THE PROBLEM OF INDUCTION

We all rely heavily on inductive reasoning. We suppose that because the sun has risen every day in the past, we have good grounds for supposing it will rise tomorrow. But if the philosopher David Hume (*see pp.290–1*) is correct, the past provides no clue at all as to what will happen next.

Great expectations

The most reliable form of argument is deduction. In a valid deductive argument (*see p.195*), the premises logically entail the

conclusion. To take a simple example:

Socrates is a man. All men are mortal. Therefore Socrates is mortal.

If you were to claim the premises are true and the conclusion false, you would be involved in a logical contradiction. In an inductive

argument (see pp.196–7), by contrast, the premises are not supposed to provide a logical guarantee that the conclusion is

Past experience seems to make us certain that some events will happen. Who could possibly doubt that the sun will rise tomorrow?



The fact that every swan we have observed up to now has been white is no guarantee that all swans are white.

true. Rather, the premises are supposed only to provide *evidence* that the conclusion is true. Here is an example:

> Swan 1 is white. Swan 2 is white. Swan 3 is white... Swan 1,000 is white. Therefore: all swans are white.

If we observe one thousand swans, and they are all white, we conclude that all swans are white. We suppose that the premises of our

argument make it reasonable to draw that conclusion. But of course there is no logical contradiction in supposing that even though the first thousand swans we have observed have been white, the next one will not.



We rely on inductive reasoning all the time. Whenever we make a prediction about what will happen in the future or about what is happening, or has happened, in those parts of the universe we have not observed, we rely on inductive reasoning to justify our claims.

For example, I suppose that the chair on which I am about to sit will support my weight. What is my justification for believing that? Well, the chair has always supported my weight in the past. So I conclude that it will do so on this occasion too. Of course, the fact that the chair has supported my weight in the past does not provide me with any logical guarantee that it will do so now. It is possible that the chair will collapse. Still, we suppose that the fact that the chair has always supported me before gives grounds for supposing it will continue to do so. Scientists also rely heavily on inductive reasoning. They construct theories that are supposed to hold for all places and times, including the future. They justify theories by pointing to what they have observed. But claims about what has been observed up to now do not logically entail claims about the future. So, if scientists are to justify these theories, they cannot do so using deductive argument. They must rely on inductive reasoning instead.

IS NATURE UNIFORM?

The philosopher David Hume questions whether we are ever justified in drawing such conclusions about the unobserved. Hume claims that whenever we reason inductively, we make an assumption. We assume that nature is uniform. We assume that the same general patterns exist throughout nature. For what if we

"TIS NOT, THEREFORE, REASON WHICH IS THE GUIDE OF LIFE, BUT Custom that alone determines The Mind, in all instances, to Suppose the future Conformable to the past."

David Hume, A Treatise of Human Nature

didn't assume that? Then we would not draw the conclusions we do. I would not conclude that because the chair on which I am about to sit has always supported me before, it will support me now. It is only because I believe that the same general regularities extend throughout nature, including the future, that I suppose that the chair will support me next time. But it is here that Hume detects a problem. Whenever we reason inductively, we assume that nature is uniform. But if we are to justify our belief that induction is a reliable method of arriving at true beliefs, we need to justify this assumption.

JUSTIFYING OUR BELIEFS

Hume points out that there are two possibilities. We might try to justify the claim that nature is uniform using

How can we know that the laws of physics that we observe locally extend to the whole universe? It may in fact be a patchwork. experience. Or, we might try to justify it independently of experience, perhaps by showing that the claim is some sort of logical truth. The trouble with this second suggestion is obvious enough. The claim that nature is uniform is clearly not a logical truth. There is no logical contradiction involved in supposing that, although nature has been uniform around here up to now, it won't suddenly become a chaotic, jumbled-up mess with things behaving in a random, unpredictable way.

Which leaves but one possibility for justifying the assumption that nature is uniform. We will have to justify it by appeal to experience. One way in which we could do this would be if we could directly observe all of nature. Then we could just observe that it is uniform throughout. But of course we can't do this. We can directly observe only a tiny portion of the universe. Certainly, we can't directly observe the future.

In which case, our justification will have to be by means of an inference based on what can be directly observed. So why can't we observe that nature is uniform around here at the present time, and then conclude that nature is likely to be uniform throughout?

The problem, of course, is that this bit of reasoning is itself inductive reasoning. We would be relying on inductive reasoning in our attempt to show that inductive reasoning is reliable. But this, surely, is an

unacceptably circular way

of justifying something. It would be like trusting in the claims of a psychic by pointing out that he himself claims to be reliable. That is no justification at all.

Hume concludes that though we do reason inductively, we really have no justification at all for supposing that inductive reasoning is likely to lead us to true conclusions. We possess no grounds at all for supposing that things will continue to behave in the same way as they have in the past. Yes, I believe this chair will support me when I next sit on it, that this pen will fall when I release it, and that the sun will rise tomorrow just as it always has. But the astonishing truth is that I have just as much reason to suppose that the chair will collapse, that the pen will slowly rise into the air, and that tomorrow morning a million-mile-

morning a million-milewide luminous inflatable panda will emerge over the horizon.

Of course, Hume's conclusion sounds insane. We would ordinarily consider someone who believes that a million-milewide panda will replace the sun to be mad. But if Hume is correct, this

"insane" belief is no less reasonable than our own belief that the sun will rise instead. The predictions of a madman are no more or less reasonable than those of our greatest scientists.

"BUT IT WORKS"

It can be tempting to respond to Hume's problem of induction by pointing out that inductive reasoning has been highly successful. By relying on inductive reasoning, scientists have achieved extraordinary things, from electric light

"THE SUPPOSITION That the future Resembles the Past is not Founded on Arguments of Any Kind, but is Derived entirely From Habit."

David Hume, A Treatise of Human Nature

On Hume's view, using induction to justify induction won't do. That would be like trusting a fortune-teller because she herself claims to be trustworthy.



bulbs and computers to space travel and genetic modification. These towering achievements in science and engineering all depended upon inductive reasoning. Doesn't this provide us with excellent grounds for supposing that inductive reasoning is a reliable method of arriving at true beliefs?

The trouble with this justification

of induction is, again, that it is itself a piece of inductive reasoning. It points out that induction has been extremely successful up to now, and concludes that it is likely to continue to be successful in the future. But we run into the circularity problem again: using induction to justify induction is like trusting in the claims of an advertisement because the advertisement itself says it is trustworthy.

APPEALING TO RATIONALITY

While we believe we are justified in drawing conclusions about the future. and while we believe the predictions of our greatest scientists are more likely to be true than those of a madman. Hume, astonishingly, appears to have shown these beliefs are entirely irrational. Philosophers continue to grapple with this thorny problem. Some have

By relying on inductive reasoning scientists have achieved stupendous results. Man has walked on the moon Doesn't this show induction is reliable?

suggested that the meaning of the word "rational" is: to reason deductively or inductively. So we don't need to justify the claim that "induction is rational," any more than we have to justify our belief that all bachelors are unmarried

> or that all mothers are female. These claims are, if you like, analytic (see pp.66-7), or "true by definition."

One difficulty with this move is that even if we accept that the claim that "induction is rational" is "true by definition," the problem is only postponed. Hume asks us how we can know that induction will reliably lead us to true beliefs about the future Insisting that induction is rational is "true by

definition" merely raises the question: what grounds do we have for supposing that "being rational" will reliably lead us to true beliefs about the future? Why suppose "rationality" will be any more a reliable guide to the future than relying on the guesses of madmen?

The problem of induction has led some thinkers to seek alternative ways of establishing scientific truths (see overleaf).

IUST HOW RADICAL IS HUME'S THEORY?

It is easy for those who are new to philosophy to underestimate just how radical Hume's position on induction really is. His conclusion is not, as it might at first glance appear, that we cannot be completely certain what will happen in the future. We can all agree that there is at least some room for error when it comes to predicting the future. Rather, Hume's conclusion is that we have no grounds at all for supposing things will continue on in the same way as they have up to now. If Hume is correct, science is a wholly irrational activity. and the predictions made by scientists are no more rational than those of the insane.

"Mad scientists" only appear in fiction. But according to Hume, the inductive reasoning used by all scientists is more or less mad, insofar as it has no rational basis.





If Hume is correct, it is as rational to

expect the next horse's body to sport

the torso of a man as it is otherwise.