

### The Problem of Induction<sup>1</sup>

Although James and Clifford disagree about the reasonableness of belief in a special class of propositions (when they constitute a genuine choice for us), they agree that in the majority of cases empirical investigation and the scientific pursuit of evidence is at least *a*, if not *the* proper way to proceed in forming beliefs. It appears that at least on most matters and especially in cases where we might be prone to systematic distortion, we'd do well to conscientiously gather empirical evidence before deciding what to believe. They both maintain, in fact, that scientific inquiry is to be contrasted with belief based in faith. Is this contrast warranted?

The problem of induction challenges the alleged contrast. The problem has two parts.

- i) The *descriptive problem*: How do we (in fact) form opinions about unobserved matters of fact?
- ii) The *normative problem*: Is our way of forming opinions about unobserved matters of fact legitimate, justified? I.e., is our "reasoning" about unobserved matters of fact valid?

#### I. The Descriptive Problem

Let's begin with (i). We're focusing on opinions about things we haven't observed, i.e., things we aren't now perceiving and haven't perceived in the past. How do we form such opinions? In some cases the matter is trivial: I believe that all squares have four sides, that in every case of adding two apples and two oranges I will have four fruits, that all tables are furniture. And in each case I know these things without examining all squares, apples, tables. If I imagine that the proposition in question is false, e.g., that  $2+2=4$  is false, then I land myself in contradiction or incoherence. According to Hume, in these cases our knowledge concerns "relations of ideas".

S expresses a *relation of ideas* if and only if its denial is strictly impossible (inconceivable, or self-contradictory).

Relations of ideas are to be distinguished from matters of fact:

S expresses a *matter of fact* if and only if both it and its denial are possible (conceivable, non-self-contradictory).

The claim that I have two children is true, but one could easily conceive its being false. This shows it is a matter of fact, not a relation of ideas. The descriptive problem is how we form opinions concerning *unobserved matters of fact*. Observed matters of fact we are assuming are known on the basis of perception and memory. But perception and memory don't help with *unobserved* matters of fact. Note, in particular, this concerns all of our opinions concerning the future. We don't perceive the future; neither do we remember it. What, then, is the source of

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<sup>1</sup> The historical source of the problem of induction is David Hume (see the excerpt from Hume's *An Inquiry Concerning Human Understanding* in our textbook *Reason and Responsibility*, esp. pp.199). The issues is taken up in a more contemporary matter in Salmon's "An Encounter with David Hume", (*R&R*, pp. 224). For a useful site on Hume and the problem of induction, see: <http://www.princeton.edu/~grosen/puc/phi203/induction.html>. (Note that some material was drawn from that site for these lecture notes with Prof. Rosen's permission.)

our opinions about it? Such opinions are crucial: imagine not having any opinions about the future. Could you undertake any course of action? Hume argues that:

*Opinions about unobserved matters of fact are derived from experience somehow.*

This seems to follow from a consideration of examples: how do we know how something never before examined will behave or what unobserved properties it might have? If the hypothesis we're considering is a matter of fact, any conjunction of properties is possible. So we must consult experience. For example,

In my experience so far, chalk has always easily broken.  
So, in general, chalk is easily broken.

Or, using one of Hume's examples:

In my experience so far, bread has always nourished.  
So, in general, bread nourishes.

This appears to be a general pattern in our reasoning:

(Data) In my/our experience, all Fs are G.  
(Theory) In general, all Fs are G (or at least the next F I examine will be G).

This sort of reasoning is called *induction*, or *inductive inference*. Hume's answer, then, to the descriptive problem is:

*Opinions about unobserved matters of fact are derived from experience by induction.*

## II. The Normative Problem

Let us now turn to the second problem (ii) the normative problem. Is this form of reasoning justified? Notice that the inference from (Data) to (Theory) is not deductively valid: it is possible for the premise to be true and the conclusion false. So should we conclude from this alone that these inferences aren't valid? Is it possible to supply a suppressed premise? Consider:

(UN) If in all my/our experience thus far all Fs are G, then the regularity that all Fs are G occurs generally (now and into the future).

This is the principle usually called the "Uniformity of Nature" principle. But note that it makes the very strong claim that the patterns *that have appeared thus far in my experience* hold generally in nature. Since (Data)+(UN) entail (Theory), whether induction is justified now seems to rest on whether (UN) is defensible. But Hume argues that there is no non-circular defense of (UN):

- i) (UN) expresses a matter of fact. (It's denial is conceivable.)
- ii) (UN) concerns unobserved matters of fact. (It is, in part, about the future.)
- iii) All knowledge of unobserved matters of fact would have to be derived from experience by induction. (Since induction is our only source of such beliefs/opinions.)
- iv) But (UN) is a premise in any inductive argument; and an argument for (UN) that uses (UN) as a premise would be circular.
- v) So there is no non-circular argument for (UN).

Let's try such an argument just to be sure:

- D) In my/our experience, regularities that have held in my experience have been found to occur generally (or at least in the next case).
- T) So in general, if a regularity holds in my experience, it will hold generally.

The inference from (D)-(T) is not valid without (UN) as an additional premise, which will make the reasoning circular. An inductive defense of induction won't work. This suggests that scientific inquiry, i.e., inquiry that attempts to draw conclusions about what is unobserved from what is observed, rests on an assumption that cannot itself be proven, but must be taken as an article of "faith". After all, any evidence we might marshal to support (UN) will be derived from past and present experience, and we cannot use such evidence to support a claim that goes beyond past and present experience without relying on the principle itself.

### III. Questions:

- Does this show that we have no more reason to trust scientific inquiry than any other form of inquiry (crystal gazing, guessing, etc.) in our efforts to gain knowledge of nature?
- Is there any difference in kind between our confidence in science and religious faith?

### IV. Some responses to Hume's argument: (Do you find them convincing?)

- Science is tremendously successful in providing accurate predictions; more successful than any alternative method. This shows (UN) to be acceptable.
- (UN) is a principle of reason; following it constitutes what it is to reason correctly about matters of fact.
- Science relies on better evidence than any alternative methods. This distinguishes (UN) from other principles – the regularities found are more uniform, more systematically tested, etc.

### Hume's reply:

- i) There are no compelling *reasons* to accept (UN), and yet (UN) is not irrational or incoherent.
- ii) The acceptance of (UN) is a matter of habit, maybe even a matter of instinct. In other words, it comes naturally to us.
- iii) If the acceptance of a principle comes naturally to us, and if the principle is not self-contradictory or incoherent, then our acceptance of the principle is rationally justified.
- iv) Therefore, our acceptance of (UN) is rationally justified.

### Compare Hume and James:

Both Hume and James maintain that we are sometimes justified in believing something that cannot be proven. Hume would argue, however, such beliefs are justified only if it is somehow *unavoidable*, perhaps because believing it has been "hard wired" into us, or we just cannot help but believe. James' view is more permissive: within the domain of what cannot be proven, we can believe whatever we want. So, although both Hume and James are more permissive than, say, Clifford, about what beliefs we may be rationally justified in holding, Hume's criterion is more restrictive than James'. For example, Hume suggests that theism is not rationally justified because there is no proof of God's existence, and theism is avoidable (one can live life without belief in God). (See Hume's "Dialogues Concerning Natural Religion" (in RR) for more on this.)