

CHAPTER FOURTEEN

EMPIRICISM

14.1 What is Empiricism?

Empiricism is the view that all concepts originate in experience, that all concepts are about or applicable to things that can be experienced, or that all rationally acceptable beliefs or propositions are justifiable or knowable only through experience. This broad definition accords with the derivation of the term *empiricism* from the ancient Greek word *empeiria*, “experience.”

Concepts are said to be “a posteriori” (Latin: “from the latter”) if they can be applied only on the basis of experience, and they are called “a priori” (“from the former”) if they can be applied independently of experience. Beliefs or propositions are said to be a posteriori if they are knowable only on the basis of experience and a priori if they are knowable independently of experience. Thus, according to the second and third definitions of empiricism above, empiricism is the view that all concepts, or all rationally acceptable beliefs or propositions, are a posteriori rather than a priori.

The first two definitions of empiricism typically involve an implicit theory of meaning, according to which words are meaningful only insofar as they convey concepts. Some empiricists have held that all concepts are either mental “copies” of items that are directly experienced or complex combinations of concepts that are themselves copies of items that are directly experienced. This view is closely linked to the notion that the conditions of application of a concept must always be specified in experiential terms.

The third definition of empiricism is a theory of knowledge, or theory of justification. It views beliefs, or at least some vital classes of belief—e.g., the belief that this object is red—as depending ultimately and necessarily on experience for their justification. An equivalent way of stating this thesis is to say that all human knowledge is derived from experience.

Empiricism regarding concepts and empiricism regarding knowledge do not strictly imply each other. Many empiricists have admitted that there are a priori propositions but have denied that there are a priori concepts. It is rare, however, to find a philosopher who accepts a priori concepts but denies a priori propositions.

Stressing experience, empiricism often opposes the claims of authority, intuition, imaginative conjecture, and abstract, theoretical, or systematic reasoning as sources of reliable belief. Its most fundamental antithesis is with the latter—i.e., with rationalism, also called intellectualism or apriorism. A rationalist theory of concepts asserts that some concepts are a priori and that these concepts are innate, or part of the original structure or constitution of the mind. A rationalist theory of knowledge, on the other hand, holds that some rationally acceptable

propositions—perhaps including “everything must have a sufficient reason for its existence” (the principle of sufficient reason)—are a priori. A priori propositions, according to rationalists, can arise from intellectual intuition, from the direct apprehension of self-evident truths, or from purely deductive reasoning.

Empiricism is a view in the theory of knowledge which focuses on the role of experience, especially experience based on perceptual observations by the senses, in the generation of knowledge. Certain forms exempt disciplines such as mathematics and logic from these requirements.

There are many variants of empiricism, including British empiricism, logical empiricism, phenomenism, and some versions of common sense philosophy. Most forms of empiricism give epistemologically privileged status to sensory impressions or sense data, although this plays out very differently in different cases. Some of the most famous historical empiricists include John Locke, David Hume, George Berkeley, Francis Bacon, John Stuart Mill, Rudolf Carnap, and Bertrand Russell.

In philosophy, empiricism is a theory that states that knowledge comes only or primarily from sensory experience.²⁹⁷ Empiricism emphasizes the role of empirical evidence in the formation of ideas, rather than innate ideas or traditions.²⁹⁸ However, empiricists may argue that traditions (or customs) arise due to relations of previous sense experiences.²⁹⁹ Historically, empiricism was associated with the “blank slate” concept (*tabula rasa*), according to which the human mind is blank at birth and develops its thoughts only through experience.

Empiricism in the philosophy of science emphasizes evidence, especially as discovered in experiments. It is a fundamental part of the scientific method that all hypotheses and theories must be tested against observations of the natural world rather than resting solely on *a priori* reasoning, intuition, or revelation. Empiricism, often used by natural scientists, says that knowledge is based on experience and that knowledge is tentative and probabilistic, subject to continued revision and falsification.³⁰⁰ Empirical research, including experiments and validated measurement tools, guides the scientific method.

²⁹⁷ H.C. Ezebuilo, “Locke, Berkeley and Hume: A Brief Survey of Empiricism,” *International Journal of Research in Education, Humanities and Commerce* 1(2), (2020), 84.

²⁹⁸ Ibid.

²⁹⁹ Ibid.

³⁰⁰ Cf. H.C. Ezebuilo and I.N. Okechukwu, “A Hermeneutic Consideration of Karl Popper’s Falsification Theory,” *Nnamdi Azikiwe Journal of Philosophy*, 12(2), (2021).

14.2 Various Meanings of Empiricism

14.2.1 Broader Senses

In both everyday attitudes and philosophical theories, the experiences referred to by empiricists are principally those arising from the stimulation of the sense organs—i.e., from visual, auditory, tactile, olfactory, and gustatory sensation. (In addition to these five kinds of sensation, some empiricists also recognize kinesthetic sensation, or the sensation of movement.) Most philosophical empiricists, however, have maintained that sensation is not the only provider of experience, admitting as empirical the awareness of mental states in introspection or reflection (such as the awareness that one is in pain or that one is frightened); such mental states are then often described metaphorically as being present to an “inner sense.” It is a controversial question whether still further types of experience, such as moral, aesthetic, or religious experience, ought to be acknowledged as empirical. A crucial consideration is that, as the scope of “experience” is broadened, it becomes increasingly difficult to distinguish a domain of genuinely a priori propositions. If, for example, one were to take the mathematician’s intuition of relationships between numbers as a kind of experience, one would be hard-pressed to identify any kind of knowledge that is not ultimately empirical.

Even when empiricists agree on what should count as experience, however, they may still disagree fundamentally about how experience itself should be understood. Some empiricists, for example, conceive of sensation in such a way that what one is aware of in sensation is always a mind-dependent entity (sometimes referred to as a “sense datum”). Others embrace some version of “direct realism,” according to which one can directly perceive or be aware of physical objects or physical properties. Thus there may be radical theoretical differences even among empiricists who are committed to the notion that all concepts are constructed out of elements given in sensation.

Two other viewpoints related to but not the same as empiricism are the pragmatism of the American philosopher and psychologist William James, an aspect of which was what he called radical empiricism, and logical positivism, sometimes also called logical empiricism. Although these philosophies are empirical in some sense, each has a distinctive focus that warrants its treatment as a separate movement. Pragmatism stresses the involvement of ideas in practical experience and action, whereas logical positivism is more concerned with the justification of scientific knowledge.

When describing an everyday attitude, the word *empiricism* sometimes conveys an unfavourable implication of ignorance of or indifference to relevant theory. Thus, to call a doctor an “Empiric” has been to call him a quack—a usage traceable to a sect of medical men who were opposed to the elaborate medical—and in some views metaphysical—theories inherited from the

Greek physician Galen of Pergamum (129–c. 216 CE). The medical empiricists opposed to Galen preferred to rely on treatments of observed clinical effectiveness, without inquiring into the mechanisms sought by therapeutic theory. But *empiricism*, detached from this medical association, may also be used, more favourably, to describe a hard-headed refusal to be swayed by anything but the facts that the thinker has observed for himself, a blunt resistance to received opinion or precarious chains of abstract reasoning.

14.2.2 Stricter Senses

As a more strictly defined movement, empiricism reflects certain fundamental distinctions and occurs in varying degrees. Empiricism, whether concerned with concepts or knowledge, can be held with varying degrees of strength. On this basis, absolute, substantive, and partial empiricisms can be distinguished.

12.2.2.1 Absolute Empiricism

Absolute empiricists hold that there are no a priori concepts, either formal or categorial, and no a priori beliefs or propositions. Absolute empiricism about the former is more common than that about the latter, however. Although nearly all Western philosophers admit that obvious tautologies (e.g., “all red things are red”) and definitional truisms (e.g., “all triangles have three sides”) are a priori, many of them would add that these represent a degenerate case.

12.2.2.2 Substantive Empiricism

A more moderate form of empiricism is that of the substantive empiricists, who are unconvinced by attempts that have been made to interpret formal concepts empirically and who therefore concede that formal concepts are a priori, though they deny that status to categorial concepts and to the theoretical concepts of physics, which they hold are a posteriori. According to this view, allegedly a priori categorial and theoretical concepts are either defective, reducible to empirical concepts, or merely useful “fictions” for the prediction and organization of experience.

The parallel point of view about knowledge assumes that the truth of logical and mathematical propositions is determined, as is that of definitional truisms, by the relationships between meanings that are established prior to experience. The truth often espoused by ethicists, for example, that one is truly obliged to rescue a person from drowning only if it is possible to do so, is a matter of meanings and not of facts about the world. On this view, all propositions that, in contrast to the foregoing example, are in any way substantially informative about the world are a posteriori. Even if there are a priori propositions, they are formal or verbal or conceptual in nature, and their necessary truth derives simply from the meanings that attached to the words they contain. A priori knowledge is useful because it makes explicit the hidden implications of

substantive, factual assertions. But a priori propositions do not themselves express genuinely new knowledge about the world; they are factually empty. Thus “All bachelors are unmarried” merely gives explicit recognition to the commitment to describe as unmarried anyone who has been described as a bachelor.

Substantive empiricism about knowledge regards all a priori propositions as being more-or-less concealed tautologies. If a person’s “duty” is thus defined as that which he should always do, the statement “A person should always do his duty” then becomes “A person should always do what he should always do.” Deductive reasoning is conceived accordingly as a way of bringing this concealed tautological status to light. That such extrication is nearly always required means that a priori knowledge is far from trivial.

For the substantive empiricist, truisms and the propositions of logic and mathematics exhaust the domain of the a priori. Science, on the other hand—from the fundamental assumptions about the structure of the universe to the singular items of evidence used to confirm its theories—is regarded as a posteriori throughout. The propositions of ethics and those of metaphysics, which deals with the ultimate nature and constitution of reality (e.g., “only that which is not subject to change is real”), are either disguised tautologies or “pseudo-propositions,” that is, combinations of words that, despite their grammatical respectability, cannot be taken as true or false assertions at all.

14.2.2.3 Partial Empiricism

The least thoroughgoing type of empiricism here distinguished, ranking third in degree, can be termed partial empiricism. According to this view, the realm of the a priori includes some concepts that are not formal and some propositions that are substantially informative about the world. The theses of the transcendental idealism of Immanuel Kant (1720–1804), the general scientific conservation laws, the basic principles of morality and theology, and the causal laws of nature have all been held by partial empiricists to be both “synthetic” (substantially informative) and a priori. As noted above, philosophers who embrace the Kripkean notion of reference fixing would add to this class propositions such as “heat is the cause of sensations of warmth” and “Aristotle was the teacher of Alexander the Great,” both of which derive their presumed aprioricity from the hypothetical circumstances in which their subject terms were introduced. At any rate, in all versions of partial empiricism there remain a great many straightforwardly a posteriori concepts and propositions: ordinary singular propositions about matters of fact and the concepts that figure in them are held to fall in this domain.

14.3 Historical Background to Empiricism

The English term *empirical* derives from the Ancient Greek word ἐμπειρία, *empeiria*, which is cognate with and translates to the Latin *experientia*, from which the

words *experience* and *experiment* are derived.³⁰¹ A central concept in science and the scientific method is that conclusions must be *empirically* based on the evidence of the senses. Both natural and social sciences use working hypotheses that are testable by observation and experiment. The term *semi-empirical* is sometimes used to describe theoretical methods that make use of basic axioms, established scientific laws, and previous experimental results in order to engage in reasoned model building and theoretical inquiry.

14.3.1 Ancient Philosophy

So-called common sense might appear to be inarticulately empiricist; and empiricism might be usefully thought of as a critical force resisting the pretensions of a more speculative rationalist philosophy. In the ancient world the kind of rationalism that many empiricists oppose was developed by Plato (c. 428–c. 328 BCE), the greatest of rationalist philosophers. The ground was prepared for him by three earlier bodies of thought: the Ionian cosmologies of the 6th century BCE, with their distinction between sensible appearance and a reality accessible only to pure reason; the philosophy of Parmenides (early 5th century BCE), the important early monist, in which purely rational argument is used to prove that the world is really an unchanging unity; and Pythagoreanism, which, holding that the world is really made of numbers, took mathematics to be the repository of ultimate truth.

The first empiricists in Western philosophy were the Sophists, who rejected such rationalist speculation about the world as a whole and took humanity and society to be the proper objects of philosophical inquiry. Invoking skeptical arguments to undermine the claims of pure reason, they posed a challenge that invited the reaction that comprised Plato's philosophy.

Plato, and to a lesser extent Aristotle, were both rationalists. But Aristotle's successors in the ancient Greek schools of Stoicism and Epicureanism advanced an explicitly empiricist account of the formation of human concepts. For the Stoics the human mind is at birth a clean slate, which comes to be stocked with concepts by the sensory impingement of the material world upon it. Yet they also held that there are some concepts or beliefs, the "common notions," that are present to the minds of all humans; and these soon came to be conceived in a nonempirical way. The empiricism of the Epicureans, however, was more pronounced and consistent. For them human concepts are memory images, the mental residues of previous sense experience, and knowledge is as empirical as the ideas of which it is composed.

³⁰¹"Definition of EMPIRIC," www.merriam-webster.com.

14.3.2 Medieval Philosophy

Most medieval philosophers after St. Augustine (354–430) took an empiricist position, at least about concepts, even if they recognized much substantial but nonempirical knowledge. The standard formulation of this age was: “There is nothing in the intellect that was not previously in the senses.” Thus St. Thomas Aquinas (1225–74) rejected innate ideas altogether. Both soul and body participate in perception, and all ideas are abstracted by the intellect from what is given to the senses. Human ideas of unseen things, such as angels and demons and even God, are derived by analogy from the seen.

The 13th-century scientist Roger Bacon emphasized empirical knowledge of the natural world and anticipated the polymath Renaissance philosopher of science Francis Bacon (1561–1626) in preferring observation to deductive reasoning as a source of knowledge. The empiricism of the 14th-century Franciscan nominalist William of Ockham was more systematic. All knowledge of what exists in nature, he held, comes from the senses, though there is, to be sure, “abstractive knowledge” of necessary truths; but this is merely hypothetical and does not imply the existence of anything. His more extreme followers extended his line of reasoning toward a radical empiricism, in which causation is not a rationally intelligible connection between events but merely an observed regularity in their occurrence.

14.3.3 Modern Philosophy

In the earlier and unsystematically speculative phases of Renaissance philosophy, the claims of Aristotelian logic to yield substantial knowledge were attacked by several 16th-century logicians; in the same century, the role of observation was also stressed. One mildly skeptical Christian thinker, Pierre Gassendi (1592–1655), advanced a deliberate revival of the empirical doctrines of Epicurus. But the most important defender of empiricism was Francis Bacon, who, though he did not deny the existence of a priori knowledge, claimed that, in effect, the only knowledge that is worth having (as contributing to the relief of the human condition) is empirically based knowledge of the natural world, which should be pursued by the systematic—indeed almost mechanical—arrangement of the findings of observation and is best undertaken in the cooperative and impersonal style of modern scientific research. Bacon was, in fact, the first to formulate the principles of scientific induction.

A materialist and nominalist, Thomas Hobbes (1588–1679) combined an extreme empiricism about concepts, which he saw as the outcome of material impacts on the bodily senses, with an extreme rationalism about knowledge, of which he took geometry to be the paradigm. For him all genuine knowledge is a priori, a matter of rigorous deduction from definitions. The senses provide ideas; but all knowledge comes from “reckoning,” from deductive calculations carried out on the names that the thinker has assigned to them. Yet all knowledge also concerns material

and sensible existences, since everything that exists is a body.³⁰² On the other hand, many of the most important claims of Hobbes's ethics and political philosophy certainly seem to be a posteriori, insofar as they rely heavily on his experience of human beings and the ways in which they interact.

The most elaborate and influential presentation of empiricism was made by John Locke (1632–1704), an early Enlightenment philosopher, in the first two books of his *Essay Concerning Human Understanding* (1690). All knowledge, he held, comes from sensation or from reflection, by which he meant the introspective awareness of the workings of one's own mind. Locke often seemed not to separate clearly the two issues of the nature of concepts and the justification of beliefs. His Book I, though titled "Innate Ideas," is largely devoted to refuting innate knowledge. Even so, he later admitted that much substantial knowledge—in particular, that of mathematics and morality—is a priori. He argued that infants know nothing; that if humans are said to know innately what they are capable of coming to know, then all knowledge is, trivially, innate; and that no beliefs whatever are universally accepted.

Locke was more consistent about the empirical character of all concepts, and he described in detail the ways in which simple ideas can be combined to form complex ideas of what has not in fact been experienced. One group of dubiously empirical concepts—those of unity, existence, and number—he took to be derived both from sensation and from reflection. But he allowed one a priori concept—that of substance—which the mind adds, seemingly from its own resources, to its conception of any regularly associated group of perceptible qualities.³⁰³

Bishop George Berkeley (1685–1753), a theistic idealist and opponent of materialism, applied Locke's empiricism about concepts to refute Locke's account of human knowledge of the external world. Because Berkeley was convinced that in sense experience one is never aware of anything but what he called "ideas" (mind-dependent qualities), he drew and embraced the inevitable conclusion that physical objects are simply collections of perceived ideas, a position that ultimately leads to phenomenalism—i.e., to the view that propositions about physical reality are reducible to propositions about actual and possible sensations. He accounted for the continuity and orderliness of the world by supposing that its reality is upheld in the perceptions of an unsleeping God. The theory of spiritual substance involved in Berkeley's position seems to be vulnerable, however, to most of the same objections as those that he posed against Locke. Although Berkeley admitted that he did not have an idea of mind (either his own or the mind of God), he claimed that he was able to form what he called a "notion" of it. It is not clear how to reconcile the existence of such notions with a thoroughgoing empiricism about concepts.

³⁰² H.C. Ezebuilo, "Locke, Berkeley and Hume: A Brief Survey of Empiricism," *International Journal of Research in Education, Humanities and Commerce* 1(2), (2020).

³⁰³ *Ibid.*

The Scottish skeptical philosopher David Hume (1711–76) fully elaborated Locke’s empiricism and used it reductively to argue that there can be no more to the concepts of body, mind, and causal connection than what occurs in the experiences from which they arise. Like Berkeley, Hume was convinced that perceptions involve no constituents that can exist independently of the perceptions themselves. Unlike Berkeley, he could find neither an idea nor a notion of mind or self, and as a result his radical empiricism contained an even more parsimonious view of what exists. While Berkeley thought that only minds and their ideas exist, Hume thought that only perceptions exist and that it is impossible to form an idea of anything that is not a perception or a complex of perceptions. For Hume all necessary truth is formal or conceptual, determined by the various relations that hold between ideas.

An attempt to resolve the controversy between empiricists and their opponents was made in the transcendental idealism of Kant, who drew upon both Hume and Gottfried Wilhelm Leibniz (1646–1716). With the dictum that, although all knowledge begins with experience it does not all arise from experience, he established a clear distinction between the innate and the a priori. He held that there are a priori concepts, or categories—substance and cause being the most important—and also substantial or synthetic a priori truths. Although not derived from experience, the latter apply to experience. A priori concepts and propositions do not relate to a reality that transcends experience; they reflect, instead, the mind’s way of organizing the amorphous mass of sense impressions that flow in upon it.

Lockean empiricism prevailed in 19th-century England until the rise of Hegelianism in the last quarter of the century. To be sure, the Scottish philosophers who followed Hume but avoided his skeptical conclusions insisted that humans do have substantial a priori knowledge. But the philosophy of John Stuart Mill (1806–1873) is thoroughly empiricist. He held that all knowledge worth having, including mathematics, is empirical. The apparent necessity and apriority of mathematics, according to Mill, is the result of the unique massiveness of its empirical confirmation. All real knowledge for Mill is inductive and empirical, and deduction is sterile. It is not clear that Mill consistently adhered to this position, however. In both his epistemology and his ethics, he sometimes seemed to recognize the need for first principles that could be known without proof.³⁰⁴ The philosopher of evolution Herbert Spencer (1820–1903) offered another explanation of the apparent necessity of some beliefs: they are the well-attested (or naturally selected) empirical beliefs inherited by living humans from their evolutionary ancestors. Two important mathematicians and pioneers in the philosophy of modern physics, William Kingdon Clifford (1845–1879) and Karl Pearson (1857–1936), defended radically empiricist philosophies of science, anticipating the logical empiricism of the 20th century.

³⁰⁴ Ibid.

14.3.4 Contemporary Philosophy

One of the most influential empiricists of the 20th century was the great British philosopher and logician Bertrand Russell (1872–1970). Early in his career Russell admitted both synthetic a priori knowledge and concepts of unobservable entities. Later, through discussions with his pupil Ludwig Wittgenstein (1889–1951), Russell became convinced that the truths of logic and mathematics are analytic and that logical analysis is the essence of philosophy. In his empiricist phase, Russell analyzed concepts in terms of what one is “directly acquainted” with in experience (where experience was construed broadly enough to include not only awareness of sense data but also awareness of properties construed as universals). In his neutral monist phase, he tried to show that even the concepts of formal logic are ultimately empirical, though the experience that supplies them may be introspective instead of sensory.

Doctrines developed by Russell and Wittgenstein influenced the German-American philosopher Rudolf Carnap (1891–1970) and the Vienna Circle, a discussion group in which the philosophy of logical positivism was developed. The empirical character of logical positivism is especially evident in its formulation of what came to be known as the “verification principle,” according to which a sentence is meaningful only if it is either tautologous or in principle verifiable on the basis of sense experience.

Later developments in epistemology served to make some empiricist ideas about knowledge and justification more attractive. One of the traditional problems faced by more radical forms of empiricism was that they seemed to provide too slender a foundation upon which to justify what humans think they know.³⁰⁵ If sensations can occur in the absence of physical objects, for example, and if what one knows immediately is only the character of one’s own sensations, how can one legitimately infer knowledge of anything else? Hume argued that the existence of a sensation is not a reliable indicator of anything other than itself. In contrast, adherents of a contemporary school of epistemology known as “**externalism**” have argued that sensations (and other mental states) can play a role in justifying what humans think they know, even though the vast majority of humans are unaware of what that role is. The idea behind one form of externalism, “reliablism,” is that a belief is justified when it is produced through a reliable process, namely a process that reliably produces true beliefs. Humans may be evolutionarily conditioned to respond to certain kinds of sensory stimuli with a host of generally true, and justified, beliefs about their environment. Thus, within the framework of externalist epistemology, empiricism might not lead so easily to skepticism.

In summary, philosophical empiricists hold no knowledge to be properly inferred or deduced unless it is derived from one’s sense-based experience. This view is commonly contrasted

³⁰⁵ Ibid.

with rationalism, which states that knowledge may be derived from reason independently of the senses. For example, John Locke held that some knowledge (such as knowledge of God's existence) could be arrived at through intuition and reasoning alone.³⁰⁶ Similarly Robert Boyle, a prominent advocate of the experimental method, held that we have innate ideas.³⁰⁷ The main continental rationalists (Descartes, Spinoza, and Leibniz) were also advocates of the empirical scientific method.³⁰⁸

Between 600 and 200 BC, the Vaisheshika school of Hindu philosophy, founded by the ancient Indian philosopher Kanada, accepted perception and inference as the only two reliable sources of knowledge.³⁰⁹ The Charvaka school held similar beliefs, asserting that perception is the only reliable source of knowledge while inference obtains knowledge with uncertainty. The earliest Western proto-empiricists were the empiric school of ancient Greek medical practitioners, founded in 330 BC.³¹⁰ Its members rejected the three doctrines of the dogmatic school, preferring to rely on the observation of phantasiai (i.e., phenomena, the appearances). The Empiric school was closely allied with Pyrrhonist school of philosophy, which made the philosophical case for their proto-empiricism.

The notion of *tabula rasa* (clean slate or blank tablet) connotes a view of mind as an originally blank or empty recorder (Locke used the words "white paper") on which experience leave mark. This deny that humans have innate ideas. The notion dates back to Aristotle (c. 350 BC): "What the mind (*nous*) thinks must be in it in the same sense as letters are on a tablet (*grammateion*) which bears no actual writing (*grammenon*); this is just what happens in the case of the mind."³¹¹

Aristotle's explanation of how this was possible was not strictly empiricist in a modern sense, but rather based on his theory of potentiality and actuality, and experience of sense perceptions still requires the help of the active *nous*. These notions contrasted with Platonic notions of the human mind as an entity that pre-existed somewhere in the heavens/world of form, before being sent down to join a body on Earth.³¹² Aristotle was considered to give a more important position to sense perception than Plato, and commentators in the Middle Ages summarized one of his positions as "*nihil in intellectu nisi prius fuerit in sensu*" (Latin for "nothing in the intellect without first being in the senses").

This idea was later developed in ancient philosophy by the stoic school, from about 330 BC. Stoic epistemology generally emphasized that the mind starts blank, but acquires knowledge as

³⁰⁶ Luis E. Loeb, *From Descartes to Hume: Continental Metaphysics and the Development of Modern Philosophy* (Ithaca, Cornell University Press, 1981), 56.

³⁰⁷ Ibid.

³⁰⁸ Ibid.

³⁰⁹ See D.P.S. Bhawuk, *Spirituality and Indian Psychology*, Anthony Marsella (ed.), (Indianapolis: Springer, 2011),172.

³¹⁰ "Greek Medicine: Alexander the Great," www.greekmedicine.net.

³¹¹ Aristotle, *On the Soul*, 3.4.430^a1

³¹² see Plato's *Phaedo* and *Apolog*.

the outside world is impressed upon it.³¹³ The doxographer Aetius summarizes this view as “When a man is born, the Stoics say, he has the commanding part of his soul like a sheet of paper ready for writing upon.”³¹⁴

During the Middle Ages (from the 5th to the 15th century BC) Aristotle’s theory of *tabula rasa* was developed by Islamic philosophers starting with Al Farabi (c. 872 – 951 BC), developing into an elaborate theory by Avicenna (c. 980 – 1037) and demonstrated as a thought experiment by Ibn Tufail. For Avicenna (Ibn Sina), for example, the *tabula rasa* is a pure potentiality that is actualized through education, and knowledge is attained through empirical familiarity with objects in this world from which one abstracts universal concepts developed through a syllogistic method of reasoning in which observations lead to propositional statements which when compounded lead to further abstract concepts³¹⁵. The intellect itself develops from a material intellect, which is a potentiality that can acquire knowledge to the active intellect, the state of the human intellect in conjunction with the perfect source of knowledge.³¹⁶ So the immaterial active intellect, separate from any individual person, is still essential for understanding to occur.

In the 12th century CE, the Andalusian Muslim philosopher and novelist Abu Bakr Ibn Tufail included the theory of *tabula rasa* as a thought experiment in his Arabic philosophical novel, *Hayy ibn Yaqdhan* in which he depicted the development of the mind of a feral child “from a *tabula rasa* to that of an adult, in complete isolation from society” on a desert island, through experience alone. The Latin translation of his philosophical novel, entitled *Philosophus Autodidactus*, published by Edward Pococke the Younger in 1671, had an influence on John Locke’s formulation of *tabula rasa* in *An Essay Concerning Human Understanding*.³¹⁷

A similar Islamic theological novel, *Theologus Autodidactus*, was written by the Arab theologian and physician Ibn al-Nafis in the 13th century. It also dealt with the theme of empiricism through the story of a feral child on a desert island, but departed from its predecessor by depicting the development of the protagonist’s mind through contact with society rather than in isolation from society.³¹⁸ During the 13th century Thomas Aquinas adopted the Aristotelian position that the senses are essential to the mind into scholasticism; while Bonaventure (1221–1274), one of Aquinas’ strongest intellectual opponents, offered some of the strongest arguments in favour of the Platonic idea of the mind.

³¹³Jeffrey Bardzell, *Speculative Grammar and Stoic Language Theory in Medieval Allegorical Narrative: From Prudentius to Alan of Lille* (New York: Routledge, 2014), 18–19.

³¹⁴Diels-Kranz, A.A. Long and D.N. Sedley (trans.), *The Hellenistic Philosophers* (Vol. 1) (Cambridge, Ma: Cambridge, 1987), 238.

³¹⁵Sajjad H. Rizvi (2006), “[Avicenna/Ibn Sina \(c. 980–1037\)](#),” [Internet Encyclopedia of Philosophy](#).

³¹⁶ Ibid.

³¹⁷G. A. Russell, *The ‘Arabick’ Interest of the Natural Philosophers in Seventeenth-Century England* (New York: Brill Publishers, 1994), 224.

³¹⁸ Ibid.

In the late renaissance, various writers began to question the medieval and classical understanding of knowledge acquisition in a more fundamental way. In political and historical writing Niccolò Machiavelli and his friend Francesco Guicciardini initiated a new realistic style of writing. Machiavelli in particular was scornful of writers on politics who judged everything in comparison to mental ideals and demanded that people should study the effectual truth instead. Their contemporary, Leonardo da Vinci (1452–1519) said, “If you find from your own experience that something is a fact and it contradicts what some authority has written down, then you must abandon the authority and base your reasoning on your own findings.”³¹⁹

Significantly, an empirical metaphysical system was developed by the Italian philosopher Bernardino Telesio which had an enormous impact on the development of later British philosophers such as Francis Bacon, who regarded Telesio as “the first of the moderns.”³²⁰ Telesio’s influence can also be seen on the French philosophers René Descartes and Pierre Gassendi.³²¹

The decidedly anti-Aristotelian and anti-clerical music theorist Vincenzo Galilei (c.1520–1591), father of Galileo and the inventor of monody, made use of the method in successfully solving musical problems, firstly, of tuning such as the relationship of pitch to string tension and mass in stringed instruments, and to the volume of air in wind instruments; and secondly to composition, by his various suggestions to composers. The Italian word he used for “experiment” was *esperienza*. It is known that he was the essential pedagogical influence upon the young Galileo, his eldest son, arguably one of the most influential empiricists in history. Vincenzo, through his tuning research, found the underlying truth at the heart of the misunderstood myth of ‘Pythagoras’ hammers’ (the square of the numbers concerned yielded those musical intervals, not the actual numbers, as believed), and through this and other discoveries that demonstrated the fallibility of traditional authorities, a radically empirical attitude developed, passed on to Galileo, which regarded “experience and demonstration” as the *sine qua non* of valid rational enquiry.

14.4 British Empiricism

British empiricism, a retrospective characterization, emerged during the 17th century as an approach to early modern philosophy and modern science. Although integral to this overarching transition, Francis Bacon, in England, advanced empiricism at 1620, whereas René Descartes, in France, upheld rationalism around 1640, a distinction drawn by Immanuel Kant, in Germany, near 1780. Contributing later in the 17th century, Thomas Hobbes and Baruch Spinoza are retrospectively identified likewise as an empiricist and a rationalist, respectively. In the Enlightenment during the 18th century, both George Berkeley, in England, and David Hume,

³¹⁹ Camillia Matuk, “Seeing the Body: The Divergence of Ancient Chinese and Western Medical Illustration,” *Journal of Bio-communication*, Vol. 32(1), (2006), 1.

³²⁰ Michaela Boenke, “Bernardino Telesio,” *The Stanford Encyclopedia of Philosophy* Edward N. Zalta (ed.), (2018), URL = <<https://plato.stanford.edu/archives/win2018/entries/telesio/>>.

³²¹ Ibid.

in Scotland, became leading exponents of empiricism, a lead preceded in the late 17th century by John Locke, also in England, hence the dominance of empiricism in British philosophy.

14.4.1 John Locke

In response to the early-to-mid-17th century continental rationalism, John Locke (1632–1704) proposed in *An Essay Concerning Human Understanding* (1689) a very influential view wherein the *only* knowledge humans can have is *a posteriori*, that is, based upon experience. Locke is famously attributed with holding the proposition that the human mind is a *tabula rasa*, a “blank tablet,” in Locke’s words “white paper,” on which the experiences derived from sense impressions as a person’s life proceeds are written. There are two sources of our ideas: sensation and reflection. In both cases, a distinction is made between simple and complex ideas. The former are unanalysable, and are broken down into primary and secondary qualities. Primary qualities are essential for the object in question to be what it is. Without specific primary qualities, an object would not be what it is. For example, an apple is an apple because of the arrangement of its atomic structure. If an apple were structured differently, it would cease to be an apple. Secondary qualities are the sensory information we can perceive from its primary qualities. For example, an apple can be perceived in various colours, sizes, and textures but it is still identified as an apple. Therefore, its primary qualities dictate what the object essentially is, while its secondary qualities define its attributes. Complex ideas combine simple ones, and dividethem into substances, modes, and relations. According to Locke, our knowledge of things is a perception of ideas that are in accordance or discordance with each other, which is very different from the quest for certainty of Descartes.

14.4.2 George Berkeley

A generation later, the Irish Anglican bishop, George Berkeley (1685–1753), determined that Locke’s view immediately opened a door that would lead to eventual atheism. In response to Locke, he put forth in his *Treatise Concerning the Principles of Human Knowledge* (1710) an important challenge to empiricism in which things *only* exist either as a *result* of their being perceived, or by virtue of the fact that they are an entity doing the perceiving. (For Berkeley, God fills in for humans by doing the perceiving whenever humans are not there to do it.) In his text *Alciphron*, Berkeley maintained that any order humans may see in nature is the language or handwriting of God.³²² Berkeley’s approach to empiricism would later come to be called subjective idealism.

14.4.3 David Hume

The Scottish philosopher David Hume (1711–1776) responded to Berkeley’s criticisms of Locke, as well as other differences between early modern philosophers, and moved empiricism to a new level of skepticism. Hume argued in keeping with the empiricist view that all knowledge is derived from sense experience, but he accepted that this has implications not normally acceptable to philosophers. He wrote, for example: Locke divides all arguments into demonstrative and

³²²Thornton Stephen “Berkeley’s Theory of Reality” in *The Journal of the Limerick Philosophical Society*, 1987, 60.

probable. On this view, we must say that it is only probable that all men must die or that the sun will rise to-morrow, because neither of these can be demonstrated. But to conform our language more to common use, we ought to divide arguments into demonstrations, proofs, and probabilities—by ‘proofs’ meaning arguments from experience that leave no room for doubt or opposition.³²³

And:

I believe the most general and most popular explication of this matter, is to say, that finding from experience, that there are several new productions in matter, such as the motions and variations of body, and concluding that there must somewhere be a power capable of producing them, we arrive at last by this reasoning at the idea of power and efficacy. But to be convinced that this explication is more popular than philosophical, we need but reflect on two very obvious principles. First, That reason alone can never give rise to any original idea, and secondly, that reason, as distinguished from experience, can never make us conclude, that a cause or productive quality is absolutely requisite to every beginning of existence. Both these considerations have been sufficiently explained: and therefore shall not at present be any farther insisted on.³²⁴

Hume divided all of human knowledge into two categories: *relations of ideas* and *matters of fact*. Mathematical and logical propositions (e.g. “that the square of the hypotenuse is equal to the sum of the squares of the two sides”) are examples of the first, while propositions involving some contingent observation of the world (e.g. “the sun rises in the East”) are examples of the second. All of people’s ideas, in turn, are derived from their “impressions.” For Hume, an impression corresponds roughly with what we call a sensation. To remember or to imagine such impressions is to have an idea. Ideas are therefore the faint copies of sensations.³²⁵

Hume maintained that no knowledge, even the most basic beliefs about the natural world, can be conclusively established by reason. Rather, he maintained, our beliefs are more a result of accumulated *habits*, developed in response to accumulated sense experiences.³²⁶ Among his many arguments Hume also added another important slant to the debate about scientific method—that of the problem of induction. He argued that it requires inductive reasoning to arrive at the premises for the principle of inductive reasoning, and therefore the justification for

³²³ D. Hume. [*“Of Probability,” Enquiries Concerning the Human Understanding and Concerning the Principles of Morals*](#) (Oxford: Clarendon Press, 1975).

³²⁴ Ibid., [*“Of the Idea of a Necessary Connexion.”*](#)

³²⁵ Cf. H.C. Ezebuilo, “Locke, Berkeley and Hume, 96-99.

³²⁶ Ibid.

inductive reasoning is a circular argument.³²⁷ Among Hume's conclusions regarding the problem of induction is that there is no certainty that the future will resemble the past. Thus, as a simple instance posed by Hume, we cannot know with certainty by inductive reasoning that the sun will continue to rise in the East, but instead come to expect it to do so because it has repeatedly done so in the past.

Hume concluded that such things as belief in an external world and belief in the existence of the self were not rationally justifiable. According to Hume these beliefs were to be accepted nonetheless because of their profound basis in instinct and custom. His lasting legacy, however, was the doubt that his skeptical arguments cast on the legitimacy of inductive reasoning, allowing many skeptics who followed to cast similar doubt.

14.4.3 Phenomenalism

Most of Hume's followers have disagreed with his conclusion that belief in an external world is *rationally* unjustifiable, contending that Hume's own principles implicitly contained the rational justification for such a belief, that is, beyond being content to let the issue rest on human instinct, custom and habit.³²⁸ According to an extreme empiricist theory known as phenomenalism, anticipated by the arguments of both Hume and George Berkeley, a physical object is a kind of construction out of our experiences. Phenomenalism is the view that physical objects, properties, events (whatever is physical) are reducible to mental objects, properties, events. Ultimately, only mental objects, properties, events, exist—hence the closely related term subjective idealism. By the phenomenistic line of thinking, to have a visual experience of a real physical thing is to have an experience of a certain kind of group of experiences. This type of set of experiences possesses a constancy and coherence that is lacking in the set of experiences of which hallucinations, for example, are a part. As John Stuart Mill put it in the mid-19th century, matter is the “permanent possibility of sensation.”³²⁹ Mill's empiricism went a significant step beyond Hume in still another respect: in maintaining that induction is necessary for *all* meaningful knowledge including mathematics. As summarized by D.W. Hamlin:

Mill claimed that mathematical truths were merely very highly confirmed generalizations from experience; mathematical inference, generally conceived as deductive [and *a priori*] in nature, Mill set down as founded on induction. Thus, in Mill's philosophy there was no real place for knowledge based on relations of ideas. In his view logical and mathematical necessity is psychological; we are merely unable to conceive any other possibilities than those that logical and mathematical propositions assert. This is

³²⁷ Ibid.

³²⁸ H. Morick, *Challenges to Empiricism* (Indianapolis: Hackett Publishing, 1980), 14.

³²⁹ J.S. Mill, “An Examination of Sir William Rowan Hamilton's Philosophy,” in A.J. Ayer and Ramond Winch (eds.), *British Empirical Philosophers* (New York, NY: Simon and Schuster, 1968), 51-52.

perhaps the most extreme version of empiricism known,
but it has not found many defenders.³³⁰

Mill's empiricism thus held that knowledge of any kind is not from direct experience but an inductive inference from direct experience. The problems other philosophers have had with Mill's position center around the following issues: Firstly, Mill's formulation encounters difficulty when it describes what direct experience is by differentiating only between actual and possible sensations. This misses some key discussion concerning conditions under which such "groups of permanent possibilities of sensation" might exist in the first place. Berkeley put God in that gap; the phenomenologists, including Mill, essentially left the question unanswered. In the end, lacking an acknowledgement of an aspect of reality that goes beyond mere possibilities of sensation, such a position leads to a version of subjective idealism.

Questions of how floor beams continue to support a floor while unobserved, how trees continue to grow while unobserved and untouched by human hands, etc., remain unanswered, and perhaps unanswerable in these terms.³³¹ Secondly, Mill's formulation leaves open the unsettling possibility that the "gap-filling entities are purely possibilities and not actualities at all."³³² Thirdly, Mill's position, by calling mathematics merely another species of inductive inference, misapprehends mathematics. It fails to fully consider the structure and method of mathematical science, the products of which are arrived at through an internally consistent deductive set of procedures which do not, either today or at the time Mill wrote, fall under the agreed meaning of induction.³³³

The phenomenalist phase of post-Humean empiricism ended by the 1940s, for by that time it had become obvious that statements about physical things could not be translated into statements about actual and possible sense data.³³⁴ If a physical object statement is to be translatable into a sense-data statement, the former must be at least deducible from the latter. But it came to be realized that there is no finite set of statements about actual and possible sense-data from which we can deduce even a single physical-object statement. The translating or paraphrasing statement must be couched in terms of normal observers in normal conditions of observation. There is, however, no *finite* set of statements that are couched in purely sensory terms and can express the satisfaction of the condition of the presence of a normal observer. According to phenomenism, to say that a normal observer is present is to make the hypothetical statement that were a doctor to inspect the observer, the observer would appear to the doctor to be normal. But, of course, the doctor himself must be a normal observer. If we are to specify this doctor's normality in sensory terms, we must make reference to a second doctor who, when inspecting the sense organs of the first doctor, would himself have to have the sense data a normal observer has when inspecting

³³⁰ "Empiricism," *Macmillan Encyclopedia of Philosophy*, vol.2, (1969), 503.

³³¹ *Ibid.*

³³² *Ibid.*

³³³ *Ibid.*

³³⁴ John Bolender, "Factual Phenomenalism: A Supervenience Theory," *Sorites*, no. 9, 16–31.

the sense organs of a subject who is a normal observer. And if we are to specify in sensory terms that the second doctor is a normal observer, we must refer to a third doctor, and so on.³³⁵

14.5 Logical Empiricism

Logical empiricism (also logical positivism or neopositivism) was an early 20th century attempt to synthesize the essential ideas of British empiricism (example, a strong emphasis on sensory experience as the basis for knowledge) with certain insights from mathematical logic that had been developed by Gottlob Frege and Ludwig Wittgenstein. Some of the key figures in this movement were Otto Neurath, Moritz Schlick and the rest of the Vienna Circle, along with A.J. Ayer, Rudolf Carnap and Hans Reichenbach.

The neopositivists subscribed to a notion of philosophy as the conceptual clarification of the methods, insights and discoveries of the sciences. They saw in the logical symbolism elaborated by Frege (1848–1925) and Bertrand Russell (1872–1970) a powerful instrument that could rationally reconstruct all scientific discourse into an ideal, logically perfect, language that would be free of the ambiguities and deformations of natural language. This gave rise to what they saw as metaphysical pseudoproblems and other conceptual confusions. By combining Frege’s thesis that all mathematical truths are logical with the early Wittgenstein’s idea that all logical truths are mere linguistic tautologies, they arrived at a twofold classification of all propositions: the analytic (*a priori*) and the synthetic (*a posteriori*).³³⁶ On this basis, they formulated a strong principle of demarcation between sentences that have sense and those that do not: the so-called “verification principle”. Any sentence that is not purely logical, or is unverifiable, is devoid of meaning. As a result, most metaphysical, ethical, aesthetic and other traditional philosophical problems came to be considered pseudoproblems.³³⁷

In the extreme empiricism of the neopositivists, any genuinely synthetic assertion must be reducible to an ultimate assertion (or set of ultimate assertions) that expresses direct observations or perceptions. In later years, Carnap and Neurath abandoned this sort of *phenomenalism* in favor of a rational reconstruction of knowledge into the language of an objective spatio-temporal physics. That is, instead of translating sentences about physical objects into sense-data, such sentences were to be translated into so-called *protocol sentences*, for example, “X at location Y and at time T observes such and such.”³³⁸ The central theses of logical positivism (verificationism, the analytic–synthetic distinction, reductionism, etc.) came under sharp attack by thinkers such as Nelson Goodman, W.V. Quine, Hilary Putnam, Karl Popper, and Richard Rorty. By the late 1960s, it had become evident to most philosophers that the movement had

³³⁵ Roderick Chisholm M., “The Problem of Empiricism,” *The Journal of Philosophy*, 45(19), (1948), 512–13.

³³⁶ Peter Achinstein, and Stephen F. Barker, *The Legacy of Logical Positivism: Studies in the Philosophy of Science* (Baltimore: Johns Hopkins University Press, 1969).

³³⁷ Ibid.

³³⁸ Nicholas Rescher, *The Heritage of Logical Positivism* (Lanham: University Press of America, 1985, 244.

pretty much run its course, though its influence is still significant among contemporary analytic philosophers such as Michael Dummett and other anti-realists.

14.6 Criticism and Evaluation

The earliest expressions of empiricism in ancient Greek philosophy were those of the Sophists. In reaction to them, Plato presented the rationalistic view that humans have only “opinion” about changing, perceptible, existing things in space and time; that “knowledge” can be had only of timeless, necessary truths; and that the objects of knowledge—the unchanging and imperceptible forms or universals (such as the Beautiful, the Just, and so on)—are the only things that are truly real. The circles and triangles of geometrical “knowledge,” in this view, are quite different in their perfect exactness from the approximately circular and triangular things present to human senses. In his dialogue the *Phaedo*, Plato expounded a theory of literally innate ideas; humans, for example, have a conception of exact Equality, which, since it could not have been supplied by the senses, must have been acquired by the soul before it was embodied.

Aristotle agreed with Plato that knowledge is of the universal but held that such universal forms should not be conceived as “separated” from the matter embodying them. This belief does not make Aristotle an empiricist, though he was certainly a less extreme rationalist than Plato. Aristotle took the rationalist view that every science or body of knowledge must resemble “Euclidean geometry” in consisting of deductions from first principles that are self-evidently and necessarily true and that, although the senses acquaint humans with the sensible forms of things, there cannot be knowledge of them unless reason is brought into play to apprehend their intelligible forms.

The Stoic view of “common notions,” or beliefs that are held by all humans—a potentially rationalistic element in an otherwise empirical school of thought—was expanded during the early medieval period by St. Augustine, a thoroughgoing rationalist. The Stoic common notions, Augustine held, are truths that God has implanted in the human mind through direct illumination.

Although the early modern expression of empiricism in the 17th century by Francis Bacon heralded the scientific age, its influence was lessened by his failure to appreciate the revolutionary use of mathematics that comprised the genius of Galileo’s new physics and, even more fundamentally, by his underestimation of the need for imaginative conjecture in the formation of scientific hypotheses to restrict the overwhelming number of facts that would otherwise have to be handled. In contrast to Bacon’s view, the philosopher and mathematician René Descartes (1596–1650), one of the principal founders of modern thought, developed a form of rationalism that was more immediately influential. For Descartes some of the ideas that are critically important for philosophy, mathematics, and physics are innate, and sense experience is at most the agency that elicits these ideas. In principle, much of human knowledge is a priori and demonstrable by pure reasoning, but in practice, because the human

intellect is finite, it is necessary to rely on experience to confirm these propositions when rational proof is beyond reach.

In England, innate ideas and knowledge were defended by Edward Lord Herbert of Cherbury (1582–1648), whose philosophy was a precursor of Deism, and by a school of Puritan humanists known as the Cambridge Platonists. The case for innate ideas, however, is hard to establish; there can be in the nature of the case little actual evidence that one can possess concepts before having had some relevant experience.

In the second half of the 17th century, the empiricist views of Locke were similarly controverted by Leibniz,³³⁹ who examined Locke's views in minute detail arguing that ideas can be virtually innate in a less trivial sense than Locke allowed. Interpreting Locke's notion of reflection as reasoning rather than as introspection, Leibniz supposed that Locke was more of a rationalist than he really was.

In contemporary philosophy, there are thinkers who, though broadly sympathetic to logical positivism, have voiced reservations about some of the doctrines often associated with traditional empiricism. One important philosopher of science, Karl Popper (1902–1994), rejected the inductivism that views the growth of empirical knowledge as the result of a mechanical routine of generalization based on experienced correlations. Popper argued that a statement is empirical if it is falsifiable by experience,³⁴⁰ that is, if there are possible experiences that would show that the statement is false. Given the central role that experience plays in falsification, however, Popper still fell squarely within the empiricist camp.

An influential American philosopher and logician, W.V.O. Quine (1908–2000), was critical of the logical positivists' frequent recourse to the concept of meaning and rejected the sharp distinction they made between analytic and synthetic truths. Quine held that human concepts and beliefs are the joint outcome of experience and convention, and he denied that the role of the two factors can be as readily distinguished as empiricists assert.

The theory of knowledge has been one of the central disciplines of Western philosophy since the 17th century, and its most basic issue is that between empiricism and rationalism, an issue that is still being actively debated. On the one hand, the idea that science rests on substantial but nonempirical presuppositions has been put in question by the fact that in some areas it seems to get along without them: without conservation in cosmology, without causality in quantum physics. On the other hand, the traditional theory of the innate powers of the mind was reanimated by the considerations underlying the theory of language offered by the American linguist Noam Chomsky, who holds that the learning of

³³⁹ Leibniz, "New Essay Concerning Human Understanding," <https://www.britannica.com/topic/new-essay-concerning-human-understanding/>

³⁴⁰ H.C. Ezebuilo, "Locke, Berkeley and Hume: A Brief Survey of Empiricism," *International Journal of Research in Education, Humanities and Commerce* 1(2), (2020).

language is far too rapid and too universal to be attributed entirely to an empirical process of conditioning.³⁴¹ The basic strength of empiricism consists in its recognition that human concepts and beliefs apply to a world outside oneself, and that it is by way of the senses that this world acts upon the individual. The question, however, of how much the mind itself contributes to the task of processing its sensory input is one that has remained unanswered.

³⁴¹ Stephen P. Stich, Between Chomskian Rationalism and Popperian EMpericism. *The British Journal for the Philosophy of Science* 30(4), 1979,329-347.