

Why Hume's Problem is *Still* a Problem

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Introduction

Hume's problem is often stated in the form of a simple dilemma: Any argument intended to justify induction must be either deductive or inductive. But there cannot be a deductive argument for induction, because we cannot deductively establish that an inductive argument will ever provide us with a true conclusion, since the conclusions of inductive arguments are contingent. And any inductive argument for induction would beg the question. Therefore, no argument can justify induction. The thesis of this paper is that this caricature of Hume's argument is nothing but a strawman; that Hume's argument is actually much stronger, and remains problematic for any attempt to justify induction. I will proceed by outlining Hume's argument, all the while restating it in more contemporary terms. I will then proceed to show how contemporary attempts at justifying induction fail to overcome Hume's problem, including a scientific version of Hume's own solution.

1. Hume's Problem

1.1 The Objects of Human Reason

Hume's argument against the possibility of justifying induction is no simple dilemma. He begins by dividing "the objects of human reason ... into two kinds, to wit, Relations of Ideas, and Matters of Fact." (§4.1; p. 25) Relations of Ideas consist in "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."

(§4.1; p. 25) As for matters of fact, he says that they “are not ascertained in the same manner; nor is our evidence of their truth, however great, of a like nature with the foregoing. The contrary of every matter of fact is still possible; because it can never imply a contradiction, and is conceived by the mind with the same facility and distinctness, as if ever so conformable to reality.” (§4.1; 25) In the above Hume refers to the “objects of human reason” as “affirmations” and “propositions”, so I suggest it is correct to think of them as *propositional beliefs*; where Relations of Ideas are analytic, necessary, and are known *a priori*, and Matters of Fact are synthetic, contingent, and are known *a posteriori*. For purposes of clarity, I will hereafter refer to Relations of Ideas as *a priori propositions*, and to Matters of Fact as *a posteriori propositions*.

Now one might object that, in making this distinction, Hume is assuming that the terms ‘analytic’, ‘necessary’, and ‘*a priori*’ are all coextensive, and likewise for the terms ‘synthetic’, ‘contingent’, and ‘*a posteriori*’. Kant, for example, thought that some *a priori* propositions are in fact synthetic. On Kant’s view (i.e. Transcendental Idealism), experience can never prove contradictory to a synthetic *a priori* proposition. But if we can see *that* a proposition is synthetic, then we can at least entertain its negation, at which point we may wonder whether we are justified in believing it, and whether or not experience will ever contradict it. Furthermore, this objection only bears weight if one is an idealist, which I assume most of you are not. Kripke, on the other hand, has shown that many *a posteriori* propositions are in fact necessary.¹ But this Kripkean sense of necessity is metaphysical in nature, whereas Hume was concerned with the epistemological question of our justification for having certain propositional beliefs. Prior to the discovery *that* water is H₂O, for example, no one would have been *justified* in believing that water is H₂O. Subsequent to this discovery, however, one certainly could raise Hume’s problem

¹ Or so it is said. Kripke’s argument depends heavily on the causal theory of reference which, while currently enjoying wide support among philosophers, *may* nevertheless be entirely wrong. And if the causal theory of reference goes, so does Kripkean necessity. But that is another topic for another time.

in regard to our *evidence* for the claim that water is H₂O, regardless of whether or not the identity is necessary in the Kripkean sense. Thus, Kripkean considerations need not concern us here either, and we can safely join Hume in his conflation.²

1.2 The Nature of Evidence

At this point Hume says, “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.” (§4.1; p. 26) This is an epistemological question about our evidence for certain contingent propositions, and he seems to take for granted, at least for the sake of argument, that our memory and senses are infallible.³ So the propositions in question are *not* those for which one has first-person direct evidence, either past or present, but rather those contingent propositions that one must infer from them. In regard to these sorts of inferences, Hume says, “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.” (§4.1; p. 26; *emphasis in original*) In other words, there must be a hypothetical causal relationship between what we observe and what we infer on the basis of those observations. For example, suppose that I open my desk drawer to retrieve my stapler, which I remember having put back there last time I used it, only to find it missing. I might infer that someone took my stapler out of the drawer and failed to replace it, which is a contingent proposition that bears a causal relationship to what I now observe (i.e. that my stapler is missing). Hume goes on to say that “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

² One further worry might involve the analytic/synthetic distinction, which Quine argued against, and I won't attempt to dispute him here. But I will point out that if there is no said distinction, it only makes Hume's problem *worse*, for it then applies (to greater and lesser degrees) to *all* propositional beliefs.

³ Later on in the *Enquiry*, in a section titled “Of Miracles” (§10 part II; pp. 116-131), Hume does not take this for granted, and it has a deleterious effect on first-person evidence for highly improbable propositions.

knowledge of cause and effect.” (§4.1; p. 27) What Hume is saying here is that, in order to understand how evidence can support contingent propositions *via* causal relationships, we need to understand how we acquire our knowledge *of* those causal relationships.

Now Hume makes a rather broad assertion: “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; nor can our reason, unassisted by experience, ever draw any inference concerning real existence and matter of fact.” (§4.1; p. 27) This is an important step in Hume’s argument, and it will turn out to be crucial for understanding why Hume’s problem is still a problem for contemporary justifications of induction. The point here is that *observable qualities* do not allow us to deduce *a priori* causes and effects; rather, we learn of these through experience, and experience only. I cannot, for example, know that pouring water on a fire will extinguish it unless I have had an experience of that effect. There is nothing about fire or water one can observe that will allow one to make this inference. For all I know, given only my observations of fire and water, but independent of any experience of combining the two, the water might cause the fire to grow more intense, or change color, or transform into a rainbow, etc. Thus Hume concludes that “causes and effects are discoverable not by reason but by experience” (§4.1; p. 28), since one cannot be determined to follow from the other *a priori*. It is important to remember that this is an *epistemological* claim about inferring a cause from an effect on the basis of observable qualities alone, unaided by experience. From the standpoint of observation, pouring water on a fire, and the fire going out, are two distinct events, and this is what Hume means when he says that “every effect is a distinct event from its cause.” (§4.1; p. 30)

Now it may be the case that causes and their effects really aren’t distinct events; that there is a *metaphysical* causal relation such that effects follow necessarily (or even probabilistically)

from their causes.⁴ But of course Hume claims that we can't have any *knowledge* of these metaphysical relations:

Hence we may discover the reason why no philosopher, who is rational and modest, has ever pretended to assign the ultimate cause of any natural operation, or to show distinctly the action of that power, which produces any single effect in the universe. It is confessed, that the utmost effort of human reason 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, by means of reasonings from analogy, experience, and observation. But as to the causes of these general causes, we should in vain attempt their discovery; nor shall we ever be able to satisfy ourselves, by any particular explication of them. These ultimate springs and principles are totally shut up from human curiosity and enquiry. (§4.1; p. 30)

We can only observe the qualities of things, but never determine, solely on the basis of those observable qualities, what event will follow from another. The underlying (i.e. metaphysical) causal efficacy is simply *unobservable*. If I pour water on a fire, for example, I can observe *that* the fire is extinguished, but I cannot observe *how* the fire is extinguished (i.e. how the water acts on the fire).

Here one might be tempted to object that we *do* know how water extinguishes fire, and we *can* make predictions about events we haven't yet experienced on the basis of our *theoretical knowledge* of liquids and combustion, for example (assuming that our theories are at least approximately true). But this objection is getting ahead of the argument; up to this point Hume has been investigating the *source* of our theoretical "knowledge", and has determined that it can only be had through the process of observation; *first* we must observe – only *then* can we theorize. Not surprisingly, it is at this point in Hume's argument that he addresses this: "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." (§4.1; p. 31) When I *imagine*

⁴ Hume did not believe in probabilistic causation, but rather supposed that probability resulted from "our ignorance of the real cause of any event." (Cf. §6; pp. 56-59) Nevertheless, Hume's argument is valid even if there is genuine probabilistic causation, since this can only make our epistemological situation more complex with respect to the discovery of causal relationships.

pouring water on a fire (i.e. the cause), I am unable to determine *a priori* that the fire would be extinguished (i.e. the effect). Thus Hume says that “When we reason *a priori*, and consider merely any object or cause, *as it appears to the mind*, independent of all observation, it never could suggest to us the notion of any distinct object, such as its effect; much less, show us the inseparable and inviolable connexion between them.” (§4.1; p. 31; *emphasis mine*) And while it may be that my concept of fire includes “will go out if I pour water on it”, this is quite a different case from my concept of a triangle including “has three sides”. Knowledge of the former relation is derived from experience, whereas the latter is not. Ultimately, Hume’s argument entails that we can’t have theoretical *knowledge*, but only theoretical *beliefs* inferred from other beliefs that are wholly without justification. It would be question-begging at this point to base any objection on the supposition that we *do* (or even *can*) have theoretical knowledge, so long as both sides agree that scientific enquiry proceeds through observation.⁵

1.3 Nature’s Secrets

If the foregoing is correct, then Hume is right to say, “It must certainly be allowed, that nature has kept us at a great distance from all her secrets, and has afforded us only the knowledge of a few superficial qualities of objects; while she conceals from us those powers and principles on which the influence of these objects entirely depends.” (§4.2; pp. 32-33) Again, Hume is taking our observations at face value, and has argued that all our knowledge of the world is based upon them. Furthermore, he has pointed out that any sort of metaphysical causal efficacy is unobservable, since there is no *a priori* connection between one observation and another. Nevertheless, one might wonder whether we can establish causal connections among events on the basis of our observations. Given that we cannot establish such connections *a priori*

⁵ Since Hume’s argument is about justification, I am using the term ‘knowledge’ to mean “justified true belief”. And we need not worry about Gettier cases here, since Hume’s conclusion is that there is no justification for theoretical beliefs anyway, whether or not they happen to be true.

based on observable qualities, perhaps we can base them on observed *similarities*. For example, having observed that pouring water on a fire is followed by the fire being extinguished, one might conclude that, as a general rule, pouring water on a fire will cause the fire to be extinguished. Hume expresses this point rather strangely: “But 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.” (§4.2; p. 33) This peculiar phrasing, while having a specific purpose, may lead one to mistake his intention, which is merely to highlight the epistemic character of observation, and not to advance any metaphysical thesis about meaning and reference. For our purposes, it will be sufficient to think of the phrase “like sensible qualities” in terms of *object/event recognition*, and set aside the question of how we can know, for example, that the colorless, tasteless, odorless, fluid-like substance we are observing is *really* water and not something else. We can also assume that “sensible qualities” means *all* observable qualities, since any substance that is empirically indistinguishable from water would be identified *as* water. So for our purposes it won’t matter whether or not there really are (or could be) empirically indistinguishable substances that are nevertheless distinct in some metaphysical sense. And Hume’s problem is only more profound if there are (or could be) substances with varying causal properties that are otherwise indistinguishable under observation.

The strategy currently under consideration is this: that we can make causal predictions about particular events that we have not experienced on the basis of similar events that we have experienced.⁶ For example, I have observed in the past that pouring water on fire was followed

⁶ Here we should construe “similar events” in terms of object/event recognition and, as in the case of fire and water, for example, a fire of similar size and intensity, along with a similar quantity of water, poured on the fire in a similar fashion.

by the fire being extinguished, so I may suppose that in the future, pouring water on fire will have the same effect. Hume considers this proposal, and poses an intriguing question:

It is allowed on all hands that there is no known connexion between the sensible qualities and the secret powers; and consequently, that the mind is not led to form such a conclusion concerning their constant and regular conjunction, by anything which it knows of their nature. As to past Experience, it can be allowed to give direct and certain information of those precise objects only, and that precise period of time, which fell under its cognizance: but why this experience should be extended to future times, and to other objects, which for aught we know, may be only in appearance similar; this is the main question on which I would insist. (§4.2; pp. 33-34)

So while “pouring water on the fire” and “the fire being extinguished” are two distinct events, I have observed that the former has always been followed by the latter. But past experience only provides evidence of those *particular* instances of pouring water on fire, so why should this conjunction extend to future instances of pouring water on fire? According to what principle are we justified in generalizing from several particular instances of a conjunction of two or more events to a general law subsuming all events of this type? Or, as Hume put it,

At least, it must be acknowledged that there is here a consequence drawn by the mind; that there is a certain step taken; a process of thought, and an inference, which wants to be explained. 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.* (§4.2; p. 34; *emphasis in original*)

Here it is important to be on guard against the very habit of mind which Hume is attempting to illustrate. The point Hume is trying to drive home is that this inference is *not* based on an *a priori* principle, although it does seem to be habitual. The familiar phrasing of this principle is that “the future will resemble the past”, and it is sometimes qualified with a *ceteris paribus* clause (e.g. “in certain relevant respects”). But this phrasing is quite vague, and thereby open to undue criticism, so before we continue I must insist on restating it in unambiguous terms.

I said earlier that we should construe the phrase “like sensible qualities” in terms of *object/event recognition*, and set aside the question of how we can know, for example, that the colorless, tasteless, odorless, fluid-like substance we are observing is *really* water and not something else (cf. p. 7). And this puts an *epistemic* spin on the principle in question, for we are not considering objects and events in-themselves, but rather objects and events as we perceive, recognize, and categorize them. What is meant by “like sensible qualities” is that the objects that are “alike” get subsumed under a particular category (e.g. “water” or “fire”). Once we have subsumed a perceived object or event under a particular category, however, there is no longer any ambiguity. So we can eliminate the ambiguity by dropping “like sensible qualities”, and rephrasing these statements in terms of “what I will categorize as ...”. So, for example, instead of asking whether like causes will, in the future, have like effects as they did in the past, we can ask whether causes which are subsumed under the same category will, in the future, have effects that are subsumed under the same category as in the past. Of course, the obvious objection is to simply accept this and point out that as we get better at discriminating and categorizing objects and events, this problem will gradually be eliminated. But there is an ontological side to this principle as well. And here we can replace “like sensible qualities” with “identical substances” and ask whether *water* (or H₂O) will, in the future, exhibit causal properties identical with those it did in the past. So on the epistemological side, there is an identity made between objects/events according to how we categorize them, and on the ontological side there are identical substances with identical causal properties. In either case the ambiguity of “like” is eliminated, yet the problem remains. Thus we have eliminated the ambiguity, but not the problem. For simplicity I will continue to use the familiar phrasing (i.e. “the future will resemble the past”), but will hereafter abbreviate it as “FRP”.

1.4 Hume's *Real* Dilemma

We have now reached the crux of Hume's argument: the infamous dilemma. Thus far, Hume has argued that any particular cause and effect are two distinct events, such that one cannot reason *a priori* from one to the other. Furthermore, having experienced one or more instances of a particular cause being followed by a particular effect does not allow one to reason that they will be so conjoined in the future, without the principle that FRP. So the pressing question is this: from whence do we derive the FRP principle? Now Hume's dilemma is typically stated in terms of deductive/inductive arguments, but that is not quite right – that just *isn't* how Hume put it. Hume begins by saying that, "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." (§4.2; p. 35) Recall that relations of ideas are propositions that are analytic, necessarily true, and are known *a priori*; propositions of this sort include definitions, tautologies, and any proposition that can be deduced from them. Matters of fact, on the other hand, are propositions that are synthetic, contingent, and are known *a posteriori*; the truth or falsity of propositions of this sort can only be discovered by experience. The reason why it is incorrect to state Hume's dilemma in terms of deductive/inductive arguments is that a great many deductive arguments have *a posteriori* propositions as premises, while inductive arguments may have some premises that are *a priori* propositions. But Hume frames his dilemma using an *a priori/a posteriori* distinction, which obviously (according to what I have just said) does *not* coincide with a deductive/inductive distinction.

Having previously concluded that the FRP principle is not a definition or tautology, Hume's dilemma is whether an argument could be given for it, given that such an argument must be

either *a priori* (i.e. “demonstrative”) or *a posteriori* (i.e. “moral”). Taking the first horn of this dilemma, Hume says,

That there are no demonstrative arguments in the case seems evident; since it implies no contradiction that the course of nature may change, and that an object, seemingly like those which we have experienced, may be attended with different or contrary effects. May I not clearly and distinctly conceive that a body, falling from the clouds, and which, in all other respects, resembles snow, has yet the taste of salt or feeling of fire? Is there any more intelligible proposition than to affirm, that all the trees will flourish in December and January, and decay in May and June? 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*. (§4.2; p. 35; *emphasis in original*)

If I can conceive of a future event that contradicts the FRP principle, then for all I know the FRP principle *may* be false, and this is enough to establish that it cannot be known *a priori*. For example, there is nothing contradictory in the proposition that, at some future time, I will pour water on a fire and the fire will *not* be extinguished, but will grow more intense, or transform into a rainbow, etc. Thus there can be no *a priori* demonstration of the FRP principle.

Taking the other horn of the dilemma, Hume says,

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, according to the division above mentioned. But that there is no argument of this kind, must appear, if our explication of that species of reasoning be admitted as solid and satisfactory. 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. To endeavour, therefore, the proof of this last supposition 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. (§4.2; p. 35-36)

That a particular cause will be conjoined with a particular effect can only be known *a posteriori* through experience. And any argument proceeding from past observations to future predictions must have the FRP principle as a premise. Regardless of how many times similar causes have been followed by similar effects in the past, that does not mean that they will continue to be so

conjoined in the future, unless the FRP principle is true. So any argument, on the basis of so many past conjunctions, that the FRP principle must be (or is probably) true, would be viciously circular. Thus, any *a posteriori* argument for the FRP principle would beg the question.

Hume has argued at length that the FRP principle is not a definition or tautology, nor is it deducible from other principles that are known *a priori*. Thus the FRP principle is not known *a priori*. Furthermore, any argument, be it deductive or inductive, *from* the proposition, that a particular cause has been conjoined with a particular effect in past experience, *to* the proposition, that a particular cause will be conjoined with a particular effect in future experience, *requires* the FRP principle. So any such argument *for* the FRP principle would beg the question. Thus the FRP principle is not known *a posteriori* either. In fact, this principle is not *known* at all; rather, it is a mere belief that is wholly unsupported by any argument or evidence whatsoever.

We are now in a position to restate this dilemma in terms of deduction/induction: Any argument for the FRP principle must be deductive or inductive. But a valid deductive argument must ultimately include this principle as a premise (either explicitly or implicitly), since it cannot be derived from other propositions without circularity, as Hume has shown. And inductive arguments cannot establish anything without the use of this principle, since all arguments from past to future experience rely wholly on it, so an inductive argument for the FRP principle would be circular, as Hume has shown. Thus, *both* types of argument beg the question.

2. Justifying Induction

2.1 The Humean Justification

There have been several attempts to justify induction, and I will begin by considering Hume's own, given in a section of the *Enquiry* titled "Sceptical Solution of These Doubts." (§5; pp. 40-55) Having shown that all arguments from experience rely on the FRP principle, which is

wholly without justification, Hume nevertheless says that “there is no danger that these reasonings [i.e. “moral” or *a posteriori* reasonings], on which almost all knowledge depends, will ever be affected by such a discovery. If the mind be not engaged by argument to make this step [i.e. that FRP], it must be induced by some other principle of equal weight and authority; and that principle will preserve its influence as long as human nature remains the same.” (§5.1; pp. 41-42) But we can straightaway see that, unless this other principle can be known *a priori*, Hume’s solution is going to conflict with his previous argument, for it obviously makes a claim about the future (i.e. “that principle will preserve its influence as long as human nature remains the same.”) However, if this other principle *is* known *a priori*, then it seems that there should be a demonstrative (i.e. *a priori*) argument for the FRP principle, which again conflicts with Hume’s argument. In either case, it seems Hume’s solution is already in trouble.

Hume continues:

This principle is Custom or Habit. For wherever the repetition of any particular act or operation produces a propensity to renew the same act or operation, without being impelled by any reasoning or process of the understanding, we always say, that this propensity is the effect of Custom. By employing that word, we pretend not to have given the ultimate reason of such a propensity. We only point out a principle of human nature, which is universally acknowledged, and which is well known by its effects. Perhaps we can push our enquiries no farther, or pretend to give the cause of this cause; but must rest contented with it as the ultimate principle, which we can assign, of all our conclusion from experience. (§5.1; p. 43)

But why should we accept *this* principle as being exempt from Hume’s argument, and not the FRP principle itself? Isn’t it “universally acknowledged” that FRP? Hume goes on to denote “Custom” as “the great guide of human life” (§5.1; p. 44), but at no point does he provide an argument for this principle, and it certainly isn’t known *a priori*. Thus “Custom” is no better off in this respect than the FRP principle, and yet Hume uses it as a springboard for a rather broad claim:

Here, then, is a kind of pre-established harmony between the course of nature and the succession of our ideas; and though the powers and forces, by which the former is governed, be wholly unknown to us; yet our thoughts and conceptions have still, we find, gone on in the same train with the other works of nature. Custom is that principle, by which this correspondence has been effected. (§5.2; pp. 54-55)

Now Hume has argued that it is one thing to say that a particular cause has always been conjoined with a particular effect in past experience, and quite another to say that it will continue to be so in the future. So what exactly is the argument that the succession of our ideas is in a “pre-established harmony” with “the course of nature”? That this has apparently been the case in past experience doesn’t mean that it will continue to be so in the future, unless Hume is assuming that FRP. And while a scientific basis for “Custom” can be given by evolutionary psychology, it is of no help. Basically, the idea is that our cognitive processes evolved *via* natural selection, and this “Custom”, as a principle of cognitive function, has been naturally selected for, because it allowed our ancestors to survive – *up ‘till now*. But how do we know that this principle will continue to serve us in the future as well as it has in the past? Any argument that it will, quite obviously begs the question; and the theory of evolution certainly isn’t known *a priori*. Thus Hume’s solution is a dead-end.

2.2 The Contemporary Justification

The contemporary justification of induction claims that induction is a self-corrective process of empirical reasoning; that there are inductive inferences, and then there are *meta*-inductive inferences, whereby we can correct for past errors and improve upon our empirical methods. And meta-inductive inferences are not, strictly speaking, circular. In the words of John Vickers, “The application of induction to inductive inference is neither circular nor justificatory. It is *hierarchical and corrective*.” (§7.2; n.p.; *emphasis mine*) But note his conspicuous avoidance of the claim that meta-induction is justificatory. He goes on to say that, “These considerations

suggest deemphasizing the question of justification – show that inductive arguments lead from truths to truths – in favor of exploring methods to assess the reliability of specific inferences.” (§7.3; n.p.) What he seems to be saying is that this process does not provide a justification for *specific* inductive inferences. Nevertheless, this does seem to be a justification of the inductive method in general. Certainty is not a requirement for justification, nor do we need to be fully justified in each specific inference we make; all we need is to be justified in believing that induction, as a method for acquiring true empirical beliefs, is in some sense *better* than random guessing.

So the claim is that induction is “hierarchical and corrective”. Now I will readily grant the obvious: that induction is hierarchical. But being hierarchical is not necessarily a good thing – it can make good things better, but it can also make bad things worse. A hierarchical system of faulty reasoning could, perhaps, be no better at getting the truth than random guessing. So the real question is whether or not meta-induction is a *corrective* process. But the possibility of “correcting” for past mistakes requires that what was a faulty inference in the past will be a faulty inference in the future, and that what would have been a correct inference in the past will be a correct inference in the future. In other words, it requires that FRP. The best we can say here is that induction is hierarchical and *adaptive*, but it always adapts to past experience, and there is no reason to believe that this will provide any better method for the future, other than the FRP principle. And as Hume argued, the FRP principle is wholly without justification. Thus there is no justification for the claim that induction is corrective.

But perhaps this is too quick, for contemporary inductive methods are backed-up by deductive proofs (e.g. *the Laws of Large Numbers*). Now this sort of induction is slightly different than what Hume envisioned. Hume said that, “nature has kept us at a great distance

from all her secrets, and has afforded us only the knowledge of a few superficial qualities of objects; while she conceals from us those powers and principles on which the influence of these objects entirely depends.” (§4.2; pp. 32-33) But modern inductive methods utilize *hypotheses* which, as a means for making predictions about future observations, are supposed to correspond to, mirror, or otherwise parallel nature’s “powers and principles”.⁷ And once a hypothesis has been formulated, the question is no longer whether FRP, but whether the hypothesis is true.

To evaluate hypotheses we need a way to determine the extent to which the hypotheses are supported by *evidence*, and the best current method for doing this is *Bayesian Confirmation Theory* (BCT). I won’t bother with the gritty details here; what is important is that, in light of experimental evidence, the likelihood of a hypothesis being true can be determined using Bayes’ theorem, which in turn follows from the axioms and definitions of the probability calculus. Furthermore, there is a theorem, called the *Likelihood Ratio Convergence Theorem* (LRCT), which shows that evidence is *very likely* to support true hypotheses over false hypotheses.

According to James Hawthorne, given two hypotheses h_i and h_j ,

The *Likelihood Ratio Convergence Theorem* shows that when h_i is true and h_j is empirically distinct from h_i , it’s *very likely* that a sequence of outcomes e^n will occur that yields a sequence of likelihood ratios $P[e^n | h_j \cdot b \cdot c^n] / P[e^n | h_i \cdot b \cdot c^n]$ that approach 0 as the evidence accumulates (i.e., as n increases). (§5; n.p.; *emphasis in original*)

In other words, it is *very likely* that we will get evidence that favors true hypotheses over false ones. Now all of this is supported by deductive proof, and I won’t dispute any of it. Nevertheless, there is one difficulty: the LRCT, by itself, doesn’t tell us *what* to believe.

In regard to this point Hawthorne says, “Given this truth-indicating feature, it makes good epistemic sense to have degree-of-confirmation influence belief-strength... A view that cannot

⁷ It makes no difference to this point whether one is a scientific realist or an instrumentalist. All that is required is that a hypothesis makes a connection between, say, experimental conditions and observable outcomes. What goes on “behind the scenes” is of no consequence; what is important here is whether or not the predictions are accurate.

reasonably tie confirmation to appropriate belief presents us with a useless contrivance.” (§4; n.p.) He goes on to say, “As I see it, a confirmation function is supposed to be a kind of truth-indicating index. And it can be expected to perform successfully in this role *when things are working right*.” (§4.3; n.p.; *emphasis mine*) Elaborating on this *ceteris paribus* clause he says,

If, among the alternative hypotheses proposed to account for a given subject-matter, we are fortunate enough to think up a hypothesis that happens to in fact be true, and if we find ways to empirically test it against rivals, then all that’s needed for success is persistence and not too much bad luck with how the evidence actually turns out. (§4.3; n.p.)

Now one might object that this process involves a lot of assumptions about luck, but I am prepared to grant all the luck in the world, and simply pass over this point. And Hawthorne is very careful to point out that the LRCT provides no iron-clad guarantees. For example, he says that, “[The LRCT] doesn’t imply that we’ll ever be in a position to justly be certain that our best current candidate is the true alternative.” (§4.3; n.p.) And this is perfectly acceptable, since justification *doesn’t* require certainty. Thus Hawthorne suggests what he calls the *Belief-Confirmation Alignment Condition*, which states that “Each agent should bring her belief-strengths for hypotheses into alignment with their degrees-of-confirmation on all of the relevant evidence she is aware of.” (§4.3; n.p.) There is one catch, however: BCT cannot promote true hypotheses to “best current candidate” status unless we first *formulate* them, and so we might wonder if we are justified in believing that we ever will. If it turns out that we have no justification for believing that we will ever formulate true hypotheses, then we have no justification for believing that BCT will ever provide us with the truth – this is the *Achilles’ heel* of BCT.

2.3 The Scientific Method

If it can be shown that we are justified in believing that we have a reasonable chance of formulating a true hypothesis, then BCT takes over and all is well for induction. I will begin by

assuming that we are at least cognitively capable of formulating a true hypothesis, so the question then becomes: how likely is it that we will ever do so? It is quite unlikely that we will ever do so as a result of guessing. And while a brute enumeration of all possible hypotheses *might* be possible, the probability of confirming a true hypothesis would be just as small, given certain reasonable constraints on the number of experiments we could perform. What we need, then, are some guidelines for formulating hypotheses. Simplicity is one, although this only serves as a starting-point, and we are free to formulate complex hypotheses where necessary. Another is that we should formulate hypotheses on the basis of our observations. In fact, observation is the first step in the *scientific method* (i.e. observation, hypothesis formulation, prediction, and experimentation). But here is the problem: by formulating hypotheses on the basis of observations, the scientific method *presupposes* that FRP.

As I will demonstrate, a necessary condition for the formulation of a true hypothesis *via* the scientific method is that FRP; or contrapositively, if it is *not* the case that FRP, then a true hypothesis *cannot* be formulated *via* the scientific method. Furthermore, since no non-question begging argument can establish that FRP, no argument can establish that the scientific method is capable of producing a true hypothesis, which in turn means that no argument can establish that there is *any* possibility, however remote, that BCT will ever promote a true hypothesis to the status of “best current candidate” – *not a single one*. And this means that no *argument* can establish that BCT is any more likely to provide us with the truth than guessing.

Any hypothesis we formulate must, according to the scientific method, agree with past observations. And a true hypothesis must, by all accounts, agree with future observations. In this way a hypothesis serves as a connection between past and future observations. But here’s the rub: our hypotheses always assume that, under the *same* experimental conditions, one should

make the *same* observations. In fact, a major tenet of the scientific method is that experiments should be *repeatable*, regardless of time and place, just so long as the experimental conditions are the same. But let us entertain, for the sake of argument, that while certain observations have been made under certain conditions in the past, in the future we will make *different* observations under the *same* conditions. It should be obvious that any hypothesis formulated according to the scientific method would fail to predict those observations. In such a case the predicted observations would fail to obtain, which means that the hypothesis would be false. Indeed, if it is not the case that FRP, then *all* hypotheses ever formulated according to the scientific method are false – *every last one*. Thus the possibility of formulating a true hypothesis *via* the scientific method requires that FRP, so the FRP principle is already built-in to the scientific method. And as Hume argued, the FRP principle cannot be justified.

Epilogue

I have satisfied myself here with a purely negative project, but one that has as extraordinary air of peculiarity. In fact, this whole paper feels a bit silly, like a joke; but there is a serious purpose behind it, which is not to undermine the tenability of induction, but to highlight a curious fact: that induction *cannot* be justified. The interesting thing, however, is not *that* induction cannot be justified, but *why* it cannot be justified. Induction does not stand alone as something *odd* that needs justifying. Of course, it is good to be able to justify one's beliefs and actions, but philosophers have got it in their heads that *everything* needs to be justified. And this leads to philosophical “problems”, like the so-called “problem of induction”. The *real* problem, I think, is one of understanding our cognitive functioning; inductive reasoning is an integral aspect of our cognition – our way of understanding the world.

Of course, one might be tempted to give a pragmatic justification of induction: that it's the only thing we've got, and so we're justified in using it because we do so out of necessity – but even this fails. “Because I have to” is a justification of last resort in all cases (not just epistemological but ethical as well), and isn't so much of a justification as a plea for mercy and forgiveness. But induction isn't something we merely tolerate, for we hold it in very high regard (thus the perennial urge to justify it). To give such a pragmatic justification is to debase induction and the role it plays in our lives. We don't need a justification for induction anymore than we need a justification for being human.

References

- Hawthorne, James. forthcoming. "Confirmation Theory", draft submitted to Prasanta S. Bandyopadhyay and Malcolm Forster (eds.), *Philosophy of Statistics, Handbook of the Philosophy of Science*, Volume 7, Elsevier.
- Hume, David. 1975. *Enquiries Concerning Human Understanding and Concerning the Principles of Morals*. L.A. Selby-Bigge and P. H. Nidditch (Eds.). NY: Oxford University Press.
- Vickers, John. 2006. "The Problem of Induction". *The Stanford Encyclopedia of Philosophy (Winter 2006 Edition)*. Edward N. Zalta (ed.). URL = <http://plato.stanford.edu/archives/win2006/entries/induction-problem/>.