INTRODUCTION

A few years ago I was invited to debate with a scientist – Professor Peter Atkins – on the value of philosophy. Atkins argues that philosophy is entirely pointless. Here's what I had to say in its defence. Do you agree?

I am a philosopher. So it will come as no surprise to you that I am going to argue that philosophy is:

(i) a worthwhile activity, and that
(ii) for many of the most baffling and important questions and puzzles, the armchair method of the philosopher, rather than the scientific method, is the right approach to adopt.

Many will of course question this. How, they will ask, can you discover anything of significance from the comfort of your armchair? To find out anything about the world you need to *observe* it. You need to collect data, perform experiments, and so on. That's just what philosophers don't do. So philosophy is a waste of time. Or so concludes Peter Atkins.

Well, I agree that if you want to find out about how things stand out there in the world, the scientific method is indeed the best method to adopt. You are not going to discover much about reality sitting in your armchair, with your eyes closed, having a think.

But, actually, that's not to say that every significant question or puzzle is best answered or solved by the methods of science. Some of the most baffling puzzles and questions are puzzles and questions that would appear to lie outside the remit of science and empirical investigation.

Here's a simple example. You probably look into a mirror every day. They are familiar everyday objects. And yet they generate a baffling philosophical conundrum – one that

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baffled Plato back in Ancient Greece, and which philosophers are still writing about today.

The puzzle is this: why do mirrors reverse left to right, but not top to bottom?

You might think – this is just a *scientific* question. If we get in all the data and find out how light behaves, including how it is reflected off a mirror, then we'll have the answer. But actually, even when all the scientific facts about how light behaves are in, the puzzle remains. Light bounces of mirrors the same way whether it comes in top to bottom or left or right.

The correct theory of how mirrors reflect light provides no solution at all to the mirror puzzle. In fact, the puzzle could have been solved by Plato, thousands of years ago, despite his not knowing our modern theories about light.

So what is the solution? I think that something like this is correct.

Why do we say the mirror reverses left to right? Because when we imaginatively place ourselves where the mirror version of ourselves appears, we see that the mirror person's left hand is where our right hand is, and vice versa. Yet our head and feet remain top and bottom.

But what if you place yourself where the mirror person appears not to be rotating yourself around a vertical axis, but on a horizontal axis? Then your feet would be where your head appears and vice verse, whereas your left hand would remain where your left hand appears.

In short, mirrors only reverse left to right if we take for granted a vertical axis of rotation. Take a horizontal axis, and mirrors reverse top to bottom not left to right.

Compare doors – pass through a door with the hinge on the left and when you return the hinge is on the right. But if you pass through a door that opens like a cat flap – at the top – it still opens at the top when you turn round and pass through the door again. Why do door hinges reverse left–right, but not top–bottom? What explains this asymmetry? The fact that we take for granted one axis of rotation over another. Normally, we return through a door by

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rotating on a horizontal axis. But in the weightless environment of space it would be as easy to flip on a horizontal axis. If you did, the door that opened at the top would now open at the bottom.

These asymmetries are generated by what we take for granted – one axis of rotation over another.

So it seems to me that the mirror puzzle:

(i) is not a puzzle that can be solved by empirical research.
(ii) is a kind of logical or conceptual puzzle that requires a logical/conceptual solution. It's a puzzle that takes armchair reflection to solve.

So not every puzzle is one best solved by empirical investigation. In fact, some of the deepest and most baffling puzzles can, in fact, *only* be solved by armchair reflection.

In fact, all sorts of interesting discoveries can be made from the armchair. Mathematical discoveries, for example, can be made from the armchair. They can be achieved by pure thought alone – without doing any data collection or laboratory experiments.

We can also rule out certain hypothesis about the world from the comfort of the armchair.

Suppose an explorer claims to have discovered a four-sided triangle on their travels. Should we mount an expedition to go and check whether this momentous claim is correct? Of course not. We can figure out, from the comfort of our armchairs, that no such triangle exists. Triangles, by definition, have three sides. So a four-sided triangle involves a contradiction. It cannot possibly exist.

This is a rather obvious example. It's obvious that four-sided triangles are ruled out conceptually. They involve a logical contradiction. But sometimes what is ruled out conceptually is not so obvious.

Aristotle claimed that objects of different mass will fall at different speeds. A large, heavy metal ball will fall faster than a small, light metal ball.

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Back in the late sixteenth century, Galileo showed that Aristotle was wrong. Some say he did this by dropping two balls off the top of the leaning tower of Pisa. The two balls landed at the same time. David Scott did the experiment with a feather and hammer on the Moon.

But actually, Galileo probably didn't perform that experiment. He actually performed a thought experiment – one that he describes in his book *On Motion*. And of course thought experiments can be run from the comfort of our armchairs.

Galileo reasoned like so. Imagine two balls, one heavier than the other, connected by a string. Drop this system of objects from the top of a tower. If we assume heavier objects do indeed fall faster than lighter ones (and conversely, lighter objects fall more slowly), the string will soon pull taut as the lighter ball drags on and slows the fall of the heavier ball. But the system considered as a whole is heavier than the heavy ball alone, and therefore should fall faster than the heavy ball on its own. So Aristotle's theory, just like the claim that there exists a four-sided triangle, generates a contradiction. Galileo could establish that it is false from the comfort of his armchair.

True, this is a scientist doing a scientific thought experiment, but it illustrates the point that highly significant discoveries can indeed be made from the armchair.

Of course, philosophers need to be scientifically literate. Scientific discoveries can be of philosophical relevance. But, at heart, philosophy is an *armchair* discipline. And it is none the worse for that.

Philosophy is about conceptual investigation and clarification. Philosophers make conceptual discoveries. I have illustrated how they tackle conceptual puzzles – puzzles that the scientific method just isn't equipped to solve.

They also probe what we take for granted, our commonsense assumptions, sometimes with dramatic results. Philosophers may reveal that what we believe has quite shocking unacknowledged consequences, for example.

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This can lead to important breakthroughs, particularly in moral philosophy. Many of the most important developments over the last couple of hundred years or so have come about because of philosophical reflection – questioning of, and thinking through the consequences of, some of our most basic moral assumptions and principles.

Where I agree with Peter Atkins is that armchair reflection *alone* is unlikely to reveal anything about the world outside our own minds. That external reality is best investigated empirically. But there are important questions and puzzles that empirical, scientific methods can't answer or solve – questions and puzzles that can only be answered by armchair methods.

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