

## CHAPTER ELEVEN

### THE HISTORY OF EPISTEMOLOGY: MODERN PHILOSOPHY

#### 11.1 The Rise of Modern Epistemology

For most of the middle Ages there was no distinction between theology and science (*scientia*). Science was knowledge that was deduced from self-evident principles, and theology was knowledge that received its principles from God, the source of all principles. By the 14th century, however, scientific and theological thinking began to diverge. Roughly speaking, theologians began to argue that human knowledge was narrowly circumscribed. The omnipotence of God was often invoked in order to undercut the pretensions of human reason, and in place of rationalism in theology they promoted a kind of fideism (i.e., a philosophy based entirely on faith).<sup>179</sup>

The Italian theologian Gregory of Rimini (died 1358) exemplified the development. Inspired by Ockham, Gregory argued that, whereas science concerns what is accessible to humans through natural means, that is, through sensation and intelligence, theology deals with what is accessible only in a supernatural way.<sup>180</sup> Thus, theology is not scientific. The role of theology is to explain the meaning of the Bible and the articles of faith and to deduce conclusions from them. Since the credibility of the Bible rests upon belief in divine revelation, theology lacks a rational foundation. Furthermore, since there is neither self-evident knowledge of God nor any natural experience of him, humans can have only an abstract understanding of what he is.

Ockham and Gregory did not intend their views to undermine theology. To the contrary, for them theology is in a sense more certain than science, because it is built upon principles that are guaranteed to be true by God, whereas the principles of science must be as fallible as their human creators. Unfortunately for theology, however, the prestige of science increased in the 16th century and skyrocketed in the 17th and 18th centuries. Modern thinkers preferred to reach their own conclusions by using reason and experience even if ultimately those conclusions did not have the authority of God to support them. As theologians lost confidence in reason, other thinkers, who had little or no commitment to Aristotelian thought, became its champions, thus furthering the development of modern science.

#### 11.2 Faith and reason

Although modern philosophers as a group are usually thought to be purely secular thinkers, in fact nothing could be further from the truth. From the early 17th century until the middle of the 18th century, all the great philosophers incorporated substantial religious elements into their

---

<sup>179</sup> <https://www.britannica.com/topic/philosophy/>

<sup>180</sup> <https://www.britannica.com/biography/gregory-of-rimini/>

work. In his *Meditations* (1641), for example, René Descartes offered two distinct proofs of the existence of God and asserted that no one who does not have a rationally well-founded belief in God can have knowledge in the proper sense of the term.<sup>181</sup> Benedict de Spinoza (1632–77) began his *Ethics* (1677) with a proof of God’s existence and then discussed at length its implications for understanding all reality. And George Berkeley (1685–1753) explained the apparent stability of the sensible world by appealing to God’s constant thought of it.

Among the reasons modern philosophers are mistakenly thought to be primarily secular thinkers is that many of their epistemological principles, including some that were designed to defend religion, were later interpreted as subverting the rationality of religious belief. The views of Thomas Hobbes (1588–1679) might briefly be considered in that connection. In contrast to the standard view of the Middle Ages that propositions of faith are rational, Hobbes argued that such propositions belong not to the intellect but to the will. The significance of religious propositions, in other words, lies not in what they say but in how they are used. To profess a religious proposition is not to assert a factual claim about the world, which may then be supported or refuted with reasons, but merely to give praise and honour to God and to obey the commands of lawful religious authorities. Indeed, one does not even need to understand the meanings of the words in the proposition in order for this function to be fulfilled; simply mouthing them would be sufficient.<sup>182</sup>

In *An Essay Concerning Human Understanding* (1690), John Locke further eroded the intellectual status of religious propositions by making them subordinate to reason in several respects.<sup>183</sup> First, reason can restrict the possible content of propositions allegedly revealed by God; in particular, no proposition of faith can be a contradiction. Furthermore, because no revelation can contain an idea not derived from sense experience, one should not believe St. Paul when he speaks of experiencing things as “eye has not seen, nor ear heard, nor has it entered into the heart of man to conceive.” Another respect in which reason takes precedence over faith is that knowledge based on immediate sense experience (what Locke called “intuitive knowledge”) is always more certain than any alleged revelation. Thus, people who see that someone is dead cannot have it revealed to them that that person is at that moment alive. Rational proofs in mathematics and science also cannot be controverted by divine revelation. The interior angles of a rectangle equal  $360^\circ$ , and no alleged revelation to the contrary is credible. In short, wrote Locke, “Nothing that is contrary to, and inconsistent with, the clear and self-evident dictates of reason, has a right to be urged or assented to as a matter of faith.”<sup>184</sup>

---

<sup>181</sup>A.H. Armsstrong. *An Introduction to Ancient Philosophy*, op.cit.

<sup>182</sup> Ibid.

<sup>183</sup> Ibid.

<sup>184</sup> Ibid.

What space, then, does faith occupy in the mansion of human beliefs? According to Locke, it shares a room with probable truths, which are propositions of which reason cannot be certain.<sup>185</sup> There are two types of probable truth: that which concerns observable matters of fact and that which goes “beyond the discovery of our sense.”<sup>186</sup> Religious propositions can belong to either category, as can empirical and scientific propositions. Thus, the propositions “Caesar crossed the Rubicon” and “Jesus walked on water” belong to the first category, because they make claims about events that would be observable if they occurred. On the other hand, propositions like “Heat is caused by the friction of imperceptibly small bodies” and “Angels exist” belong to the second category, because they concern entities that by definition cannot be objects of sense experience.

Although it might seem that Locke’s mixing of religious and scientific claims helped to secure a place for the former, in fact it did not, for Locke also held that “reason must judge” whether or not something is a revelation and, more generally, that “*reason must be our last judge and guide in everything.*”<sup>187</sup> Although that maxim was intended to reconcile reason and revelation—indeed, Locke called reason “natural revelation” and revelation “*natural reason enlarged* by a new set of discoveries communicated by God”<sup>188</sup>—over the course of the subsequent 200 years, reason repeatedly judged that alleged revelations had no scientific or intellectual standing.

Despite the strong religious elements in the thought of modern philosophers, especially those writing before the middle of the 18th century, the vast majority of contemporary epistemologists have been interested only in the purely secular aspects of their work. Accordingly, those aspects will predominate in the following discussion.

### 11.3 Epistemology and modern science

The Polish astronomer Nicolaus Copernicus (1473–1543) argued in *On the Revolutions of the Celestial Spheres* (1543) that Earth revolves around the Sun.<sup>189</sup> His theory was epistemologically shocking for at least two reasons. First, it directly contravened the way in which humans experienced their relation to the Sun, and in doing so it made ordinary nonscientific reasoning about the world seem unreliable—indeed, like a kind of superstition. Second, it contradicted the account presented in several books of the Bible, most importantly the story in Genesis of the structure of the cosmos, according to which Earth is at the centre of

---

<sup>185</sup> Ibid.

<sup>186</sup> Ibid.

<sup>187</sup> <https://www.britannica.com/biography/john-locke/>

<sup>188</sup> Ibid.

<sup>189</sup> Nicolaus Copernicus, *On the Revolution of the Celestial Spheres* (1943), <https://www.environmentandsociety.org>.

creation.<sup>190</sup>If Copernicus were right, then the Bible could no longer be treated as a reliable source of scientific knowledge.

Many of the discoveries of the Italian astronomer Galileo Galilei (1564–1642) were equally unsettling.<sup>191</sup> His telescope seemed to reveal that unaided human vision gives false, or at least seriously incomplete, information about the nature of celestial bodies. In addition, his mathematical descriptions of physical phenomena indicated that much of sense experience of these phenomena contributes nothing to knowledge of them.

Another counterintuitive theory of Galileo was his distinction between the “primary” and the “secondary” qualities of an object. Whereas primary qualities—such as figure, quantity, and motion—are genuine properties of things and are knowable by mathematics, secondary qualities—such as colour, odour, taste, and sound—exist only in human consciousness and are not part of the objects to which they are normally attributed.<sup>192</sup>

#### 11.4 René Descartes

Both the rise of modern science and the rediscovery of skepticism were important influences on René Descartes. Although he believed that certain knowledge was possible and that modern science would one day enable humans to become the masters of nature, he also thought that skepticism presented a legitimate challenge that needed an answer, one that only he could provide.

The challenge of skepticism, as Descartes saw it, is vividly described in his *Meditations* (1641). He considered the possibility that an “evil genius” with extraordinary powers has deceived him to such an extent that all his beliefs are false. But it is not possible, Descartes contended, that all his beliefs are false, for if he has false beliefs, he is thinking, and if he is thinking, then he exists. Therefore, his belief that he exists cannot be false, as long as he is thinking. This line of argument is summarized in the formula *cogito, ergo sum* (“I think, therefore I am”).<sup>193</sup>

Descartes distinguished two sources of knowledge: intuition and deduction.<sup>194</sup> Intuition is an unmediated mental “seeing,” or direct apprehension. Descartes’s intuition of his own thinking guarantees that his belief that he is thinking is true. Although his formula might suggest that his belief that he exists is guaranteed by deduction rather than intuition (because it contains the term *therefore*), in the *Objections and Replies* (1642) he stated explicitly that the certainty of this belief also is based upon intuition.

---

<sup>190</sup>B.P. Beckwith, *Religion, Philosophy and Science: An Introduction to Logical Positivism* (New York: Philosophical library, 1957).

<sup>191</sup><https://www.britannica.com/biography/john-locke/galileo-galilei/>

<sup>192</sup> Ibid.

<sup>193</sup><https://www.britannica.com/biography/ree-descartes/>

<sup>194</sup> Ibid.

If one could know only that one thinks and that one exists, human knowledge would be depressingly meager. Accordingly, Descartes attempted to broaden the limits of knowledge by proving to his own satisfaction that God exists, that the standard for knowing something is having a “clear and distinct” idea of it. That mind is more easily known than body, that the essence of matter is extension, and, finally, that most of his former beliefs are true.

Unfortunately for Descartes, few people were convinced by these arguments. One major problem with them has come to be known as the “Cartesian circle.”<sup>195</sup> Descartes’s argument to show that his knowledge extends beyond his own existence depends upon the claim that whatever he perceives “clearly and distinctly” is true. That claim in turn is supported by his proof of the existence of God, together with the assertion that God, because he is not a deceiver, would not cause Descartes to be deceived in what he clearly and distinctly perceives. But because the criterion of clear and distinct perception presupposes the existence of God, Descartes cannot rely upon it in order to guarantee that he has not been deceived (i.e., that he did not make a mistake) in the course of proving that God exists. Therefore, he does not know that his proof is cogent. But if he does not know that, then he cannot use the criterion of clear and distinct perception to show that he knows more than that he exists.

## 11.5 John Locke

Whereas rationalist philosophers such as Descartes held that the ultimate source of human knowledge is reason, empiricists such as John Locke argued that the source is experience (*see* Rationalism and empiricism).<sup>196</sup> Rationalist accounts of knowledge also typically involved the claim that at least some kinds of ideas are “innate,” or present in the mind at (or even before) birth. For philosophers such as Descartes and Gottfried Wilhelm Leibniz (1646–1716), the hypothesis of innateness is required in order to explain how humans come to have ideas of certain kinds.<sup>197</sup> Such ideas include not only mathematical concepts such as numbers, which appear not to be derived from sense experience, but also, according to some thinkers, certain general metaphysical principles, such as “every event has a cause.”

Locke claimed that that line of argument has no force. He held that all ideas (except those that are “trifling”) can be explained in terms of experience.<sup>198</sup> Instead of attacking the doctrine of innate ideas directly, however, his strategy was to refute it by showing that it is explanatorily otiose and hence dispensable.

---

<sup>195</sup><https://www.britannica.com/topic/cartesian-circle/>

<sup>196</sup><https://www.britannica.com/topic/epistemology/>

<sup>197</sup> H.C. Ezebuilo, Descartes, Leibniz and Spinoza: A Brief Survey of Rationalism, *AMAMIHE: Journal of Applied Philosophy*, 18(6), (2020), 106-110.

<sup>198</sup> H.C. Ezebuilo, Locke, Berkeley and Hume: A Brief Survey of Empiricism, *International Journal of Research in Education, Humanities and Commerce*, 1(2), (2020), 88.

There are two kinds of experience, according to Locke: observation of external objects—i.e., sensation—and observation of the internal operations of the mind.<sup>199</sup> Locke called the latter kind of experience, for which there is no natural word in English, “reflection.” Some examples of reflection are perceiving, thinking, doubting, believing, reasoning, knowing, and willing.

As Locke used the term, a “simple idea” is anything that is an “immediate object of perception” (i.e., an object as it is perceived by the mind) or anything that the mind “perceives *in itself*” through reflection.<sup>200</sup> Simple ideas, whether they are ideas of perception or ideas of reflection, may be combined or repeated to produce “compound ideas,” as when the compound idea of an apple is produced by bringing together simple ideas of a certain colour, texture, odour, and figure. Abstract ideas are created when “ideas taken from particular beings become general representatives of all of the same kind.”

The “qualities” of an object are its powers to cause ideas in the mind. One consequence of that usage is that, in Locke’s epistemology, words designating the sensible properties of objects are systematically ambiguous. The word *red*, for example, can mean either the idea of red in the mind or the quality in an object that causes that idea. Locke distinguished between primary and secondary qualities, as Galileo did. According to Locke, primary qualities, but not secondary qualities, are represented in the mind as they exist in the object itself.<sup>201</sup> The primary qualities of an object, in other words, resemble the ideas they cause in the mind. Examples of primary qualities include “solidity, extension, figure, motion, or rest, and number.” Secondary qualities are configurations or arrangements of primary qualities that cause sensible ideas such as sounds, colours, odours, and tastes.<sup>202</sup> Thus, according to Locke’s view, the phenomenal redness of a fire engine is not in the fire engine itself, but its phenomenal solidity is. Similarly, the phenomenal sweet odour of a rose is not in the rose itself, but its phenomenal extension is.

In Book IV of *An Essay Concerning Human Understanding* (1689), Locke defined knowledge as “the perception of the connexion of and agreement, or disagreement and repugnancy of any of our ideas.”<sup>203</sup> Knowledge so defined admits of three degrees, according to Locke.<sup>204</sup> The first is what he called “intuitive knowledge,” in which the mind “perceives the agreement or disagreement of two ideas immediately by themselves, without the intervention of any other.” Although Locke’s first examples of intuitive knowledge are analytic propositions such as “white is not black,” “a circle is not a triangle,” and “three are more than two,” later he said that “the knowledge of our own being we have by intuition.” Relying on the metaphor of light as Augustine and others had, Locke said of this knowledge that “the mind is presently filled with

---

<sup>199</sup><https://www.britannica.com/biography/john-locke/>

<sup>200</sup> H.C. Ezebuilo, Locke, Berkeley and Hume, 87-91.

<sup>201</sup> *Ibid.*

<sup>202</sup> *Ibid.*

<sup>203</sup><https://www.britannica.com/topic/essay-concerning-human-understanding/>

<sup>204</sup> *Ibid.*

the clear light of it. It is on this intuition that depends all the certainty and evidence of all our knowledge.”

The second degree of knowledge obtains when “the mind perceives the agreement or disagreement of...ideas, but not immediately.” In these cases, some mediating idea makes it possible to see the connection between two other ideas. In a demonstration (or proof), for example, the connection between any premise and the conclusion is mediated by other premises and by the laws of logic. Demonstrative knowledge, although certain, is not as certain as intuitive knowledge, according to Locke, because it requires effort and attention to go through the steps needed to recognize the certainty of the conclusion.

A third degree of knowledge, “sensitive knowledge,” is roughly the same as what Duns Scotus called “intuitive cognition”—namely, the perception of “the particular existence of finite beings without us.” Unlike intuitive cognition, however, Locke’s sensitive knowledge is not the most certain kind of knowledge it is possible to have. For him, it is less certain than intuitive or demonstrative knowledge.

Next in certainty to knowledge is probability,<sup>205</sup> which Locke defined as the appearance of agreement or disagreement of ideas with each other. Like knowledge, probability admits of degrees, the highest of which attaches to propositions endorsed by the general consent of all people in all ages. Locke may have had in mind the virtually general consent of his contemporaries in the proposition that God exists, but he also explicitly mentioned beliefs about causal relations.

The next highest degree of probability belongs to propositions that hold not universally but for the most part, such as “people prefer their own private advantage to the public good.”<sup>206</sup> This sort of proposition is typically derived from history. A still lower degree of probability attaches to claims about specific facts—for example, that a man named Julius Caesar lived a long time ago. Problems arise when testimonies conflict, as they often do, but there is no simple rule or set of rules that determines how one ought to resolve such controversies.

Probability can concern not only objects of possible sense experience, as most of the foregoing examples do, but also things that are outside the sensible realm, such as angels, devils, magnetism, and molecules.

## 11.6 George Berkeley

The next great figure in the development of empiricist epistemology was George Berkeley (1685–1753). In his major work, *A Treatise Concerning the Principles of Human*

---

<sup>205</sup> Ibid.

<sup>206</sup> Ibid.

*Knowledge* (1710), Berkeley asserted that nothing exists except ideas and spirits (minds or souls).<sup>207</sup> He distinguished three kinds of ideas: those that come from sense experience which corresponds to Locke's simple ideas of perception; those that come from "attending to the passions and operations of the mind" which corresponds to Locke's ideas of reflection; and those that come from compounding, dividing, or otherwise representing ideas which corresponds to Locke's compound ideas. By *spirit* Berkeley meant "one simple, undivided, active being." The activity of spirits consists of both understanding and willing: understanding is spirit perceiving ideas, and will is spirit producing ideas.

For Berkeley, ostensibly physical objects like tables and chairs are really nothing more than collections of sensible ideas.<sup>208</sup> Since no idea can exist outside a mind, it follows that tables and chairs, as well all the other furniture of the physical world, exist only insofar as they are in the mind of someone—i.e., only insofar as they are perceived. For any non-thinking being, *esse est percipi* ("to be is to be perceived"). The clichéd question of whether a tree falling in an uninhabited forest makes a sound was inspired by Berkeley's philosophy, though he never considered it in those terms. He did, however, consider the implicit objection and gave various answers to it. He sometimes said that a table in an unperceived room would be perceived if someone were there. That conditional response, however, is inadequate. Granted that the table would exist if it were perceived, does it exist when it is not perceived? Berkeley's more pertinent answer was that even when no human is perceiving a table or other such object, God is, and it is God's thinking that keeps the otherwise unperceived object in existence.<sup>209</sup>

Although that doctrine initially strikes most people as strange, Berkeley claimed that he was merely describing the commonsense view of reality. To say that colours, sounds, trees, dogs, and tables are ideas is not to say that they do not really exist. It is merely to say what they really are. Moreover, to say that animals and pieces of furniture are ideas is not to say that they are diaphanous, gossamer, and evanescent. Opacity, density, and permanence are also ideas that partially constitute those objects.

Berkeley supported his main thesis with a syllogistic argument: physical things—such as trees, dogs, and houses—are things perceived by sense; things perceived by sense are ideas; therefore, physical things are ideas.<sup>210</sup> If one objects that the second premise of the syllogism is false—people sense things, not ideas—Berkeley would reply that there are no sensations without ideas and that it makes no sense to speak of some additional thing that ideas are supposed to represent or resemble. Unlike Locke, Berkeley did not believe that there is anything "behind" or

---

<sup>207</sup><https://www.britannica.com/biography/george-berkeley/>

<sup>208</sup> H.C. Ezebuilo, *Locke, Berkeley and Hume*, 92.

<sup>209</sup> *Ibid.*

<sup>210</sup> *Ibid.*, 94-95.



“underlying” ideas in a world external to the mind. Indeed, Berkeley claimed that no clear idea can be attached to that notion.

One consequence of Berkeley’s view is that Locke’s distinction between primary and secondary qualities is spurious. Extension, figure, motion, rest, and solidity are as much ideas as green, loud, and bitter are; there is nothing special about the former kind of idea. Furthermore, matter, as philosophers conceive it, does not exist. Indeed, it is contradictory, for matter is supposedly unsensed extension, figure, and motion, but since extension, figure, and motion are ideas, they must be sensed.

Berkeley’s doctrine that things unperceived by human beings continue to exist in the thought of God was not novel. It was part of the traditional belief of Christian philosophers from Augustine through Aquinas and at least to Descartes that God not only creates all things but also keeps them in existence by thinking of them. According to that view, if God were ever to stop thinking of a creature, it would immediately be annihilated.

## **11.7 David Hume**

Although Berkeley rejected the Lockean notions of primary and secondary qualities and matter, he retained Locke’s belief in the existence of mind, substance, and causation as an unseen force or power in objects. David Hume, in contrast, rejected all these notions.

### **11.7.1 Kinds of Perception**

Hume recognized two kinds of perception: “impressions” and “ideas.”<sup>211</sup> Impressions are perceptions that the mind experiences with the “most force and violence,” and ideas are the “faint images” of impressions. Hume considered this distinction so obvious that he demurred from explaining it at any length; as he indicated in a summary explication in *A Treatise of Human Nature* (1739–40), impressions are felt, and ideas are thought. Nevertheless, he conceded that sometimes sleep, fever, or madness can produce ideas that approximate to the force of impressions, and some impressions can approach the weakness of ideas. But such occasions are rare.

The distinction between impressions and ideas is problematic in a way that Hume did not notice. The impression (experience) of anger, for example, has an unmistakable quality and intensity. But the idea of anger is not the same as a “weaker” experience of anger. Thinking of anger no more guarantees being angry than thinking of happiness guarantees being happy. So there seems to be a difference between the impression of anger and the idea of anger that Hume’s theory does not capture.

---

<sup>211</sup> H.C. Ezebuilo, Locke, Berkeley and Hume, 96.

All perceptions, whether impressions or ideas, can be either simple or complex.<sup>212</sup> Whereas simple perceptions are not subject to further separation or distinction, complex perceptions are. To return to an example mentioned above, the perception of an apple is complex, insofar as it consists of a combination of simple perceptions of a certain shape, colour, texture, and aroma. It is noteworthy that, according to Hume, for every simple impression there is a simple idea that corresponds to it and differs from it only in force and vivacity, and vice versa. Thus, corresponding to the impression of red is the idea of red. This correlation does not hold true in general for complex perceptions. Although there is a correspondence between the complex impression of an apple and the complex idea of an apple, there is no impression that corresponds to the idea of Pegasus or to the idea of a unicorn; these complex ideas do not have a correlate in reality. Similarly, there is no complex idea corresponding to the complex impression of, say, an extensive vista of the city of Rome.

Because the formation of every simple idea is always preceded by the experience of a corresponding simple impression, and because the experience of every simple impression is always followed by the formation of a corresponding simple idea, it follows, according to Hume, that simple impressions are the causes of their corresponding simple ideas.<sup>213</sup>

There are two kinds of impressions: those of sensation and those of reflection. Regarding the former, Hume was of the opinion that sensation “arises in the soul originally from unknown causes.” Impressions of reflection arise from a complicated series of mental operations. First, one experiences impressions of heat or cold, thirst or hunger, pleasure or pain; second, one forms corresponding ideas of heat or cold, thirst or hunger, pleasure or pain; and third, one’s reflection on these ideas produces impressions of “desire and aversion, hope and fear.”

Because the faculty of imagination can divide and assemble disparate ideas at will, some explanation is needed for the fact that people tend to think in regular and predictable patterns. Hume said that the production of thoughts in the mind is guided by three principles:<sup>214</sup> resemblance, contiguity, and cause and effect. Thus, people who think of one idea are likely to think of another idea that resembles it; their thought is likely to run from red to pink to white or from dog to wolf to coyote. Concerning contiguity, people are inclined to think of things that are next to each other in space and time. Finally, and most importantly, people tend to create associations between ideas of things that are causally related. The ideas of fire and smoke, parent and child, and disease and death are connected in the mind for that reason.

---

<sup>212</sup><https://www.britannica.com/biography/david-hume/>

<sup>213</sup> Ibid.

<sup>214</sup> Ibid.

Hume used the principle of resemblance for another purpose: to explain the nature of general ideas. He held that there are no abstract ideas, and he affirmed that all ideas are particular. Some of them, however, function as general ideas—i.e., ideas that represent many objects of a certain kind—because they incline the mind to think of other ideas that they resemble.

### 11.7.2 Relations of ideas and matters of fact

According to Hume, the mind is capable of apprehending two kinds of proposition or truth: those expressing “relations of ideas” and those expressing “matters of fact.”<sup>215</sup> The former can be intuited—i.e., seen directly—or deduced from other propositions. That  $a$  is identical with  $a$ , that  $b$  resembles  $c$ , and that  $d$  is larger than  $e$  are examples of propositions that are intuited. The negations of true propositions expressing relations of ideas are contradictory. Because the propositions of arithmetic and algebra are exclusively about relations of ideas, according to Hume, those disciplines are more certain than others. In the *Treatise*, Hume said that geometry is not quite as certain as arithmetic and algebra, because its original principles derive from sensation, and about sensation there can never be absolute certainty. He revised his views later, however, and, in *An Enquiry Concerning Human Understanding* (1748), he put geometry on an equal footing with the other mathematical sciences.<sup>216</sup>

Unlike propositions about relations of ideas, propositions about matters of fact are known only through experience. By far the most important of such propositions are those that express or presuppose causal relations—e.g., “Fire causes heat” and “A moving billiard ball communicates its motion to any stationary ball it strikes.” But how is it possible to know through experience that one kind of object or event causes another? What kind of experience would justify such a claim?

### 11.7.3 Cause and effect

Hume observed that the idea of causation contains three components: contiguity (i.e., near proximity) of time and place, temporal priority of the cause, and a more mysterious component, which he called “necessary connection.”<sup>217</sup> In other words, when one says that  $x$  is a cause of  $y$ , one means that instances of  $x$  and instances of  $y$  are always near each other in time and space, that instances of  $x$  occur before instances of  $y$ , and that there is some connection between  $x$ 's and  $y$ 's that makes it necessary that an instance of  $y$  occurs if an instance of  $x$  does.

---

<sup>215</sup><https://www.britannica.com/topic/relation-logic-and-mathematics/>

<sup>216</sup> D. Hume, *Enquiry Concerning Human Understanding and Concerning the Principles of Morals* (Oxford: Clarendon Press, 1975).

<sup>217</sup> H.C. Ezebuilo, Locke, Berkeley and Hume, 99.

It is easy to explain the origin in experience of the first two components of the idea of causation. In past experience, all events consisting of a moving billiard ball striking a stationary one were quickly followed by events consisting of the movement of the formerly stationary ball. In addition, the first sort of event always preceded the second and never the reverse. But whence the third component of the idea of causation, whereby one thinks that the striking of the stationary ball somehow necessitates that it will move? That necessity has never been seen or otherwise directly observed in past experience, as have the contiguity and temporal order of the striking and moving of billiard balls.

It is important to note that were it not for the idea of necessary connection, there would be no reason to believe that a currently observed cause will produce an unseen effect in the future or that a currently observed effect was produced by an unseen cause in the past, for the mere fact that past instances of the cause and the effect were contiguous and temporally ordered in a certain way does not logically imply that present and future instances will display the same relations. Such an inference could be justified only if one assumed a principle such as “instances, of which we have had no experience, must resemble those, of which we have had experience, and that the course of nature continues always uniformly the same.” The problem with that principle is that it stands in need of justification, and the only possible justification is question-begging. That is, one could argue that present and future experience will resemble past experience, because in the past, present and future experience resembled past experience. But that argument clearly assumes what it sets out to prove.

Hume offered a “skeptical solution” of the problem of the origin of the idea of necessary connection. According to him, it arises from the feeling of “determination” that is created in the mind when it experiences the first member of a pair of events that it is long accustomed to experiencing together.<sup>218</sup> When the mind observes the moving billiard ball striking the stationary one, it is moved by force of habit and custom to form an idea of the movement of the stationary ball—i.e., to believe that the stationary ball will move. The feeling of being “carried along” in this process is the impression from which the idea of necessary connection is derived.

Hume’s solution is “skeptical” in the sense that, though it accounts for the origins of the idea of necessary connection, it does not make the causal inferences any more rational than they were before. The solution explains why we are psychologically compelled to form beliefs about future effects and past causes, but it does not justify those beliefs logically. It remains true that our only evidence for these beliefs is our past experience of contiguity and temporal precedence. “All inferences from experience, therefore, are effects of custom, not of reasoning.” Thus it is that custom, not reason, is the great guide of life.

---

<sup>218</sup> Ibid.

#### 11.7.4 Substance

From the time of Plato, one of the most basic notions in philosophy has been “substance”—that whose existence does not depend upon anything else. For Locke, the substance of an object is the hidden “substratum” in which the object’s properties inhere and on which they depend for their existence. One of the reasons for Hume’s importance in the history of philosophy is that he rejected that notion. In keeping with his strict empiricism, he held that the idea of substance, if it answers to anything genuine, must arise from experience.<sup>219</sup> But what kind of experience can that be? By its proponents’ own definition, substance is that which underlies an object’s properties, including its sensible properties; it is therefore in principle unobservable. Hume concluded, “We have therefore no idea of substance, distinct from that of a collection of particular qualities, nor have we any other meaning when we either talk or reason concerning it.”<sup>220</sup>

Furthermore, the things that earlier philosophers had assumed were substances are in fact “nothing but a collection of simple ideas, that are united by the imagination, and have a particular name assigned to them.” Gold, to take Hume’s example, is nothing but the collection of the ideas of yellow, malleable, fusible, and so on. Even the mind, or the “self,” is only a “heap or collection of different perceptions united together by certain relations and supposed, though falsely, to be endowed with a perfect simplicity or identity.”<sup>221</sup> That conclusion had important consequences for the problem of personal identity, to which Locke had devoted considerable attention, for if there is nothing to the mind but a collection of perceptions, then there is no self that perdures as the subject of those perceptions. Therefore, it does not make sense to speak of the subject of certain perceptions yesterday as the same self, or the same person, as the subject of certain perceptions today or in the future. There is no self or person there.

#### 11.8 Immanuel Kant

Idealism is often defined as the view that everything that exists is mental. In other words, everything is either a mind or dependent for its existence on a mind. Immanuel Kant was not strictly an idealist according to that definition. His doctrine of “transcendental idealism” held that all theoretical (i.e., scientific) knowledge is a mixture of what is given in sense experience and what is contributed by the mind. The contributions of the mind are necessary conditions for having any sense experience at all. They include the spatial and temporal “forms” in which physical objects appear, as well as various extremely general features that together give the experience an intelligible structure. Those features are imposed when the mind, in the act of forming a judgment about experience, brings the content of experience under one of the “pure

---

<sup>219</sup><https://www.britannica.com/topic/substance-philosophy/>

<sup>220</sup> Ibid.

<sup>221</sup> Ibid.

concepts of the understanding.<sup>222</sup> Those concepts are unity, plurality, and totality; reality, negation, and limitation; inherence and subsistence, causality and dependence, and community (or reciprocity); and possibility, existence, and necessity. Among the more noteworthy of the mind's contributions to experience is causality, which Hume asserted has no real existence.

His idealism notwithstanding, Kant also believed that there exists a world independent of the mind and completely unknowable by it.<sup>223</sup> That world consists of "things-in-themselves" (noumena), which do not exist in space and time and do not enter into causal relations. Because of his commitment to realism (minimal though it may have been), Kant was disturbed by Berkeley's uncompromising idealism, which amounted to a denial of the existence of the external world. Kant found that doctrine incredible and rejected "the absurd conclusion that there can be appearance without anything that appears."<sup>224</sup>

Because Kant's theory attributes to the mind many aspects of reality that earlier theories assumed are given in or derived from experience, it can be thought of as inverting the traditional relation in epistemology between the mind and the world. According to Kant, knowledge results not when the mind accommodates itself to the world but rather when the world conforms to the requirements of human sensibility and rationality. Kant compared his reorientation of epistemology to the Copernican revolution in astronomy, which placed the Sun rather than Earth at the centre of the universe.

According to Kant, the propositions that express human knowledge can be divided into three kinds:<sup>225</sup> (1) analytic a priori propositions, such as "All bachelors are unmarried" and "All squares have four sides," (2) synthetic a posteriori propositions, such as "The cat is on the mat" and "It is raining," and (3) what he called "synthetic a priori" propositions, such as "Every event has a cause." Although in the last kind of proposition the meaning of the predicate term is not contained in the meaning of the subject term, it is nevertheless possible to know the proposition independently of experience, because it expresses a condition imposed by the forms of sensibility. Nothing can be an object of experience unless it is experienced as having causes and effects. Kant stated that the main purpose of his doctrine of transcendental idealism was to show how such synthetic a priori propositions are possible.

Since human beings can experience the world only as a system that is bounded by space and time and completely determined by causal laws, it follows that they can have no theoretical (i.e., scientific) knowledge of anything that is inconsistent with such a realm or that by definition

---

<sup>222</sup> I. Kant, *Critique of Pure Reason* (New York: Anchor Books, 1966).

<sup>223</sup> Ibid.

<sup>224</sup> Ibid.

<sup>225</sup> Ibid.

exists independently of it—including God, human freedom, and the immortality of the soul. Nevertheless, belief in those ideas is justified, according to Kant, because each is a necessary condition of our conceiving of ourselves as moral agents.

### 11.8.1 A Summary of Kant's Epistemology

Immanuel Kant (1724-1804) sought to bridge, to synthesize, the rationalist and empiricist traditions in epistemology. He did so in response to the skepticism of David Hume, whom he said had “awakened him from his dogmatic slumbers.” Kant agreed with the empiricists that concepts without perceptions are empty. Concepts/ideas alone cannot constitute knowledge. Innate ideas do not constitute knowledge. There must be experience(s) for there to be knowledge. However, Kant also agreed with the rationalists that perceptions without concepts are blind. Merely having experiences/perceptions also does not constitute knowledge. There must be some way in which the mind organizes/structures experience for there to be knowledge.

Kant also held that it is true that all knowledge begins with experience. Without experience no knowledge takes place. Experience is the initiator of the process of attaining knowledge. Here he once again agrees with the empiricist affirmation of the necessity of experience in knowing. However, Kant also held that, it is not true that all knowledge arises from experience. Experience is not the sole source of knowledge. There must be “categories” by which experience is structured/understood for there to be knowledge. Here he agrees with the rationalists.

Kant affirmed that the mind is active in the knowing process. The mind makes an active contribution to “the-world-as-it-is-known.” The world-as-it-is-known” (what Kant would call the phenomenal realm) conforms to the mind in the knowledge process, rather than the mind conforming to a world that has its own mind-independent structure/organization. Thus, knowledge has a profoundly subjective dimension (i.e. the mind) as well as an objective dimension (i.e. the world-as-it-is-in-itself; what Kant would call the noumenal realm).

The mind contains “categories of understanding.” These categories are the ways in which the active mind forms or structures experience. For Kant, there were twelve of such categories, one of which was the category of causation/cause-and-effect. The active mind relates and understands experiences in terms of some event-experiences being causes, with other event-experiences being their effects.

Furthermore, Kant affirmed *synthetic a-priori truths*. These are truths that are universal and necessary, as *a-priori* truths are truths that are universal and necessary. Unlike universal and necessary truths that are analytically true (i.e. true in accordance with the meaning of concepts, but telling us nothing about the way the world is), Kant affirmed that some universal and necessary truths are synthetic – they tell us about the way the known world is. They are constitutive of the-world-as-it-is-known.

Meanwhile, the basis of scientific knowledge is the fact that “every event has a cause.” Hume demonstrated that we cannot claim to know/justify this on the basis of empiricist assumptions.

He held that “cause” is not a thing/fact out there in the world. Thus we can have no idea or knowledge of causal connections in reality.<sup>226</sup> Causal attributions are merely a kind of mental habit. Now, Kant held that the statement “every event has a cause” is a universally and necessarily true statement – something that we do know. It is not a mere mental habit. But the truth of the statement is grounded in the ‘cause-category’ within the mind that actively structures, universally and necessarily, all our experience of the world. Kant assumed that every human being, as a rational being, possesses and utilizes the same categories of understanding. As reason is the same in all rational beings, so in principle the proper exercise of reason will lead any and all persons to knowledge claims that are objectively and universally valid.

It follows that we do not know reality as it might be “in itself” – apart from how our minds structure experience of “mind-independent reality.” We do not know *noumena*. We only know reality in terms of how our active minds structure/organize/form our experiences of mind-independent reality. We only know *phenomena*.

### 11.9 G.W.F. Hegel

The positive views of the German idealist philosopher Georg Wilhelm Friedrich Hegel (1770–1831) are notoriously difficult, and his epistemology is not susceptible of adequate summary within the scope of this book. Some of his criticisms of earlier epistemological views should be mentioned, however, since they helped to bring the modern era in philosophy to a close.

In his *Phenomenology of Spirit* (1807),<sup>227</sup> Hegel criticized traditional empiricist epistemology for assuming that at least some of the sensory content of experience is simply “given” to the mind and apprehended directly as it is, without the mediation of concepts. According to Hegel, there is no such thing as direct apprehension, or unmediated knowledge. Although Kant also held that empirical knowledge necessarily involves concepts (as well as the mentally contributed forms of space and time), he nevertheless attributed too large a role to the given, according to Hegel.

Another mistake of earlier epistemological theories—both empiricist and rationalist—is the assumption that knowledge entails a kind of “correspondence” between belief and reality. The search for such a correspondence is logically absurd, Hegel argued, since every such search must end with some belief about whether the correspondence holds, in which case one has not advanced beyond belief.<sup>228</sup> In other words, it is impossible to compare beliefs with reality, because the experience of reality is always mediated by beliefs. One cannot step outside belief altogether. For Hegel, the Kantian distinction between the phenomena of experience and the unknowable thing-in-itself is an instance of that absurdity.

---

<sup>226</sup> H.C. Ezebuilo, “Locke, Berkeley and Hume: A Brief Survey of Empiricism,” *International Journal of Research in Education, Humanities and Commerce* 1(2), (2020).

<sup>227</sup><https://www.britannica.com/biography/george-wilhelm-friedrich-hegel/>

<sup>228</sup> Ibid.