hume's examples.

Friend in France

If I believe that my friend is in France, what is the basis of this belief bearing in mind that since I am in Edinburgh I obviously cannot see my friend (ignore for the moment annoying technological advances like t.v. that rather spoil Hume's point) and memory seems of little help here (it might be worth thinking why)? Hume's answer to this question is simple: the basis of this belief must be some other fact that *explains* it. In the case laid out Hume suggests that the fact that I received a letter from my friend postmarked in Paris or the fact that my friend promised he would be in France (and he is trustworthy) would serve here to explain my belief. We then need to ask, how do these facts serve to *explain* my belief (that my friend is in France)? Hume insists that the explanation is *causal*: the fact that I received a letter from my friend postmarked in Paris (etc.,) is the *cause* of my belief that he is in France. This, then, is a clear example of reasoning from the observed (the letter) to the unobserved (my friend in France) and is clearly based on reasoning from cause to effect (or effect to cause).

Watch on a desert island

A man finds a watch (or other complex machine) on a desert island and concludes that since it is not his own there must have been other people on this island at some time. Supposing that the man can neither see nor remember other people on the island, what is the basis of this inference? Again, the point is simple: watches do not just appear out of thin air or indeed through some purely natural (physical) process, rather watches are constructed and carried by human beings; therefore, the fact of the watch's being on the island is the reason for or cause of the man's belief that there were other people on the island at some time.

Voice in Dark

When I hear a voice speaking in a darkened room I conclude that there is some other person present with me; why? Since the cause of articulate speech is always a human being, I infer back from the effect (the speech) to the cause (the speaker). Here my belief that there is a person present with me in the dark is caused by my hearing rational discourse. Again, beyond the bounds of perception and memory, I engage in causal reasoning.

While Hume does not present any decisive reasons for his claim that all knowledge of matters of fact is and indeed *has* to be based on the relation of cause and effect, his claim does at least seem plausible. It seems reasonable to suppose that to know something (a matter of fact) one ought to be or have been *in some way* causally related to the fact known. Admittedly, the pathway that traces out the causal relation may be extremely complex - as it will be if the knowledge has been transmitted from person to person and through other media like books - but still it does seem that we must surely be able to trace out some such pathway so as to guarantee that what we are talking about here is in fact something we can legitimately call *knowledge*. (It may be worth considering the following question(s): is the fact that there is a causal pathway (an identifiable causal relation between the fact known and the fact of its being known) ever *sufficient* to ground or justify a claim to knowledge? Or, in fact, is it no more than a *necessary* condition of knowledge?)

Despite its initial plausibility however we may well have grounds for suspicion about the general validity of Hume's claim. One obvious point is that while Hume sets out to show something about *knowledge* of matters of fact his examples seem to concern something rather different, viz., *belief* about matters of fact. Is this important? This point seems to relate to the one made above. Simply being caused to believe something would hardly seem to be the same as coming to know something; there are many things I am caused to believe that could hardly be said to count as cases of knowledge. This seems to relate particularly to a concern about justification. Perhaps what is lacking in a purely causal account is a convincing story about how our claims of knowledge are *justified*? On the assumption that knowledge claims need to be justified, can a purely causal account offer a means of justifying our beliefs?

Argument for premise (2):

Having taken himself to have secured the claim that all knowledge of matters of fact rests on causal reasoning, Hume goes on to ask, 'how we arrive at the knowledge of cause and effect?' [4:5] Hume's answer is that such knowledge has to be *a posteriori* (gathered through experience) and not *a priori* (through the mere operation of thought). More specifically Hume states that if some cause (or effect) is new in our experience, then we cannot tell, either just by looking (sense

experience) or by thinking (pure reason) what its effect will be (or cause was). We need (past) experience of the effect (or cause). Hence we cannot have *a priori* knowledge of causal relations.

Hume distinguishes a positive and a negative argument.

Positive argument

The argument has already been stated: if some cause (or effect) is new in our experience, then we cannot tell, either just by looking (sense experience) or by thinking (pure reason) what its effect will be (or cause was). We need (past) experience of the effect (or cause). Hence we cannot have *a priori* knowledge of causal relations.

Hume's argument for premise (2) opens with the following claim:

> Let an object be presented to a man of ever so strong natural reason and abilities; if that object be entirely new to him, he will not be able, by the most accurate examination of its sensible qualities, to discover any of its causes or effects.' (*EHU*4:6)

Hume backs up this claim with an example: could someone put on Earth for the first time ('Adam') tell just through recognising its sensible qualities (transparency and fluidity) that (in certain circumstances) water would suffocate him? Or, indeed, through a perception of warmth and light that fire would consume him? Hume insists that there would be no way to tell these things, no matter how rational the person was. So as to emphasise this point Hume considers a number of additional examples.

Two smooth pieces of marble

Without any science or experience, could a man tell just by looking that two smooth pieces of marble placed together would require a great force to be separated in a direct line while only a small force to be separated laterally? Hume's response: 'no!'

Gunpowder

Again without science or experience, could anyone tell just by looking that gunpowder (or what would appear as no more than a dark grey powder) will explode when exposed to a naked flame? Hume's response: 'no!'

Loadstone

Could anyone tell just by looking that a loadstone (magnet) will attract certain metals and not others? Hume's response: 'no!'

Intricate machinery

Could a person describe the function of an intricate machine, e.g., a computer, just by seeing its workings (its insides)? Hume's response: 'no!'

Billiard balls

Could anyone tell prior to any experience of such things that when two billiard balls strike one another one ball will pass on its motion to the other? Hume's response: 'no!'

In each of these examples and, according to Hume, in all possible examples, we require some past experience of how the relevant phenomena work or function so as to be in a position to infer what will happen. In other words, once we have experience of how water can drown or how gunpowder explodes, etc., then we can *predict* what will happen in new cases. Prior to such experience Hume claims we can have no way of knowing what will happen. Hume is making an important *psychological* point here; one that will come to feature heavily in the sections that follow. Hume's point is that regular experience of the effects that follow from causes - experiencing their '*constant conjunction*' as Hume puts it - establishes a habit of thought such that when we experience the cause we will expect the effect. Without exposure to the constant conjunction of cause and effect there seems no reason why we would expect any particular effect to follow a particular cause. Hume concludes from his consideration of these examples that we can never tell *prior to (past) experience* - the experience of constant conjunction - what effect will follow from a cause (and what the cause of a certain effect was). As Hume puts it, no such thing 'could ever be discovered by arguments *a priori*'.

Negative argument: a critique of the rationalist conception of causation

Hume recognises that while his positive arguments for premise (2) certainly have some force they may not yet be considered decisive. It might be thought that while Hume presents what is in itself a reasonable account of the relevant matters other accounts could be presented. Until he has considered the cogency of these alternative accounts and shown them wanting Hume accepts that he has not yet made the full case for his own position. This leads Hume to offer a thinly veiled attack on rationalist conceptions of causation. Hume does this because is the rationalist conception of causation can be shown to be incoherent then that will provide an additional reason for us to accept his (empiricist) conception. What is the rationalist conception? This conception supposes that causal relations can be known without recourse to experience. Rationalists suppose this for two basic reasons, each supposedly justifying the claim that if you know the cause you will *automatically* know the effect (without recourse to experience); (contrary to the argument presented above) you will know it *a priori*.

No effect can be said to be contained in its cause.

According to Hume, if we were to be presented with a certain unfamiliar object, substance, etc., and told to predict its behaviour under certain conditions (e.g., when heated or mixed with some other substance) all we could do is 'invent or imagine' (*EHU*, 4:9) some possible effect as following (from those conditions). The question then is, how would or could we restrict the range of invented or imagined effects? Hume insists that without the guide of past experience - constant conjunction - there could be no rationally justified restriction: '. . . this invention must be entirely arbitrary' (*EHU*,4:9). Why so? Hume's point is based on his firm belief that '. . . the effect is totally different from the cause . . .' [4:9] so that '. . . the mind can never possibly find the effect in the supposed cause by the most accurate scrutiny and examination' (*EHU*, 4:9). Hume's challenge then is to find a non-arbitrary, non-question begging way of restricting the possible effects that might follow from a cause. In the text Hume issues this challenge using his favourite example:

> When I see, for instance, a billiard-ball moving in a straight line towards another; even suppose motion in the second ball should by accident be suggested to me, as a result of their contact or impulse; may I not conceive, that a hundred different events might as well follow from that cause? May not both these balls remain at absolute rest? May not the first ball return in a straight line, or leap off from the second in any line or direction? All these suppositions are consistent and conceivable. Why then should we give preference to one, which is no more consistent or conceivable than the rest?

This restriction cannot come by simply stating that the effect is whatever is in the cause because that is precisely what is at issue here: in what sense can the effect be in the cause if they are, as Hume supposes, entirely separate events? If the effect were in the cause wouldn't the effect be obvious? If that were true then how do we explain the difficulties presented by Hume's examples above?

Of course there is an obvious response to Hume's objection: why need we suppose that the cause and effect are entirely separate events? Isn't this supposition just as arbitrary as the rationalist claims about containment? The obvious point to make against Hume is that far from being entirely separate causes and effects are in fact 'inseparable'. In what might this inseparability consist? One obvious answer is that the link between cause and effect may be grounded in a law of nature. Hume turns then to consider this claim (a claim which he obviously rejects).

There is no 'inseparable and inviolable connexion' (EHU, 4:13) between causes and effects

Having considered the claim that effects are contained in their causes Hume goes on to look at how we might justify the general idea that causes and effects are in some sense intrinsically related. Remember that Hume's concern here is not to clarify in a positive sense what a causal relation is (he will turn to that in section seven) but rather to consider whether causal relations could ever be known a priori. So Hume's concern is not so much to deny that there is any link

between cause and effect but only that this link could be established prior to any experience of it. At this point in the text, in a way that again seems to mitigate his supposed scepticism, Hume accepts that certain causes and effects are governed by laws of nature. (Hume's scepticism at this point is limited to the claim that we may never discover the 'causes of these general causes' (*EHU*, 4:12), that is to say that there may be no explanation of why something is a law of nature. It is important to note that this claim is quite different from the one usually attributed to Hume, viz., that there are no laws of nature.) Hume accepts this, citing the laws of elasticity, gravity, cohesion and motion as examples. But Hume goes on to insist that each such law is only discoverable through experience, that is, through experiment and observation. According to Hume the rationalist conception would depend on there being a law that could be determined independently of such experience, a law that could be discovered through the *a priori* sciences, e.g., geometry. In other words, we would have grounds for endorsing the suggestion that there is an 'inseparable and inviolable connexion' between cause and effect if this connexion could be seen to be sufficiently similar to those that exist between the various elements of, e.g., geometry. Hume accepts that geometry and indeed mathematics in general are essential to our attempts to specify and determine the *application* of laws of nature but nevertheless '. . . 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' (*EHU*, 4:13).

Argument for premise (3) - 'the problem of induction':

Hume started Section Four by asking, what is the nature of all knowledge concerning matters of fact? Hume's answer was that all such knowledge rests upon causal relations (premise (1)). Hume then asked, what is the epistemic foundation of causal relations? Hume's answer was that causal relations are known only through experience (*a posteriori*) (premise (2)). Hume's final question in Section Four is, what are the rational credentials for inferences based on experience? Hume's radical answer will be that such inferences have no rational credentials.

The actual argument proceeds as follows (with two premises):

- The validity of causal inferences (and therefore their rational credentials) depends upon our being able to justify a general premise or bridging proposition (e.g., the future will resemble the past).
- Bridging propositions cannot be justified either deductively or inductively and therefore cannot be justified at all. Therefore, causal inference have no rational foundation.

Argument for (a): causal inferences require bridging propositions

Hume's attempt to defend his third premise starts with a general consideration of the (rational) structure of causal inferences. Hume returns to points made in the course of his defence of premise (2): just as there is no necessity in the move from cause to effect, so there is no necessity in the move from the premises to the conclusion of a causal inference. In other words, causal inference are invalid. This claim cannot be defended, of course, without some clear idea about what Hume means by a causal inference, that is to say an inference based on (past) experience. What Hume appears to have in mind is something like the following:

A: all observed As have been followed by Bs (e.g., all previously eaten bread has been nourishing; all (observed) swans have been white)

B: all As are (followed by) Bs (e.g., all bread is nourishing; all swans are white)

From the fact that we sometimes make mistakes when we engage in causal, or what we might also call inductive reasoning it is clear that it is not infallible - this stresses the difference between induction and deduction. The move from A to B here is clearly invalid as it stands - there might be as yet unobserved non-white swans and the next piece of bread I eat may be contaminated; as Hume puts it, '[t]he connexion between these propositions is not intuitive' (*EHU*, 4:16). In other words, it is perfectly possible for A to be true and yet B be false. The question then is, how might we shore up the inference from A to B so as to make it valid? The obvious response and the one Hume pursues is to add an additional claim (or premise) to the argument which in combination with A makes the move to B valid. What might this additional premise (or 'medium') be? (It should be noted that this additional premise is an instance of what we previously called a 'bridging proposition') At various points in the text Hume offers a number of different possibilities:

- Similar causes have similar effects.
- Nature is uniform
- The future will resemble the past.

If any of these suggestions are added as premises to the standard inductive inference then it does become a valid inference (e.g., if all (observed) swans have been white and nature is uniform then it does follow that all swans are white). While this provides a satisfactory solution to the logical problem - the inference is now valid - Hume is concerned with the wider picture. Do we have any reason to believe that any of these bridging propositions are in fact true? How might we show, for example, that nature is indeed uniform? This leads us to Hume's argument for (b).

Argument for (b): no bridging proposition can be justified rationally.

Hume's basic claim is that no rational argument - whether deductive or inductive - can support our belief in the truth of any bridging proposition. Hume's argument for this conclusion is straightforward:

(1) There are only two ways to prove claims: through 'demonstrative' (deductive) or 'probable' (inductive) argument. (*EHU*,4:18)

(The plausibility of this premise in Hume's argument is entirely dependent upon how it is cashed out. There are a number of logical issues here concerning how we should understand what Hume is saying and our coming to accept Hume's claim seems to depend upon the resolution of these issues. However, so as to limit the scope of what is said here we should perhaps allow Hume this premise.)

(2) The claim ('bridging proposition') (e.g.,) that the future will be conformable to the past cannot be proved demonstratively (deductively) because its negation (the claim that the future will not conform to the past) does not imply a *contradiction*.

Hume's defence of (2) seems plausible enough. What would it be for the claim, e.g., that the future will resemble the past ('*p*') to be demonstrable? The claim that *p* is not demonstrable because there is no other claim (or claims) a_1(,a_2, a_3, . . . a_n) such that the conjunction of (¬*p*) and a_1(,a_2, a_3, . . . a_n) is or entails a contradiction (remember to generate a contradiction claims or claims a_1(,a_2, a_3, . . . a_n) must themselves in turn be either *intuitively certain* or *deducible* from propositions that are). Clearly in the cases that Hume suggests no such contradiction is generated - there is nothing *contradictory* about the claim, e.g., that the course of nature may change. (*EHU*, 4:18)

(3) The claim (e.g.,) that the future will be conformable to the past cannot be proved probably (inductively) because all inductive inferences are dependent upon this claim for their validity, so that any inductive proof of the claim would be *circular*.

Could the claim that the future will resemble the past itself be proved inductively? What would such a proof amount to? An inductive proof of this bridging proposition would have to be based on the thought that since in the past the future has always turned out to resemble the past, the future will always resemble the past. But it is clear that for this argument to be convincing - in the sense that Hume wants - it must in some sense depend upon the very premise that we are looking to prove, viz., that the future will resemble the past. Hume insists that this is not acceptable; the

reasoning is plainly 'circular' (*EHU*,4:21). Although this may have the appearance of a genuine proof, for Hume, the fact that we cannot provide an independent argument for the truth of the crucial premise makes the argument as a whole suspect. But we may still have doubts about Hume's own reasoning here; what is so wrong with the inductive proof offered? Getting clear about this is important because it is obvious that from the point of view of inductive logic the argument that Hume presents is (on those terms) valid. If we were to take Hume's point as denying that then it seems clear that we would have grounds for resisting Hume's conclusion. Why? Well, if Hume is simply saying that he doesn't like induction, say, because it lacks the certainty of deduction then that is a prejudice we do not have to share (at least without an argument). What this means is that the invalidity Hume finds in *this* inductive argument cannot be a general invalidity, viz., something that invalidates *all* inductive arguments but must be something peculiar (to this argument). This is indeed Hume's position. Hume does not deny that we can and do engage in inductive arguments - that would be too strong a line to take - but what he can and does deny is that induction can be its own ground, viz., that we can use inductive arguments to justify induction in general. This, then, makes it clear that Hume is concerned not so much with induction in general but with any attempt we might make to put induction to a particular use, viz., to justify induction.

(4) Therefore, the claim that (e.g.,) nature is uniform cannot be *proved* at all.

Without any basis in the only two forms of reasoning available, Hume concludes that bridging propositions cannot be proved at all. This then feeds back into Hume's point about causal inferences in general. Since causal inferences rest upon bridging propositions and bridging propositions can themselves be given no rational foundation (no foundation in any form of reasoning) causal inferences, ultimately, have no rational foundation.

Dissolving the problem?

A response to the problem of induction (which derives from *Peter Strawson*) is to claim that we should not judge induction against the standard of *logical validity*, but against a standard of *reasonableness*. A reasonable induction might be one that is based on a large number of observations made under varied conditions and for which there is no falsifying evidence. If one talks up the points that (i) Hume takes custom to be a psychological principle 'of equal weight and authority' to reason (*EHU*, 5:2), (ii) that he clearly thinks of inductive inference as an essential and useful psychological function (the 'great guide of human life' (*EHU*, 5:6)), and (iii) that he takes the time to describe in detail the method by which we reason probabilistically (*EHU*, 6), then there is at least some evidence that Hume's own view *may* be that induction is *practically justified*. And that position may not be a million miles away from Strawson's

'reasonableness' view. (the problem is: what it is exactly that guarantees that reasonable inductions will lead in the direction of truth. The support had better not be inductive!)

The contemporary debate on induction: Goodman

The problem of induction has developed over the years since Hume. The problem has re-emerged in a new form recently. The so-called 'new riddle of induction' is due to *Nelson Goodman* (*Fact, Fiction and Forecast*, 1954). Consider the following Humean induction:

1. All observed emeralds are green
Therefore
2. All emeralds (observed and unobserved) are green

This inference is very familiar and (if we leave Hume's problem to one side) comfortable. But now say that we invent a new adjective *grue* defined as follows:

X is *grue* = either x is green and observed before midnight on 31st December 2001 or x is blue and not observed before midnight on 31st December 2001

So, anything observed now which is green is also grue. In particular, all emeralds observed now are grue. Thus we have an alternative Humean induction:

1. All observed emeralds are grue
Therefore
2. All emeralds (observed and unobserved) are grue

The problem, then, is this: surely we want to say that the hypothesis 'all emeralds are green' is genuinely confirmed (to some degree) by the evidence, whereas the hypothesis 'all emeralds are grue' simply isn't. What on earth is grue anyway! Unfortunately, however, the two hypotheses appear to be equally well supported by the *currently available* evidence. Things get considerably worse once one realises that by varying the details of the positional phrase (the date of 31st December in the foregoing formulation) we can almost certainly create an infinite number of grue-like adjectives, and thus an infinite number of competing hypotheses, for each case. So, *right now*, what justifies us in saying that some hypotheses (the ones we favour) are genuinely confirmed by the evidence, whereas other hypotheses (the grue-like ones that we don't favour) are not? We want to exclude the 'dodgy' adjectives, but how? The obvious target is the reference to time in the definition of 'grue'. So why can't we just say that all adjectives that feature this sort of temporal condition are bogus, and therefore that any hypotheses in which they feature are not

candidates for confirmation by (apparent) evidence? Goodman's response turns on the invention of another new adjective *bleen,* defined as follows:

X is *bleen* = either x is blue and observed before midnight on 31st December 2001 or x is green and not observed before midnight on 31st December 2001

So, anything observed now which is blue is also bleen. In particular, all sapphires observed now are bleen. Goodman's next move is to present a definition of green in terms of grue and bleen. Thus:

X is green = either x is grue and observed before midnight on 31st December 2000 or x is bleen and not observed before midnight on 31st December 2000

A similar definition could be provided for blue. According to Goodman we can imagine a native grue-bleen speaker. For this individual, green and blue are the 'dodgy' adjectives because they feature temporal conditions. So, says Goodman, if one were to adopt a position that is outside the two languages, there is no reason to prefer our familiar green-blue talk over the alternative grue-bleen talk. There is no such thing as an intrinsically non-positional predicate. It all depends on where you start linguistically.

The grue example raises the following philosophical questions that seem to take us beyond Hume's own problem of induction: Why does a positive instance of a hypothesis give us any grounds for predicting future instances? What is a positive instance of a hypothesis anyway? Which hypotheses are confirmed by their instances?

Beyond induction

The conclusion of Hume's argument (which is in a sense simply another way to express thesis (3)) is that there can be no rational foundation for any claim to know a matter of fact (beyond present perception or memory). Once the 'sceptical' conclusion is reached it is worth asking, 'By presenting his sceptical argument does Hume want us to give up inductive reasoning?' No.

> In reality, all arguments from experience are founded on the similarity, which we discover among natural objects, and by which we are induced to expect effects similar to those, which we have found to follow from such objects. And though none but a fool or a madman will ever pretend to dispute the authority of experience, or to reject that great guide of human life; it may surely be allowed a philosopher to have so much curiosity at least, as to examine the principle of human nature, which gives this mighty authority to nature. (*EHU*, 4, 20)

Hume's point is not that we should give up our claims to knowledge concerning matters of fact but that we should be clear about the foundation of such claims. Hume's basic point, which he develops more fully in Section Five, is simply that this foundation is not *reason* but is in fact a quite separate mental (psychological) operation.