Empiricism on the limits of knowledge

HUME’S ‘FORK’
Hume argues that we can have knowledge of just two sorts of thing: the relations between ideas and matters of fact (An Enquiry concerning Human Understanding, §4, Part 1). By relations of ideas, Hume means propositions such as ‘All sons have fathers’ (about the ideas ‘son’ and ‘father’) and ‘If A is longer than B, and B is longer than C, then A is longer than C’ (about the idea of length). His distinction was developed by later philosophers, and is now understood in terms of the two distinctions analytic/synthetic and a priori/a posteriori. In effect, Hume argued that all a priori knowledge (relations of ideas) must be analytic, while all knowledge of synthetic propositions (matters of fact) is a posteriori. In other words, anything we know that is not true by definition, every ‘matter of fact’, we must learn and test through our senses.

‘Matters of fact’
The foundation of knowledge of matters of fact, Hume argues, is what we experience here and now, or can remember. All our knowledge that goes beyond what is present to our senses or memory, he claims, rests on causal inference. If I receive a letter from a friend with a French postmark on it, I’ll believe that my friend is in France – because I infer from the postmark to a place. I do this because I think that where something is posted causes it to have the postmark of that place; and if the letter was posted by my friend, then I believe that he is in France.

And how do I know all this? I rely on past experience – in the past, I have experienced letters being posted, I have seen different postmarks, I have found that postmarks relate to where you post something, and so on. I can’t work out what causes what just by thinking about it. It is only our experience of effects following causes that brings us to infer from the existence or occurrence of some cause to its effect, or from some effect to its cause.

Does this give me complete certainty? Is this a proof that the letter was posted in France? No, says Hume: knowledge of matters of fact, beyond what we are experiencing here and now, relies on induction and reasoning about probability.

INDUCTION AND DEDUCTION
An inductive argument is an argument whose conclusion is supported by its premises, but is not logically entailed by them, i.e. if the premises are true, the conclusion is likely to be true. A letter with a French postmark was most likely posted in France, because most letters (all so far?) with French postmarks were in fact posted in France. This is induction through ‘inference to the best explanation’.

Another famous example of an inductive argument, induction through ‘enumeration’, is this:
Premise 1: This swan is white.
Premise 2: This other swan is white.
Premise 3: That third swan is white.
...
Premise 500: That swan is white as well.
Conclusion: All swans are white.

A deductive argument is an argument whose conclusion is logically entailed by its premises, i.e. if its premises are true, the conclusion cannot be false. Here is a famous example:

Premise 1: Socrates is a man.
Premise 2: All men are mortal.
Conclusion: Socrates is mortal.

AYER’S VERIFICATION PRINCIPLE
In the 1930s, an empiricist school of philosophy called logical positivism developed a modern, linguistic version of Hume’s division of knowledge into two kinds. The ‘principle of verification’ states that a statement only has meaning if it is either analytic or empirically verifiable. A J Ayer explains: A statement is empirically verifiable if empirical evidence would go towards establishing that the statement is true or false (Language, Truth and Logic, Ch. 1). For example, if I say ‘the moon is made of green cheese’, we can check this by scientific investigation. If I say ‘the universe has 600 trillion planets’, we can’t check this by scientific investigation in practice, but we can do so in principle. We know how to show whether it is true or false, so it is ‘verifiable’ even though we can’t actually verify it. And like Hume, Ayer argued that empirical hypotheses are only ever more or less probable, never completely certain. So ‘verification’ does not mean ‘proof’; it only requires that empirical evidence can raise or reduce the probability that a statement is true.

The principle is intended to be a criterion for meaningful statements, and it enabled logical positivists to reject as nonsense many traditional philosophical debates. Philosophy doesn’t give us knowledge of a reality that transcends the investigations of science. It is not a source of speculative truth.

Rejecting the verification principle
The verification principle has since been rejected by philosophers as an inadequate account of what it is for a statement to have meaning. The main difficulty is that according to the principle of verification, the principle of verification itself is meaningless! The statement that ‘a statement only has meaning if it is analytic or can be verified empirically’ is not analytic and cannot be verified empirically. But if the principle of verification is meaningless, then what it claims cannot be true. So it does not give us any reason to believe that the claims of ethics are meaningless.

Ayer claims that the principle is not intended as an empirical hypothesis about meaning, but a definition, though not an arbitrary one. In other words, it is intended to reflect upon and clarify our understanding of ‘literal meaning’. He accepts that the verification principle isn’t obviously an accurate criterion of ‘literal meaning’, but that is why he provides arguments in specific cases – ethics, religion, a priori knowledge – which support it.
But to this, we may respond by rejecting both his specific arguments and the verification principle. The verification principle is only as certain as the arguments that are intended to exemplify the consequences of its application. If we do not find those convincing, the principle provides no independent support.

**MATHEMATICAL KNOWLEDGE**

Mathematical knowledge has often been taken to challenge the empiricist division of knowledge into analytic a priori and synthetic a posteriori. It is difficult to argue that mathematical knowledge is a posteriori. If we say that $2 + 2 = 4$ is just a generalization of our experience so far, then as Hume argued, this ‘matter of fact’ is not certain, but only probable: we are saying that one day, perhaps, $2 + 2$ will equal some other number. But this is unimaginable (2 apples in one hand, 2 apples in the other, but only 3 apples in total?? How?).

But empiricists can accept that mathematical knowledge is a priori, if they also argue (which they do) that it is analytic: All mathematical knowledge is reached by developing a series of definitions. But if this is true, how are mathematical ‘discoveries’ possible? How can we ‘discover’ something that is true by definition? Empiricists reply that analytic knowledge doesn’t need to be obvious; mathematical truths are very complex, so it takes work to establish that they are true. But that doesn’t mean they are not true by definition.

**Geometry**

This reply can be difficult to believe. For example, truths of geometry don’t seem to be true by definition. The fact that it takes at least three straight lines to enclose a space in two-dimensions seems to be a truth about the nature of space, rather than the concept of space. Yet it has mathematical certainty, and can be proved by mathematical geometry. How could such certainty come from sensory experience alone?

In fact, there is more than one geometry of space. It is in classical, or Euclidean, geometry that it takes three straight lines to enclose a two-dimensional space. But mathematicians have worked out perfectly good, consistent non-Euclidean geometries in which this and other ‘truths’ are not true (if you curve the two-dimensional plane, e.g. the surface of the Earth, you can enclose a space with two straight lines). So, empiricists argue, geometry applied to the real world has two elements: a series of definitions, which are analytic truths; and then an a posteriori claim about which type of geometry applies to space. So there are geometrical truths about the nature of space, but they are not necessary – space could have been otherwise, e.g. non-Euclidean. In fact, in some cases in advanced physics, Euclidean geometry does not describe space accurately.

**An empiricist response**

In the twentieth-century, empiricists such as Bertrand Russell argued that although mathematical truths were not analytic, they were nevertheless ‘logical’ truths. His argument depended on technical developments in logic and in mathematics. Philosophers still disagree about the success of Russell’s attempt – and attempts by other philosophers since – to reduce mathematics to logical truths. It is fair to say that while some attempts are promising, no reduction has been completed.