

WHY EXPECT THE SUN TO RISE TOMORROW?

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In this extract from his book *The Philosophy Gym*, Stephen Law (1960–) outlines and explores what has come to be known as The Problem of Induction. All of us expect the sun to rise tomorrow. But what is this expectation based on? Can we really be justified in assuming that the future will be like the past? Law investigates these questions through lighthearted dialogue, but the issues he addresses are deep and far-reaching, as you will see.

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Every morning we expect the sun to appear over the horizon. But according to the philosopher David Hume (1711–76), our expectation is wholly irrational. This chapter gets to grips with Hume’s extraordinary argument.

AN ABSURD CLAIM?

The scene: MacCruiskeen, a scientist, is watching the sunrise. She’s accompanied by her close friend Pluck, a student of philosophy.

Pluck: Beautiful sunrise.

MacCruiskeen: Yes. And right on time, too.

Pluck: Yet there was no good reason to expect it to rise this morning.

MacCruiskeen: But the sun has risen every morning for millions of years. Of course it was going to rise this morning as well.

Pluck: There’s no reason to suppose it will rise tomorrow, either. In fact, it’s just as sensible to expect that a huge million-mile-wide bowl of tulips will appear over the horizon instead.

MacCruiskeen: I agree we can’t be *certain* the sun will rise tomorrow. Some cataclysmic event might destroy the earth before then. But it’s very *unlikely*

that anything like that will happen. The *probability* is that the sun will rise, surely?

Pluck: You misunderstand me. I'm not just saying we can't be certain the sun will rise tomorrow. I'm saying *we have no more reason to suppose that it will rise than we have to suppose that it won't*.

MacCruiskeen: That's absurd. The evidence – such as the fact that the sun has risen every morning for millions of years – overwhelmingly supports my belief that the sun will rise tomorrow, too.

Pluck: You're mistaken.

Pluck's position might seem ridiculous. But Hume has an argument that appears to show that she's right. Not only is our belief that the sun will rise tomorrow wholly unjustified, but so, too, are all our scientific theories.

Before we look at Hume's argument, I need briefly to explain the difference between deductive and inductive reasoning.

Thinking tools: inductive and deductive reasoning

An *argument* consists of one or more claims or *premises* and a *conclusion* arranged in such a way that the premises are supposed to *support* the conclusion. Arguments come in one of two forms: *Deductive* and *inductive*.

1. Deductive arguments

Here is an example of a deductive argument:

All cats are mammals.
My pet is a cat.
Therefore my pet is a mammal.

Two things are required for a good deductive argument. First of all, the premises must be true. Secondly, the argument must be *valid*. The expression 'valid', in this context, means that the premises must *logically entail* the conclusion. In other words, to assert the premises but to deny the conclusion would be to involve oneself in a *logical contradiction*. The above argument is valid. A person who claims that all cats are mammals and that their pet is a cat but who also denies that their pet is a mammal has contradicted him or herself.

2. Inductive arguments

Suppose you observe a thousand swans and discover them all to be white. You don't come across any non-white swans. Then surely you have pretty good reason to conclude that all swans are white. You might reason like this:

Swan 1 is white.
Swan 2 is white.
Swan 3 is white.

Swan 1,000 is white.
Therefore all swans are white.

This is an example of an inductive argument. Inductive arguments differ from deductive arguments in that their premises are supposed to *support*, but *not* logically entail, their conclusions. The above argument is not, and is not intended to be, deductively valid. To assert that the first thousand swans examined are white but that not *all* are white is not to contradict oneself (in fact, not all swans *are* white: there are black swans from New Zealand). Nevertheless, we suppose that the fact that if all the swans we have observed so far are white, then that makes it *more likely* that all swans are white. The premises *support* the conclusion. We believe that an argument can justify belief in its conclusion, despite not providing a logical guarantee that if the premises are true then the conclusion will be.

WHY IS INDUCTION IMPORTANT?

We rely on inductive reasoning in arriving at beliefs about what we have not observed, including, most obviously, our beliefs about what will happen in the future. Take, for example, my belief that the next time I sit in a chair it will support my weight. How is this belief justified? Well, I have sat in a great many chairs and they have always supported my weight before. That leads me to think it likely that the next chair I sit in will support my weight, too.

But notice that the statement that all the chairs I have ever sat in have supported my weight does not *logically entail* that the next chair will. There is no *contradiction* in supposing that even though I have never before experienced a chair collapse beneath me, that is what's about to happen.

But it then follows that I can't justify my belief that the next chair will not collapse by means of a *deductive* argument from what I have observed. So *if my belief is justified at all, it must be by means of an inductive argument.*

Science is heavily dependent on induction. Scientific theories are supposed to hold *for all times and places*, including those we have not observed. Again, the only evidence we have for their truth is what we have observed. So, again, we must rely on inductive reasoning to justify them.

THE UNJUSTIFIED ASSUMPTION

We have seen that inductive reasoning is important. Science depends on it. If it can be shown that inductive reasoning is wholly irrational, that would be a catastrophic result. Yet that's precisely what Hume believes he can show.

Let's return to Hume's argument. Hume believes it is no more rational to suppose the sun will rise tomorrow than it is to suppose that it won't. Hume's argument, in essence, is simple: it's that *induction rests on a wholly unjustified and unjustifiable assumption.* What is this assumption? Pluck proceeds to explain.

Pluck: Your belief that the sun will rise tomorrow is irrational. Hume explained why. Whenever you reason to a conclusion about what you haven't observed, you make an *assumption*.

MacCruiskeen: What assumption?

Pluck: You assume that *nature is uniform*.

MacCruiskeen: What do you mean?

Pluck: I mean you assume that those patterns that we have observed locally are likely to carry on into those portions of the universe that we haven't observed, including the future and the distant past.

MacCruiskeen: Why do I assume that?

Pluck: Well, put it this way: if you *didn't* believe that nature is uniform, then the fact that the sun has, in your experience, risen every day *wouldn't* lead you to expect it to continue to rise, would it?

MacCruiskeen: I guess not.

Pluck: So you see – *it's only because you assume nature is uniform that you conclude that the sun will continue to rise in the future*.

It appears that Pluck is right. Whenever we reason inductively, we make an assumption about the uniformity of nature. We assume that the universe is patterned throughout in just the same way.

Imagine an ant sitting in the middle of a bedspread. The ant can see that its bit of the bedspread is paisley-patterned. So the ant assumes the rest of the bedspread – the bits it can't see – are paisley-patterned, too. But why assume this? The bedspread could just as easily be a patchwork quilt. The bedspread could be paisley here, but plaid over there and polka-dotted over there. Or perhaps, just over the ant's horizon, the print on the bedspread turns to a chaotic mess, with blobs, lines and spots muddled up quite randomly.

We are in a similar position to the ant. The universe could also be a huge patchwork, with local regularities, such as the ones we have observed – the sun rising every day, trees growing leaves in the spring, objects falling when released, and so on – but no *overall* regularity. Perhaps the universe becomes a chaotic mess just over the horizon, with events happening entirely randomly. What reason have we to suppose this isn't the case? As Pluck is about to explain, it seems we have none.

Pluck: So the problem is this: unless you can *justify* your assumption that nature is uniform, your use of induction is itself unjustified. But then so, too, are all those conclusions based on inductive reasoning, including your belief that the sun will rise tomorrow.

MacCruiskeen: True.

Pluck: So how do we *justify* the assumption that nature is uniform?

We have just two options: we can either appeal to *experience* – to what you have observed – or you might try to justify the assumption *independently of experience*. MacCruiskeen is happy to admit that we cannot know that nature is uniform without observing nature.

MacCruiskeen: Obviously, we can't know independently of experience that nature is uniform.

Pluck: I agree. Our five senses – sight, touch, taste, hearing and smell – provide our only window on the world. Our knowledge of nature is dependent on their use.

MacCruiskeen: True.

Pluck: Which means that, if the assumption that nature is uniform is to be justified at all, it must be by appeal to what we have *experienced* of the world around us.

MacCruiskeen: Yes. But *isn't* the claim that nature is uniform justified by experience?

Pluck: No. To say that nature is uniform is to make a claim about what holds for *all* times and places.

MacCruiskeen: True.

Pluck: But you can't directly observe *all* of nature, can you? You can't observe the future. And you can't observe the distant past.

MacCruiskeen: Also true.

Pluck: But then your justification of the claim that nature is uniform must take the following form. You observe nature is uniform *around here* at the *present time*. Then you *infer* that nature is also like that at all those other times and places. Correct?

MacCruiskeen: I suppose so.

Pluck: But that is *itself* an inductive argument!

MacCruiskeen: Yes, it is.

Pluck: Your justification is, therefore, *circular*.

Here we reach the nub of Hume's argument. It seems that, if it can be confirmed at all, the assumption that nature is uniform can only be confirmed by observing that nature is uniform *around here* and then concluding that this is what it must be like *overall*.

But such a justification would itself be inductive. We would be using precisely the form of reasoning we're supposed to be justifying. Isn't there something unacceptably circular about such a justification?

THE CIRCULARITY PROBLEM

Pluck certainly thinks so.

MacCruiskeen: What is the problem with the justification being circular?

Pluck: Look, imagine that I think The Great Mystica, the psychic who works at the end of the pier, is a reliable source of information.

MacCruiskeen: That would be very foolish of you!

Pluck: But suppose my justification for trusting The Great Mystica is that she claims to be a reliable source of information. I trust her because she says she's trustworthy.

MacCruiskeen: That would be no justification at all! You need some reason to suppose that The Great Mystica is trustworthy *before* you trust her claim that she is.

Pluck: Exactly. Such a justification would be unacceptably circular because it would *presuppose* that The Great Mystica was reliable.

MacCruiskeen: I agree.

Pluck: But your attempt to justify induction is unacceptable for the very same reason. To justify induction you must first justify the claim that nature is uniform. But in attempting to justify the claim that nature is uniform you rely on induction. That won't do. You're just *presupposing* that induction is reliable.

We can now sum up Hume's extraordinary argument. All inductive reasoning, it seems, relies on the assumption that nature is uniform. How, then, might this assumption be justified? Only by experience, surely. But we cannot *directly observe* that nature is uniform. So we must *infer* that it is uniform from what we have directly observed: that is, from a *local* uniformity. But *such an inference would itself be inductive*. Therefore we cannot justify the assumption. So our trust in induction is unjustified.

'BUT INDUCTION WORKS, DOESN'T IT?'

Perhaps you're not convinced. You might suggest that there is one very obvious difference between, say, trusting induction and trusting The Great Mystica. For induction *actually works*, doesn't it? It has produced countless true conclusions in the past. It has allowed us successfully to build super-computers, nuclear power-stations and even to put a man on the moon. The Great Mystica, on the other hand, may well have a very poor track record of making predictions. That's why we are justified in believing that induction is a reliable mechanism for producing true beliefs, whereas trusting The Great Mystica is not.

The problem, of course, is that this is itself an example of inductive reasoning. We are arguing, in effect, that induction has *worked until now*, and therefore induction will continue to work. Since the reliability of induction is what is in question here, it seems that this justification is, again, unacceptably circular. It is, after all, just like trying to justify trust in the claims of The Great Mystica by pointing out that she herself claims to be reliable.

AN ASTONISHING CONCLUSION

The conclusion to which we have been driven is a sceptical one. Sceptics claim that we do not know what we might think we know. In this case the scepticism concerns *knowledge of the unobserved*. Hume and Pluck seem to have shown that we have no justification for our beliefs about the unobserved, and thus no *knowledge* of the unobserved.

Hume's conclusion is a fantastic one. It's a good test of whether someone has actually understood Hume's argument that they acknowledge its conclusion is fantastic (many students new to philosophy misinterpret Hume: they think his conclusion is merely that we cannot be *certain* what will happen tomorrow). In fact, so fantastic is Hume's conclusion that MacCruiskeen cannot believe that Pluck is really prepared to accept it.

MacCruiskeen: You're suggesting that what we've observed to happen so far gives us *no clue at all* as to what will happen in the future?

Pluck: Yes. Things *may* continue in the same manner. The sun may continue to rise. Chairs may continue to support our weight. But we have *no justification whatsoever* for believing any of these things.

MacCruiskeen: Let me get this straight. If someone were to believe that it's just as likely that a huge bunch of tulips will appear over the horizon tomorrow morning, that chairs will vanish when sat on, that in future water will be poisonous and objects will fall upwards when released, we would ordinarily think them *insane*. Correct?

Pluck: Yes, we would.

MacCruiskeen: But if you're right, these 'insane' beliefs about the future are actually just as well supported by the available evidence as is our 'sensible' belief that the sun will rise tomorrow. Rationally, we should accept that these 'insane' beliefs are actually just as likely to be true!

Pluck: That's correct.

MacCruiskeen: You *really* believe that? You really believe it's just as likely that a million-mile-wide bowl of tulips will appear over the horizon tomorrow morning?

Pluck: Well, actually, no, I don't.

MacCruiskeen: Oh?

Pluck: I do believe the sun will rise tomorrow. For some reason, I *just can't help myself*. I see that, *rationally*, I *shouldn't* believe. But while I realise that my belief is wholly irrational, I can't stop believing.

HUME'S EXPLANATION OF WHY WE BELIEVE

Like Pluck, Hume admitted that we *can't help* but believe that the sun will rise tomorrow, that chairs will continue to support our weight, and so on. In Hume's view, our minds are so constituted that when we are exposed to a regularity, we have no choice but to believe the regularity will continue. Belief is a sort of involuntary, knee-jerk response to the patterns we have experienced.

Thinking tools: reasons and causes – two ways of explaining *why* people believe what they do

Hume's explanation of why we believe that the sun will rise tomorrow does not, of course, give us the slightest reason to suppose that this belief is actually *true*.

It is useful to distinguish two very different ways in which we can 'give the reason' why someone believes something. We may give the *grounds* or *evidence* that a person has for holding a belief. Or we may explain what has *caused* this person to believe what they do.

It's important to realise that *to offer a causal explanation of a belief is not necessarily to offer any sort of rational justification for holding it*. Consider these explanations:

Tom believes he is a teapot because he was hypnotised during a stage act.

Anne believes in fairies because she is mentally ill.

Geoff believes in alien abduction because he was indoctrinated by the Blue Meanie cult.

These are purely causal explanations. To point out that someone believes they are a teapot because they were hypnotised into having that belief during the course of a hypnotist's routine is not to provide the slightest grounds for supposing that this belief is true.

The following explanation, on the other hand, gives the subject's grounds for belief (which is not yet to say they are good grounds):

Tom believes in astrology because he finds that newspaper astrology predictions are quite often correct.

Interestingly, ask the hypnotised person why they believe they are a teapot and chances are they will be unable to answer. The correct *causal* explanation is unavailable to them (assuming they don't know they have been hypnotised). But nor will they be able to offer a convincing *justification* for their belief. They may simply find themselves 'stuck' with a belief that they may themselves recognise is irrational.

Hume admits that, similarly, his explanation of why we believe the sun will rise tomorrow does not supply the slightest grounds for supposing that the belief is true. Indeed, we have no such grounds. It is, again, a belief we simply find ourselves stuck with.

CONCLUSION

If Hume is right, the belief that the sun will rise tomorrow is as unjustified as the belief that a million-mile-wide bowl of tulips will appear over the horizon instead. We suppose the second belief is insane. But if Hume is correct, the first belief is actually no more rational. This conclusion strikes us as absurd, of course. But Hume even explains *why* it strikes us as absurd: we are made in such a way that we *can't help* but reason inductively. We can't help having these irrational beliefs.

Hume's argument continues to perplex both philosophers and scientists. There's still no consensus about whether Hume is right. Some believe that we

have no choice but to embrace Hume's sceptical conclusion about the unobserved. Others believe that the conclusion is clearly ridiculous. But then the onus is on these defenders of 'common sense' to show precisely *what* is wrong with Hume's argument. No one has yet succeeded in doing this (or at least no one has succeeded in convincing a majority of philosophers that they have done so).