Chapter 2

Empiricism

Introduction

In his 1783 *Prolegomena to Any Future Metaphysics,* which was intended as an after-the-fact introduction to his monumental 1781 *Critique of Pure Reason,* Immanuel Kant wrote: "I openly confess my recollection of David Hume was the very thing which many years ago first interrupted my dogmatic slumber and gave my investigations in the field of speculative philosophy a quite new direction" (Kant, 1783/1950: 8). Kant went on to write that Hume "certainly struck a spark by which light might have been kindled had it caught some inflammable substance and had its smouldering fire been carefully nursed and developed" (Kant, 1783/1950: 5). What was it that Hume wrote that shook Kant so deeply, spurring Kant to divert from his previously solid but not particularly distinguished career as a philosopher of metaphysics to undertake a comprehensive examination—or "critique"—of the human faculties of pure reason, practical reason, and judgment? It was Hume's analysis of cause and effect, or, more specifically, Hume's argument that we do not, and cannot, have actual knowledge regarding causation.

Causation

How can we know whether one thing is the cause of another? Suppose I say that smoking causes cancer, that my striking a bell with a hammer causes the sound, or that raising the mandatory minimum wage will cause unemployment. We all have innumerable *beliefs* about causal relationships, including perhaps these; but how do we *know?* How can we be sure that when we say that A causes B, it is in fact A that caused B? How can we know that B did not merely follow A but was unconnected to A, or that B was not in fact caused by some perhaps

unobserved or unknown C? This turns out to be a more complicated question than one might initially suppose. Many things might be correlated, for example, without having any causal relationship. For example, as seatbelt-wearing in automobiles increased during the 1980s and 1990s, deaths of astronauts in spacecraft decreased; but that does not mean that my wearing a seatbelt will save an astronaut's life. Similarly, the death rate in hospitals is higher than the death rate outside of hospitals; but that does not mean that hospitals kill people—rather, that is where people who are dying often go.

What Hume noticed was that our "causal" inferences often take the following route: we see A happen, and then we see B happen, from which we infer that A caused B. Now, it is a familiar fallacy to assume that just because one thing happens after another thing, therefore the earlier thing caused the later thing.[7] Robert F. Kennedy was assassinated on June 4, 1968; a few days later, I was born—but of course Kennedy's assassination did not cause my birth. That is an easy inference to refute, but Hume wants to take an even harder case. Suppose that *every* time A occurs, B follows; let us even suppose that every time A occurs, B follows *immediately.* Should we therefore infer that A is the cause of B? Even in such a case, Hume reasoned, the conclusion is not certain. The reason, he thought, was because we do not actually perceive the causal mechanism. What we perceive instead is a conjunction of events, A and (then) B. We might even perceive the two to be "constantly conjoined" (E1 4.1.23: 27). What we do not perceive, however, is the causal link itself. What is transferred between the two events? What are the "secret powers" (E1 4.2.29: 34) that causes have to bring about their effects? We assume there is a connection; we might even assume that there must be a connection. But consider: Is it possible that the next time A happens, B does not? Not whether we think it is likely or probable that B will not ensue after A; is it *possible?*

To illustrate, Hume asks: Will the sun rise tomorrow? (E1 4.1.21: 25–6). If we are asked this question, we will answer, "Yes, of course." But is it possible that something, however improbable, could happen that would prevent the sun from rising tomorrow? If so, then we cannot be absolutely certain that it will rise tomorrow. And, yes, it is possible that something might happen that would prevent the sun from rising tomorrow; hence, we cannot be certain

7 This is called the *post hoc ergo propter hoc* (or, "after this, therefore because of this") fallacy.

that it will. Now, none of us would, or should, expect that the sun will not rise tomorrow. But what is the basis of our confidence? It is because every previous day in the history of the world (at least as far as we know), the sun has risen. On the basis of uncontradicted past experience, we instinctively form to ourselves the inferential rule that whatever has always happened in the past will happen again in the future. But then it is the instinct that leads us to the conclusion, not a rational argument. Thus, what we considered causal reasoning is instead psychological instinct based on past experience.

Compare the following two arguments. Argument 1: All men are mortal; Socrates is a man; therefore, Socrates is mortal. This argument is logically valid, which means that if the premises are true, then the conclusion must also be true. That is, if it is the case that all men are mortal, and if it is the case that Socrates is (or was) a man, then it must be the case that Socrates too is mortal. This argument is called a deductive syllogism:

Premise 1:	All *s* are *p*. (All men are mortal.)
Premise 2:	*X* is *s*. (Socrates is a man.)
Conclusion:	Therefore, *x* is *p*. (Therefore, Socrates is mortal.)

Consider, however, the following Argument 2: We have observed many swans; all of those we have observed are white; therefore, all swans are white. Is this argument valid? That is, if the premises ("we have observed many swans" and "all of them are white") are true, must the conclusion ("all swans are white") also be true? Well, no. Perhaps we have not observed all the swans there are, for example. And, in fact, it turns out that there are rare black swans. The inference that all swans are white is an inductive, not a deductive, conclusion, and the confidence we should have in it is proportional to the evidence—but is never conclusive. If we had observed only one swan, and it was white, then the confidence we should have in the conclusion "all swans are white" should be very low; if we had observed one million swans, and all of them were white, then we should have higher confidence in the conclusion "all swans are white." Until we had observed literally every single swan there is, however, we could not have perfect confidence in the conclusion.

Now, why go through all this? Because it turns out that science is based on induction, and hence on inferences made on the basis of past experience.

Even if we have made accurate observations of past events, all that we could thereby conclude with certainty is that this is how things were *in the past.* But science is not only about describing the past; it is about predicting the future as well. We want to know not only how gravity worked in the past but how it will work the next time we launch a space shuttle. We want to know not just how penicillin interacted with bacteria in the past but how it will affect the next infection we get. Here is where Hume's question becomes acute: how do we know that what happened in the past—even what happened consistently in the past—will also happen in the future? In practice, he reasoned, we merely assume that whatever held consistently in the past will (therefore) hold consistently in the future. And perhaps it will. But what is the basis on which we believe that what happened in the past will happen in the future? Because that is what happened in the past! Therefore, that belief too is based on our past experience. So, what can give us confidence about the future? What indeed. It was the realization that Hume's argument effectively called all scientific knowledge into question that shook Kant and woke him from his dogmatic slumber.

Empiricism

Hume's philosophical methodology can be described as "empiricism." Unlike many philosophers before Hume and since, he was skeptical that we could learn about the world by merely thinking about it. We needed to observe it. We must run experiments; we must gather and assess data; we must measure and quantify. We make tentative hypotheses, and then test them against further observations. For Hume, this holds as much for physical sciences—how things move in the world, how chemicals interact, what materials should be used and how they should be configured to build bridges—as it did for the human sciences—how medicines affect us, how our passions motivate us, how our beliefs are formed, where our moral sentiments come from, what governments do or should do, where wealth comes from.

Hume justified his methodology in three steps. Step one: "'Tis evident, that all the sciences have a relation, greater or less to human nature, and that however wide any of them may seem to run from it, they still return back by one passage or another" (T Intro.4: 4). Step two: "If therefore the sciences of Mathematics, Natural Philosophy, and Natural Religion, have such

a dependence on the knowledge of man, what may be expected in the other sciences, whose connexion with human nature is more close and intimate?" (T Intro.5: 4). And, finally, step three: "as the science of man is the only solid foundation for the other sciences, so the only solid foundation we can give to this science itself must be laid on experience and observation" (T Intro.7: 4). What Hume called the "experimental philosophy" (T Intro.7: 4) that worked so well for Newton and allowed him to take such great strides in understanding the operations and effects of gravity could perhaps, Hume argued, also help us create a "science of man," providing a foundation for understanding human nature, morality, politics, law, and even religion.

It was in the area of religion that got Hume into hot water. Hume lived in a religious age in which, despite various—even bloody—conflicts about doctrine, one widespread belief was that God's existence and nature could be ascertained and demonstrated through *a priori* argument. That is, we could prove that God exists by mere operation of reason, the way we could prove that the interior angles of a triangle are equal to two right angles. Similarly, we could demonstrate the necessary attributes of God, including His omniscience, omnipotence, and omnibenevolence. Even further, we could demonstrate numerous aspects of God's will and our moral duties to God, to each other, and to ourselves, based on similar logical reasoning—that is, without relying on empirical observation. In other words, we did not need to conduct empirical experiments to know about God; we could look to our minds, or hearts, and prove through pure reason everything there was to know.

Hume overturned that view by arguing that human knowledge is limited by and dependent on experience. We can know where the stone will fall when we throw it because we have seen it thrown before and observed; we can know what the effect of alcohol will be on those who drink it because we have seen it before and observed; we can know what will happen to the billiard ball when I strike it with the cue stick because we have seen it before and observed. But Hume makes an even bolder claim. We can know these things in *no other way* than by observation. That means that if we have no relevant experience or observations, we can have no knowledge, only idle speculation. If we have only few observations, we can formulate hypotheses, but we cannot have much confidence in them.

What, then, are the faculties humans have at their disposal to learn about the world, and what kinds of things can be known by them? "All the objects of human reason or enquiry may naturally be divided into two kinds, to wit, *Relations of Ideas,* and *Matters of Fact*" (E1 4.1.20: 25). And human beings have, according to Hume, only two paths available to knowledge: *a priori* and *a posteriori* reasoning, which apply to "relations of ideas" and "matters of fact," respectively. *A priori* reasoning relates to what we can know with certainty but that is not based or reliant on experience. Examples of proper *a priori* reasoning are geometry, (pure) mathematics, and deductive logic. We can know the properties of a triangle, for example, without measuring triangles; we can know that the limit of $1/n^x$ as x approaches infinity is zero, without making any empirical observations; we can know that all bachelors are unmarried males simply by knowing the definitions of the terms, and without having to survey all bachelors and asking them whether they are unmarried males.

By contrast, *a posteriori* reasoning, which applies to "matters of fact," relates to what we must consult experience and observation to know. How many people are there on the earth? What spectrum of light is visible to the human eye? What is the structure of DNA? Questions like these relate to the real existence of entities in the world, the way the world actually and in fact is. Here, Hume argued, our only available faculty for learning is empirical observation. To know how many people there are on the earth, we have to go out and count. To know what the structure of DNA is, we have to look and see. Aristotle (384–322 BC) and Ptolemy (c. AD 100–170) constructed sophisticated models of the universe, complete with arguments that everything must move in perfect circles (because that seemed agreeable to pure reason) and that the earth was at the center of everything (because that seemed agreeable to the grandeur of human beings). Their models were beautiful, but they were also false, as it turned out. How did we discover that they were false? By observation. Nicolaus Copernicus (1473–1543), Tycho Brahe (1546–1601), Galileo Galilei (1564–1642), Johannes Kepler (1571–1630), and others did what Hume suggested: they went out and looked. They made observations of movements, and found that things did not move in perfect circles; then they realized that observations could not be squared with the hypothesis that the earth was at the center of our solar system—but were remarkably consistent with an alternative

hypothesis, namely that the sun was at the center. That offended people's sense of rational propriety, not to mention their religious convictions that God would have put us at the center; but still, the observed data were what they were. As Galileo was reported, perhaps apocryphally, to have said upon exiting the Inquisition trial at which he was excommunicated, "and yet it moves"—in other words, I see your religious beliefs requiring the fixity and centrality of the earth, but, sorry, the earth still moves.

The test of whether any proposition falls into the category of "relations of ideas" as opposed to "matters of fact" is, according to Hume, whether the contrary of the proposition is possible. In other words, can one deny the proposition without creating a (logical) contradiction? If one can, then the proposition is likely a "matter of fact"; if one cannot—that is, if denying it is not conceivable or leads to a contradiction—then the proposition is a "relation of ideas." As examples, consider these two propositions: (1) "That three times five is equal to the half of thirty" (E1 4.1.20: 25); and (2) that the sun will rise tomorrow (E1 4.1.21: 25–6). If we deny proposition (1), it involves us in a contradiction: it would mean that a specific given number, 15, is both equal to itself and not equal to itself. By contrast, if we deny proposition (2), it involves us in no contradiction: that the sun will not rise tomorrow is "no less intelligible a proposition" than that it will rise (E1 4.1.21: 26). Thus, Hume concluded, the former is a "relation of ideas," and can be known by merely examining the relevant ideas themselves; the latter, on the other hand, is a "matter of fact," and can be known, if at all, only by empirical observation.

These two ways of understanding the world—*a priori* and *a posteriori*—thus have, according to Hume, their proper scopes and objects, and they should not be conflated. We should not try to rely on observation to know whether a deductive logical argument is valid; we should rely on the principles of logic themselves. And we should not use deductive logic to determine "matters of fact and existence"; we should rely instead on observation and experiment. As slow and uncertain as these latter are, they are all we have.

Hume's deflation of the powers of human reason went so far as to suggest that reason by itself is inert. Although it can reveal relations of ideas, and it can suggest to us the likely consequences of events based on past experience, Hume claimed that reason by itself cannot motivate us to do anything: "Reason

is, and ought only to be the slave of the passions, and can never pretend to any other office than to serve and obey them" (T 2.3.3: 266). Knowing the right thing to do, which reason might be able to ascertain, does not, according to Hume, equate to doing it: we need motivation to act, which only our passions can provide. For Hume, reason, "this little agitation of the brain" (D pt. 2: 19), was thus quite limited indeed.

The limits of reason apply to our religious beliefs as well. The claim that God exists is, Hume argues, a hypothesis about a matter of fact and existence. That is, either God exists in fact or He does not. Suppose we deny that God exists: does that involve us in a logical contradiction? No: the propositions "God exists" and "God does not exist" are, regardless of which one we believe, equally intelligible and readily understandable as propositions. That means, however, that by Hume's test a proposition about God's existence is a matter of fact, not a relation of ideas; and that means that it can be known only by empirical observation, not by mere operation of logic or reason.

"The existence, therefore, of any being can only be proved by arguments from its cause or its effect; and these arguments are founded entirely on experience. If we reason *a priori,* anything may appear to produce anything" (E1 12.3.132: 164). In other words, the only firm basis of knowledge our limited capacities have at their disposal regarding matters of fact is observation of past experience. Even that is still ultimately uncertain, however, because, as we have seen, Hume argues that we do not perceive causal mechanisms and have no capacity to understand the world other than by experience. If we have had no experience with God, then we can have no knowledge of Him—no more than the knowledge we could have of, say, alien populations on other planets. "It is only experience, which teaches us the nature and bounds of cause and effect, and enables us to infer the existence of one object from that of another. Such is the foundation of moral reasoning, which forms the greater part of human knowledge, and is the source of all human action and behaviour" (E1 12.3.132: 164). Hume concluded: "A wise man, therefore, proportions his belief to the evidence"; further, the wise man "proceeds with more caution: He weighs the opposite experiments: He considers which side is supported by the greater number of experiments: to what side he inclines, with doubt and hesitation; and

when at last he fixes his judgement, the evidence exceeds not what we properly call probability" (E1 10.1.87: 110–11).

To put an exclamation point on what Hume's argument does to religion, or more particularly to the relative confidence we can have in the various religious and metaphysical claims that theologians make, Hume ended his *Enquiry concerning Human Understanding* thus:

> When we run over libraries, persuaded of these [that is, Hume's] principles, what havoc must we make? If we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask, *Does it contain any abstract reasoning concerning quantity or number?* No. *Does it contain any experimental reasoning concerning matter of fact and existence?* No. Commit it then to the flames; for it can contain nothing but sophistry and illusion. (E1 12.3.132: 165)

Perhaps it is no wonder that Hume was viewed as a skeptic. His empiricism left him little basis on which to have confidence in the truth of religious claims or propositions about metaphysical or supernatural entities. Our cognitive capacities, Hume argued, are not sufficient to warrant certainty about matters of fact and existence because our capacities do not reach beyond our experience. We cannot know about the existence of things we have not observed, which includes "secret" causal mechanisms. "These ultimate springs and principles are totally shut up from human curiosity and enquiry" (E1 4.1.26: 30). Does that mean Hume was an atheist? Not quite: because a wise man "proportions his belief to the evidence," the Humean answer to the question of whether God exists should probably be something like: "There is insufficient evidence to know."

What does Hume's empirical method reveal, however, regarding other elements of human existence? What does, or can, it tell us, for example, about morality and justice? Let us turn to that in the next chapter.