

CHAPTER FIFTEEN

RATIONALISM

15.1 What is Rationalism?

Rationalism is the epistemological view that reason is the chief source of knowledge and the main determinant of what constitutes knowledge. More broadly, it can also refer to any view which appeals to reason as a source of knowledge or justification. Rationalism is one of the two classical views in epistemology, the other being empiricism. Rationalists claim that the mind, through the use of reason, can directly grasp certain truths in various domains, including logic, mathematics, ethics, and metaphysics. Rationalist views can range from modest views in mathematics and logic (such as that of Gottlob Frege) to ambitious metaphysical systems (such as that of Baruch Spinoza). Some of the most famous rationalists include Plato, René Descartes, Baruch Spinoza, and Gottfried Leibniz.

Rationalism is the view that regards reason as the main source and test of knowledge. Holding that reality itself has an inherently logical structure, the rationalist asserts that a class of truths exists that the intellect can grasp directly. There are, according to the rationalists, certain rational principles—especially in logic and mathematics, and even in ethics and metaphysics—that are so fundamental that to deny them is to fall into contradiction. The rationalists' confidence in reason and proof tends, therefore, to detract from their respect for other ways of knowing.

Rationalism has long been the rival of empiricism, the doctrine that all knowledge comes from, and must be tested by, sense experience. As against this doctrine, rationalism holds reason to be a faculty that can lay hold of truths beyond the reach of sense perception, both in certainty and generality. In stressing the existence of a “natural light,” rationalism has also been the rival of systems claiming esoteric knowledge, whether from mystical experience, revelation, or intuition, and has been opposed to various irrationalisms that tend to stress the biological, the emotional or volitional, the unconscious, or the existential at the expense of the rational.

15.2 Expressions of Rationalism

Rationalism has somewhat different meanings in different fields, depending upon the kind of theory to which it is opposed. In the psychology of perception, for example, rationalism is in a sense opposed to the *genetic psychology* of the Swiss scholar Jean Piaget (1896–1980), who, exploring the development of thought and behaviour in the infant, argued that the categories of the mind develop only through the infant's experience in concourse with the world. Similarly, rationalism is opposed to *transactionalism*, a point of view in psychology according to which human perceptual skills are achievements, accomplished through actions performed in response to an active environment. On this view, the experimental claim is made that perception is conditioned by probability judgments formed on the basis of earlier actions performed in similar

situations. As a corrective to these sweeping claims, the rationalist defends a *nativism*, which holds that certain perceptual and conceptual capacities are innate—as suggested in the case of depth perception by experiments with “the visual cliff,” which, though platformed over with firm glass, the infant perceives as hazardous—though these native capacities may at times lie dormant until the appropriate conditions for their emergence arise.

In the comparative study of languages, a similar nativism was developed beginning in the 1950s by the linguistic theorist Noam Chomsky, who, acknowledging a debt to René Descartes (1596–1650), explicitly accepted the rationalistic doctrine of “innate ideas.” Though the thousands of languages spoken in the world differ greatly in sounds and symbols, they sufficiently resemble each other in syntax to suggest that there is “a schema of universal grammar” determined by “innate presettings” in the human mind itself. These presettings, which have their basis in the brain, set the pattern for all experience, fix the rules for the formation of meaningful sentences, and explain why languages are readily translatable into one another. It should be added that what rationalists have held about innate ideas is not that some ideas are full-fledged at birth but only that the grasp of certain connections and self-evident principles, when it comes, is due to inborn powers of insight rather than to learning by experience.

Common to all forms of speculative rationalism is the belief that the world is a rationally ordered whole, the parts of which are linked by logical necessity and the structure of which is therefore intelligible. Thus, in metaphysics it is opposed to the view that reality is a disjointed aggregate of incoherent bits and is thus opaque to reason. In particular, it is opposed to the logical atomisms of such thinkers as David Hume (1711–76) and the early Ludwig Wittgenstein (1889–1951), who held that facts are so disconnected that any fact might well have been different from what it is without entailing a change in any other fact. Rationalists have differed, however, with regard to the closeness and completeness with which the facts are bound together. At the lowest level, they have all believed that the law of contradiction “A and not-A cannot coexist” holds for the real world, which means that every truth is consistent with every other; at the highest level, they have held that all facts go beyond consistency to a positive coherence; that is, they are so bound up with each other that none could be different without all being different.

In epistemology where its claims are clearest, rationalism holds that at least some human knowledge is gained through a priori (prior to experience), or rational, insight as distinct from sense experience, which too often provides a confused and merely tentative approach. In the debate between empiricism and rationalism, empiricists hold the simpler and more sweeping position, the Humean claim that all knowledge of fact stems from perception. Rationalists, on the contrary, urge that some, though not all, knowledge arises through direct apprehension by the intellect. What the intellectual faculty apprehends is objects that transcend sense experience—universals and their relations. A universal is an abstraction, a characteristic that may reappear in various instances: the number three, for example, or the triangularity that all triangles have in common, or the humanity that all human beings have in common. Though these cannot be seen,

heard, or felt, rationalists point out that humans can plainly think about them and about their relations.

This kind of knowledge, which includes the whole of logic and mathematics as well as fragmentary insights in many other fields, is, in the rationalist view, the most important and certain knowledge that the mind can achieve. Such a priori knowledge is both necessary (that, it cannot be conceived as otherwise) and universal, in the sense that it admits of no exceptions. In the philosophy of Immanuel Kant (1724–1804), epistemological rationalism finds expression in the claim that the mind imposes its own inherent categories or forms upon incipient experience.

In ethics, rationalism holds the position that reason, rather than feeling, custom, or authority, is the ultimate court of appeal in judging good and bad, right and wrong. One of the most notable representatives of rational ethics is Kant, who held that the way to judge an act is to check its self-consistency as apprehended by the intellect: to note, first, what it is essentially, or in principle—a lie, for example, or a theft—and then to ask if one can consistently will that the principle be made universal. Is theft, then, right? The answer must be “No,” because, if theft were generally approved, people’s property would not be their own as opposed to anyone else’s, and theft would then become meaningless; the notion, if universalized, would thus destroy itself, as reason by itself is sufficient to show.

In religion, rationalism commonly means that all human knowledge comes through the use of natural faculties, without the aid of supernatural revelation. “Reason” is here used in a broader sense, referring to human cognitive powers generally, as opposed to supernatural grace or faith—though it is also in sharp contrast to so-called existential approaches to truth. Reason, for the rationalist, thus stands opposed to many of the religions of the world, including Christianity, which have held that the divine has revealed itself through inspired persons or writings and which have required, at times, that its claims be accepted as infallible, even when they do not accord with natural knowledge. Religious rationalists hold, on the other hand, that if the clear insights of human reason must be set aside in favour of alleged revelation, then human thought is everywhere rendered suspect—even in the reasonings of the theologians themselves. There cannot be two ultimately different ways of warranting truth, they assert; hence rationalism argues that reason, with its standard of consistency, must be the final court of appeal. Religious rationalism can reflect either a traditional piety, when endeavouring to display the alleged sweet reasonableness of religion, or an antiauthoritarian temper, when aiming to supplant religion with the “goddess of reason.”

15.3 History of Rationalism

15.3.1 Epistemological Rationalism in Ancient Philosophies

The first Western philosopher to stress rationalist insight was Pythagoras, a shadowy figure of the 6th century BCE. Noticing that, for a right triangle, a square built on its hypotenuse equals the sum of those on its sides and that the pitches of notes sounded on a lute bear a mathematical relation to the lengths of the strings, Pythagoras held that these harmonies reflected the ultimate nature of reality. He summed up the implied metaphysical rationalism in the words “All is number.” It is probable that he had caught the rationalist’s vision, later seen by Galileo (1564–1642), of a world governed throughout by mathematically formulable laws.

The difficulty in this view, however, is that, working with universals and their relations, which, like the multiplication table, are timeless and changeless, it assumes a static world and ignores the particular, changing things of daily life. The difficulty was met boldly by the rationalist Parmenides (born c. 515 BCE), who insisted that the world really is a static whole and that the realm of change and motion is an illusion, or even a self-contradiction. His disciple Zeno of Elea (c. 495–c. 430 BCE) further argued that anything thought to be moving is confronted with a row of points infinite in number, all of which it must traverse; hence it can never reach its goal, nor indeed move at all. Of course, perception tells us that we do move, but Zeno, compelled to choose between perception and reason, clung to reason.

The exalting of rational insight above perception was also prominent in Plato (c. 427–c. 347 BCE). In the *Meno*, Socrates (c. 470–399 BCE) dramatized the innateness of knowledge by calling upon an illiterate slave boy and, drawing a square in the sand, proceeding to elicit from him, step by step, the proof of a theorem in geometry of which the boy could never have heard (to double the size of a square, draw a square on the diagonal). Such knowledge, rationalists insist, is certain, universal, and completely unlearned.

Plato so greatly admired the rigorous reasoning of geometry that he is alleged to have inscribed over the door of his Academy the phrase “Let no one unacquainted with geometry enter here.” His famous forms are accessible only to reason, not to sense. But how are they related to sensible things? His answers differed. Sometimes he viewed the forms as distilling those common properties of a class in virtue of which one identifies anything as a member of it. Thus, what makes anything a triangle is its having three straight sides; this is its essence. At other times, Plato held that the form is an ideal, a non-sensible goal to which the sensible thing approximates; the geometer’s perfect triangle “never was on sea or land,” though all actual triangles more or less embody it. He conceived the forms as more real than the sensible things that are their shadows and saw that philosophers must penetrate these invisible essences and see with their mind’s eye how they are linked together. For Plato they formed an orderly system that was at once eternal, intelligible, and good.

Plato's successor Aristotle (384–322 BCE) conceived of the work of reason in the same way, though he did not view the forms as independent. His chief contribution to rationalism lay in his syllogistic logic, regarded as the chief instrument of rational explanation. Humans explain particular facts by bringing them under general principles. Why does one think Socrates will die? Because he is human, and humans are mortal. Why should one accept the general principle itself that all humans are mortal? In experience such principles have so far held without exception. But the mind cannot finally rest on this sort of explanation. Humans never wholly understand a fact or event until they can bring it under a principle that is self-evident and necessary; they then have the clearest explanation possible. On this central thesis of rationalism, the three great Greeks were in accord. Nothing comparable in importance to their thought appeared in rationalistic philosophy in the next 1,800 years, though the work of St. Thomas Aquinas (c. 1225–74) was an impressive attempt to blend Greek rationalism and Christian revelation into a single harmonious system.

15.3.2 Epistemological Rationalism in Modern Philosophies

The first modern rationalist was Descartes, an original mathematician whose ambition was to introduce into philosophy the rigour and clearness that delighted him in mathematics. He set out to doubt everything in the hope of arriving in the end at something indubitable. This he reached in his famous *cogito ergo sum*, "I think, therefore I am"; for to doubt one's own doubting would be absurd. Here then was a fact of absolute certainty, rendered such by the clearness and distinctness with which it presented itself to his reason. His task was to build on this as a foundation, to deduce from it a series of other propositions, each following with the same self-evidence. He hoped thus to produce a philosophical system on which people could agree as completely as they do on the geometry of Euclid. The main cause of error, he held, lay in the impulsive desire to believe before the mind is clear. The clearness and distinctness upon which he insisted was not that of perception but of conception, the clearness with which the intellect grasps an abstract idea, such as the number three or its being greater than two.

His method was adopted in essentials by both Benedict Spinoza (1632–77) and G.W. Leibniz (1646–1716), who agreed that the framework of things could be known by a priori thinking. They differed from him, however, in their starting points. What was most undeniable to Spinoza was not the existence of his self but that of the universe, called by him "substance." From the idea of substance, and with the aid of a few definitions and axioms, he derived his entire system, which he set forth in his *Ethics* in a formal fashion patterned after Euclid's geometry. Still, for both Spinoza and Leibniz much in nature remained stubbornly opaque. Leibniz distinguished necessary truths, those of which the opposite is impossible (as in mathematics), from contingent truths, the opposite of which is possible, such as "snow is white." But was this an ultimate distinction? At times Leibniz said boldly that if only humans knew

enough, they would see that every true proposition was necessarily true—that there are no contingent truths, that snow must be white.

How, then, does reason operate and how is it possible to have knowledge that goes beyond experience? A new answer was given by Immanuel Kant in his *Critique of Pure Reason* (1781; 1787), which, as he said, involved a Copernican revolution in philosophy. The reason that logic and mathematics will remain valid for all experience is simply that their framework lies within the human mind; they are forms of arrangement imposed from within upon the raw materials of sensation. Humans will always find things arranged in certain patterns because it is they who have unwittingly so arranged them. Kant held, however, that these certainties were bought at a heavy price. Just because *a priori* insights are a reflection of the mind, they cannot be trusted as a reflection of the world outside the mind. Whether the rational order in which sensation is arranged—the order, for example, of time, space, and causality—represents an order holding among things-in-themselves (German *Dinge-an-sich*) which cannot be known. Kant's rationalism was thus the counterpart of a profound skepticism.

G.W.F. Hegel (1770–1831), the most thoroughgoing of rationalist thinkers, attempted to break out of this skepticism. He argued that to think of an unknowable is already to bring it within the sphere of what is known and that it is meaningless to talk of a region in which logic is invalid. Further, to raise the question “Why?” is to presume that there is an intelligible answer to it; indeed, the faith of the philosopher must be that the real is the rational and the rational real, for this faith is implicit in the philosophical enterprise itself. As an attempt to understand and explain the world, philosophy is a process of placing something in a context that reveals it as necessary. But this necessity is not, as earlier rationalists had supposed, an all-or-nothing affair issuing in a self-evident finality. Understanding is a matter of degree. What alone would wholly satisfy thought is a system that is at once all-inclusive and so ordered that its parts entail each other. Hegel believed that the universe constitutes such a whole and, as an idealist, held that it is a single, absolute mind. To the degree that philosophers embody and realize this mind, their own minds will achieve both truth and reality. Indeed, the advance of civilization reflects the enlarging presence and control of such a system in the human spirit. Broadly similar rationalistic systems were developed in England by F.H. Bradley (1846–1924) and Bernard Bosanquet (1848–1923) and in America by Josiah Royce (1855–1916). However, we shall consider the works of these major rationalists

Major Proponents of Rationalism

While the roots of Rationalism may go back to the Eleatics and Pythagoreans of ancient Greece, or at least to Socrates, Plato, Aristotle and the Neo-Platonists, the definitive formulation of the theory had to wait until the seventeenth Century philosophers of the Age of Reason.

René Descartes is one of the earliest and best known proponents of Rationalism. He believed that knowledge of eternal truths (e.g. mathematics and the epistemological and metaphysical foundations of the sciences) could be attained by reason alone, without the need for any sensory experience. Other knowledge (such as the knowledge of physics) required experience of the world, aided by the scientific method - a moderate rationalist position. For instance, his famous dictum "*Cogito ergo sum*" (*I think, therefore I am*) is a conclusion reached *apriori* and not through an inference from experience. Descartes held that some ideas (innate ideas) come from God; other ideas are derived from sensory experience; and still others are fictitious (created by the imagination). Of these, the only ideas which are certainly valid, according to Descartes, are those which are innate.

Baruch Spinoza expanded upon Descartes' basic principles of Rationalism. His philosophy centered on several principles, most of which relied on his notion that God is the only absolute substance (similar to Descartes' conception of God), and that substance is composed of two attributes, thought and extension. He believed that all aspects of the natural world (including Man) were modes of the eternal substance of God, and can therefore only be known through pure thought or reason.

Gottfried Leibniz attempted to rectify what he saw as some of the problems that were not settled by Descartes. This he did by combining Descartes' work with Aristotle's notion of form and his own conception of the universe as composed of monads. He believed that ideas exist in the intellect innately, but only in a virtual sense, and it is only when the mind reflects on itself that those ideas are actualized.

Immanuel Kant started as a traditional rationalist, having studied Leibniz and Christian Wolff (1679 - 1754). After studying the empiricist David Hume's works, he developed a distinctive and very influential Rationalism of his own, which attempted to synthesize the traditional rationalist and empiricist traditions.

Descartes

The advent of the Age of Science, mathematical sciences such as arithmetic, geometry etc., alongside the Renaissance came with a new outlook of the world, which involved a paradigm shift from the previous foundations of Philosophy and academic discourse in general. Philosophers struggled to get rid of its footings on Scholasticism and Aristotelian foundation. History records the wave of thought at the beginning of this age as 'Continental Rationalism' which was pioneered by René Descartes and later propagated by Baruch Spinoza and Gottfried Leibniz. They maintain that genuine knowledge has its foundation in thought or reason. According to them, the mind is full of rational content, inborn ideas, and innate principles.

Dethronement of Traditional Philosophy

René Descartes (1596-1650) often known in Latin as Renatus Cartesius, born in the town of *La Haye* in Touraine, Brittany, France, studied Logic, Mathematics and Philosophy at the renowned Jesuit college of Le Fleche. His major works include; *Discourse on Method* (1637), *Meditations on First Philosophy* (1641) and *Principles of Philosophy* (1644). Descartes was chiefly concerned with the problem of intellectual certainty. Unsatisfied by the methods of his predecessors and pressured by the urge to break away from a ‘Philosophy’ having its roots in uncertainties, dogmas, and hearsays, René Descartes by means of the certitude of mathematics and influenced by the **sciences** of his time, sought to establish a rational foundation for his philosophy which would be so certain in an unassailable manner. He insists that “nothing solid could have been built upon such shaky foundations”³⁴² (the foundations of past philosophies and false doctrines). Impressed by the exactness of Mathematics, he believed that the basis for his own philosophy would be a truth apprehended by the mind alone which would be self-evident and reliable like the mathematical theorems. He says, “I resolved one day to undertake studies within myself too and to use all the powers of my mind in choosing the paths I should follow.”³⁴³

Enthronement of the Cartesian Methods

Descartes did not find the traditional Aristotelian style of Logic appealing and leading to indubitable. For him, Aristotle’s deductive logic (syllogism) does not lead to the discovery of any new facts. Rather, it draws inferences from one already existing fact to the other. Against this unreliable system, Descartes enthrones his own methods of **intuition** and **deduction** as the only two guaranteed ways of arriving at indubitable truth(s). For Descartes, intuition is the conception which an unclouded and attentive mind gives us so readily and distinctly that we are wholly freed from doubt about that which we understand which springs from the light of reason alone. Deduction on the other hand follows from what is given us in intuition and also leads us to an indubitable truth. According to Descartes, deduction is that by which we understand all necessary inference of other facts that are known with certainty. The first principles are given alone by intuition while the remote conclusions are foregrounded by deduction.

Descartes’ Methodological Skepticism

Descartes was of the idea that before imploring the light of reason to acquire intuitive truths, he needs to exhume himself of all previously held beliefs. He points out that our firm opinions and beliefs originate from the senses and since these capacities (senses of perception) are deceptive, because the perceptions gotten through them are inconsistent, vague, illusive, and therefore cannot to be trusted. To begin with, Descartes suggests that one needs to primarily investigate the foundations on which all previously held opinions depend, on account of their dubitability. This must be done cautiously for even the highly undoubtful and improbable of our beliefs could appear false. Firstly, doubt has to be the starting point for his search of certainty. Secondly, ‘all’ previous beliefs must be subject to doubt provided they can be doubted. Thirdly, that which

³⁴²René Descartes, *Discourse on the Method*, trans. John Cottingham, Robert Stoothoff, and Dugald Murdoch, in *The Philosophical Writings of Descartes*, vol. 1 (Cambridge, England: Cambridge University Press, 1985), 1.9, 115.

³⁴³*Ibid.*, 1.10, 116.

is doubted must be considered false until proven indubitable. However, in doubting these sorts of beliefs, Descartes is not asserting extreme skepticism. His position is more properly labeled as “methodological skepticism” for he uses the skeptical stance as a tool or method for testing his beliefs; hence the name, Methodic Doubt.

***Cogito Ergo Sum*- Descartes’ Archimedean Point**

Descartes earlier stated that in his rigorous search for a solid foundation for philosophy, he had to discard all erroneous beliefs. He then notes that if he could find just one thing, however slight, that is certain and unshakable, that would be sufficient to counter his doubts and establish a philosophy. He continued in his system of methodic doubt until a point where he recognized that he could no longer doubt the fact that he was doubting. Like Augustine’s theory of Divine illumination, the light of reason shown upon Descartes at this point revealing to him that the fact that he was doubting implied that he was thinking, and to think, implied that he exists. Thus, he exclaimed *cogito ergo sum*- I think, therefore I exist. It is the internal condition of the act of doubting which escapes doubt. Hence, this implies that the metaphysical doubt of the existence of the thinking subject is rendered absurd by the awareness of the act of its doubting itself. Considered to be a truth so clear, distinct, and certain to the mind, Descartes established the *cogito* as his sure foundation on which he sets to build his entire philosophical thoughts.

Other Deductive Truths

Using the *cogito* as his standing point for philosophical reflections and meditations, Descartes set out to prove how he could arrive at other indubitable truths by means of deduction. He presented the *cogito* as a self-evident truth arrived at by means of intuition. He further deduces the existence of God from this proposition. His argument can simply be arranged in the following manner:

- I know that I exist, and that I have an idea of an infinite perfect Being (God).
- This idea of an infinite perfect Being cannot be created by a finite imperfect being
- I am a finite imperfect being and therefore not the cause of this infinite perfect idea.
- There necessarily exists an infinite perfect being that created this infinite perfect idea.
- This infinite perfect being is God and he necessarily exists.

This follows the ontological argument style of St. Anselm used in proving God’s existence. Though this argument has been flawed from various thinkers, Descartes believes that the proof of God’s existence is also an indubitable truth deduced from the proof of his very own existence- the *cogito*.

Sources of Human Knowledge

Descartes is considered as a renowned dualist for his conception of two major substances in the human person namely: *res cogitans* (thinking substance) and *res extensa* (extending substance). Where the former referred to the mind and all mental properties, the latter referred to the bodily organs which were responsible for sensory perception. He recognizes both the mind and senses as two distinct apparatuses that facilitated the acquiring of knowledge. Nevertheless, being at

the for-front of Rationalism, he denigrates knowledge gotten through the sense as unreliable and illusive. He holds the abstract truths apprehended by the mind through reason as the only reliable kind of knowledge.

Spinoza

Another continental rationalist worthy of note is Benedict Baruch Spinoza (1632-1677) a Portuguese Jew. He was highly influenced by René Descartes that the method of Geometry would give us true knowledge of reality. Thus, he attempted writing a geometry of Philosophy. His most prominent works include: *Principles of Cartesian Philosophy* (1663) *Theologico-Political Treatise* (1670), and *Ethics Demonstrated in Geometrical Order* which contained a total of 259 demonstrated propositions. Continuing to follow Euclid's style, Spinoza through his 250 axioms attempted to explain the whole of reality in a systematic arrangement of true ideas. As conclusions are demonstrated in geometry, Spinoza believed that the theories of nature could also be demonstrated. He thus retorted that our rational powers could form ideas that reflect the true nature of things. For him, every clear and distinct idea or definition is "true." In other words, every true idea gives a true picture of reality because the order and connection of ideas is the same as the order and connection of things in reality.

The Idea of God

Where Descartes began his philosophy with the *cogito*- a clear and distinct conception of his very own existence, Spinoza speculated that every rational enterprise that seeks to be free from all forms of error must first begin with the formulation of the 'idea of God'. For him, God is prior to everything else. To know something is to know the cause and God is the first cause. All that happens to exist develop their being in God and thus, no idea can be conceived without God. According to Spinoza, God is a being absolutely infinite. All elements of reality/nature only reflect some of the infinite attributes of this Eternal Being. Reality is therefore One- God, which manifests in all individuating substances. By so doing, where Descartes could be said to be a Dualist, Spinoza was basically a Monist for he believed the whole of reality is a Unity.

The Types of Ideas

Spinoza theorized that an idea is nothing else outside rational sensation. Notwithstanding, only the rational powers of the mind could lead man to the formulation of ideas that reflect the exact nature of objects i.e., the essences of things. For him, every clear and distinct idea is true and accurately reflects the ideal picture of reality. In other words, to know a thing is to know its essence. He further distinguished between three major types of ideas:

True Idea: this refers to a simple idea i.e., an idea that is clear, distinct and self-evident. For example, the idea of God.

False Idea: this refers to a perception clouded in confusion. It is not clear, distinct or self-evident. It is inadequate and does not affirm of a thing what is contained in its form.

Doubt: this arises when an idea is not clear and distinct enough for us to be able to draw any conclusion with regards its true nature or essence.

The Four Levels of Knowledge

- a. **Hearsay:** this refers to a kind of knowledge which is uncertain. As the name suggests, we come to acquire such knowledge by gossip or the narration of someone else even without firsthand experience. E.g. knowledge of one's birth date.
- b. **Imagination/ Mere Experience:** this refers to ideas that are confusing, inadequate, and lead only to falsity. We come to acquire such knowledge by means of our sense perceptions. Yes, they directly affect the senses but they remain unclear and uncertain. For they do not reveal the essences of things. Though these ideas from sensory things are useful for our daily life, they do not give any true knowledge. E.g. knowledge of the inevitability of death based on one's experience of the death of others.
- c. **Reason:** this kind of knowledge involves logical deduction. It is a scientific knowledge which involves common notions and adequate ideas of the properties things. Here, the essence of things are inferred from others when we gather resultant effects from their direct causes. In this exercise, the mind rises above immediate and particular things and deal with abstract ideas as it does in the mathematical sciences. Knowledge at this level is considered adequate and true.
- d. **Intuition:** this is the highest degree of knowledge. It involves mathematical truths and first principles or axioms i.e., truths that their denial lead to a self contradiction. For Spinoza, an intuitive knowledge proceeds from an adequate idea of former essence of certain attributes of God to the adequate knowledge of the essence of things. It is the ONLY secure and reliable knowledge for it apprehends the adequate essence of thing without error. It enables us to see things in themselves and in their relations with others. By so doing, we are able to grasp the whole system of nature.

Leibniz

Gottfried Wilhelm Leibniz (1646-1716) is the third great continental rationalist philosopher born in Leipzig, Germany. Four successive schools of philosophy which influenced his education were; Scholasticism, Materialism, Cartesianism, and Spinozism. He later emancipated from these schools and got involved into the 'mathematical materialism' of the day. This accounts for his founding of *Binary Mathematics*, and *Infinitesimal Calculus*. Besides Leibniz academic interest, he was a religious man, a Christian. He wrote extensively in the area of philosophy, of which his main works include the *Monadology*, *New Essay in Human Understanding*, *Essays in Theodicy*, *New System of Nature and the Interaction of Substances*.

Leibniz in his philosophy was occupied with the task of the search for unity and harmony of the whole of reality/universe. Like Galileo, he believed the universe is a harmonious system written in mathematical language by God. This led him to the realisation that basic ideas, like those found in Logic and Mathematics could not be derived by the senses for they are eternal truths. He is essentially a pluralist which is reflected in his metaphysical idea of monads (Monadology) which says that things in nature are a composite/aggregate of simple substances. This would lead him later on to his Epistemology properly.

Theory of Monads

Leibniz discovered that things found in nature are made up of monads. They are basic substances that make up the universe. He states that these monads can be conceived as unextended, immaterial, invisible, indivisible atom-like substances having no quantity, size or shape. Each monad is unique constituting small units of basic elements with which all in the universe is made. Each monad is thus self-contained and windowless i.e., they are independent without any causal relationship with another. They all mirror the universe clearly and distinctively by means of *perception*.

Monadology and Human Knowledge

Having established that monads are windowless having no causal relationship, Leibniz states that one monad always dominates in every collective group of monads. In man, the dominating monad is the human mind. He believes that ideas (monads) are stored up in the mind (the dominating monad) since ideas are simply expressions of the soul i.e., a mirroring or reflection of the mind which is itself a monad. Thus, ideas are in us and are always there whether we think of them or not. Ideas are innate. Our mind, a monad, expresses all essences as well as existences. This goes on to imply that we do not gain any knowledge from the sensory world. All that we know and need to know throughout our existence has been stored up in the mind before birth. The mind being windowless does not allow for any entering of a new knowledge. Our ideas do not come from external senses but inner experience. It is thus for Leibniz, largely misleading, to conceive of the mind as a receptor of new knowledge for nothing can be taught us of which we have not already in our minds. The most which happens to us is a revitalization of latent knowledge in the mind by means of sense perceptions.

Degrees of Knowledge

On first apprehension, Leibniz posits that knowledge is either *clear* or *obscure*. A clear knowledge is one able to be recognized when presented us as against the latter. Clear knowledge is either *distinct* or *confused*. The former is one whose marks can be distinctly separated from another while the properties of the latter cannot be differentiated even though it is recognized. Distinct knowledge is either *adequate* or *inadequate*. An adequate knowledge is that which all its marks/properties are themselves distinctly known while those of the latter are not distinctly known. Adequate knowledge is either *intuitive* or *symbolic*. Intuitive knowledge is a notion which the mind understands distinctly and grasps at the same time all its simple ingredients. Symbolic knowledge occurs when we are unable to contemplate all elements of a complex idea but replace it with signs. For Leibniz, the bulk of human knowledge is only confused or symbolic knowledge. The purest and surest of all degrees of knowledge is the Intuitive Knowledge but is very rare in our daily conceptions. Perfect knowledge for Leibniz is both adequate and intuitive. In his words, “I have defined *idea adeœquata* (a perfect idea) as that which is so distinct that all its ingredients are distinct, and such is nearly the idea of a number.”³⁴⁴

Necessity and Contingency

³⁴⁴ G. W. Leibniz, *New Essays on the Human Understanding* Book II CH. XXXI, trans. Alfred Gideon Langley (New York: The Macmillan Company, 1896), 278.

Leibniz while analysing his view of innate ideas made a distinction between necessity and contingency. A necessary proposition is a proposition that states truth of reason and is analytic, as distinct from a contingent proposition which states truth of fact and is synthetic. For Leibniz, truths of reason are necessary and their contradictory is impossible, while truths of fact are contingent and their contradictory is possible. Where propositions of Mathematics are necessary, those asserting particular existence are contingent. For Leibniz, the necessary is not same as the *à priori*.

Truth of Reason and Truth of Fact

Truth is said to be the correspondence of a proposition with reality, which may be either actual or possible. These propositions show two kinds of truth which are; truth of reason and truth of fact. According to Leibniz, the **law of contradiction** is the sole ultimate premise of all truth of reason, while truth of facts, have as many ultimate premises as there are experiences— they rest on the **principle of sufficient reason**. This accounts for Leibniz’s distinction of knowledge gained by perception, and knowledge gained by reasoning. Classical examples of truths of reason are; two parallel lines never intersect each other, a circle is two semi-circles, an angle of 40 degrees is an acute angle, an axiom is self-evidently true etc. These examples reveal truths of reason which are necessary propositions that are independent of external causes for their existence. Their contradictory is impossible, and they are analytic in nature. At best, they can be referred to as tautologies. Examples of truths of facts are; the snow is white, Socrates is a married man, Marcel is teaching etc. These are not necessary propositions, but they are contingent. When we deny them, there will be no logical contradiction. Thus, their contradictory is possible. They are dependent on external causes for their existence and are synthetic in nature.

Basic Principles in Leibniz’s Analysis of Truth

The two basic principles in Leibniz’s analysis of truth are; the principle of contradiction and the principle of sufficient reason. These principles are based on Leibniz’s concept of innate ideas in acquiring true knowledge. The principle of contradiction (which is also called the principle of identity) states that all necessary (analytic) propositions are true, while the principle of sufficient reason states that contingent propositions may either be true or false, hence, they can only be truth if there is sufficient reason to prove them. When we make existential statements, we have to give sufficient reason to say that they are true. According to Leibniz, all propositions about existence of something are contingent. This is because they state truth of fact. However, Leibniz gave an exception to that of “the existence of God.” He says that the proposition on the existence of God is in itself an embodiment of truth of reason which is a necessary, thus, when it is denied; it would result to a logical contradiction because the very concept of God implies his existence.

15.4 Types of Rationalism

15.4.1 Ethical Rationalism

The views of Kant were presented above as typical of this position. But few moralists have held to ethical rationalism in this simple and sweeping form. Many have held, however, that the main rules of conduct are truths as self-evident as those of logic or mathematics. Lists of such rules were drawn up by Ralph Cudworth (1617–88) and Henry More (1614–87) among the Cambridge Platonists, who were noted for holding that moral principles were intrinsic to reality; later Samuel Clarke (1675–1729) and Richard Price (1723–91), defenders of “natural law” ethics, and the “common sense” moralist Thomas Reid (1710–96) also presented such lists. A 20th-century revision of this rationalism was offered by the intuitionists H.A. Prichard (1871–1947) and Sir David Ross (1877–1971) of Oxford under the name of deontology (from the Greek *deon*, “duty”), which respects duty more than consequences. Ross provides a list of propositions regarding fidelity to promises, reparation for injuries, and other duties, of which he says: “In our confidence that these propositions are true there is involved the same trust in our reason that is involved in our trust in mathematics.” What is taken as self-evident, however, is not specific rules of conduct but *prima facie* duties—the claims that some types of action have on humans because of their nature. If a person is considering whether to repay a debt or to give the money to charity, each act has a self-evident claim on that person, and their comparative strengths must be settled by a rational intuition.

The most-influential variety of 20th-century ethical rationalism was probably the ideal utilitarianism of the British moralists Hastings Rashdall (1858–1924) and G.E. Moore (1873–1958). Both were teleologists (from the Greek *telos*, “end”) inasmuch as they held that what makes an act objectively right is its results (or end) in intrinsic goods or evils. To determine what is right, reason is required in two senses: first, the inference to the consequences is an act of inductive reasoning; second, the judgment that one consequence is intrinsically better than another is *a priori* and self-evident. Moore thought that there is a single rule for all conduct—one should so act as to produce the greatest good—and that this is also a principle self-evident to reason.

15.4.2 Religious Rationalism

Stirrings of religious rationalism were already felt in the Middle Ages regarding the Christian revelation. Thus, the skeptical mind of Peter Abelard (1079–1142) raised doubts by showing in his *Sic et non* (“Yes and No”) many contradictions among beliefs handed down as revealed truths by the Church Fathers. Aquinas, the greatest of the medieval thinkers, was a rationalist in the sense of believing that the larger part of revealed truth was intelligible to and demonstrable by reason, though he thought that a number of dogmas opaque to reason must be accepted on authority alone.

15.4.2.1 Expansion of Religious Rationalism

Religious rationalism did not come into its own, however, until the 16th and 17th centuries, when it took two chief forms: the scientific and the philosophical.

Galileo was a pioneer in astronomy and the founder of modern dynamics. He conceived of nature as governed throughout by laws storable with mathematical precision; the book of nature, he said, is “written in mathematical form.” This notion not only ruled out the occasional appeal to miracle; it also collided with dogmas regarding the permanent structure of the world—in particular with that which viewed the Earth as the motionless centre of the universe. When Galileo’s demonstration that the Earth moves around the Sun was confirmed by the work of Sir Isaac Newton (1642–1727) and others, a battle was won that marked a turning point in the history of rationalism, since it provided a decisive victory in a crucial case of conflict between reason and apparently revealed truth.

The rationalism of Descartes, as already shown, was the outcome of philosophical doubt rather than of scientific inquiry. The self-evidence of the *cogito*, seen by his “natural light,” he made the ideal for all other knowledge. The uneasiness that the church soon felt in the face of such a test was not unfounded, for Descartes was in effect exalting the natural light into the supreme court even in the field of religion. He argued that the guarantee against the possibility that even this natural light might be deceptive lay in the goodness of the Creator. But then to prove this Creator, he had to assume the prior validity of the natural light itself. Logically, therefore, the last word lay with rational insight, not with any outside divine warrant (*see* Cartesian circle). Descartes was inadvertently beginning a Copernican revolution in theology. Before his time, the truths regarded as most certain were those accepted from revelation; afterward these truths were subject to the judgment of human reason, thus breaking the hold of authority on the European mind.

15.4.2.2 Four Waves of Religious Rationalism

The rationalist attitude quickly spread, its advance forming several waves of general interest and influence. The first wave occurred in England in the form of Deism. Deists accepted the existence of God but spurned supernatural revelation. The earliest member of this school, Lord Herbert of Cherbury (1583–1633), held that a just God would not reveal himself to a part of his creation only and that the true religion is thus a universal one, which achieves its knowledge of God through common reason. The Deistic philosopher John Toland (1670–1722), in his *Christianity Not Mystical* (1696), sought to show that “there is nothing in the Gospels contrary to reason, nor above it”; any doctrine that is really above reason would be meaningless to humans. Attacking revelation, the freethinking polemicist Anthony Collins (1676–1729) maintained that the prophecies of the Hebrew Bible (Old Testament) failed of fulfillment; and the religious controversialist Thomas Woolston (1670–1733) urged that the New Testament miracles, as recorded, are incredible. Matthew Tindal (1657–1733), the most learned of the English Deists, argued that the essential part of Christianity is its ethics, which, being clearly apparent to natural reason, leaves revelation superfluous. Thus the Deists, professing for

the most part to be religious themselves, did much to reconcile their public to the free play of ideas in religion.

The second wave of religious rationalism, less moderate in tone and consequences, was French. This wave, reflecting an engagement with the problem of natural evil, involved a decay in the natural theology of Deism such that it merged eventually with the stream that led to materialistic atheism. Its moving spirit was Voltaire (1694–1778), who had been impressed by some of the Deists during a stay in England. Like them, he thought that a rational person would believe in God but not in supernatural inspiration. Hardly a profound philosopher, he was a brilliant journalist, clever and humorous in argument, devastating in satire, and warm in human sympathies. In his *Candide* and in many other writings, he poured irreverent ridicule on the Christian scheme of salvation as incoherent and on the church hierarchy as cruel and oppressive. In these attitudes he had the support of Denis Diderot (1713–84), editor of the most widely read encyclopaedia that had appeared in Europe. The rationalism of these thinkers and their followers, directed against both the religious and the political traditions of their time, did much to prepare the ground for the explosive French Revolution.

The next wave of religious rationalism occurred in Germany under the influence of Hegel, who held that a religious creed is a halfway house on the road to a mature philosophy, the product of a reason that is still under the sway of feeling and imagination. This idea was taken up and applied with learning and acuteness to the origins of Christianity by David Friedrich Strauss (1808–74), who published in 1835, at the age of 27, a remarkable and influential three-volume work, *Das Leben Jesu (The Life of Jesus, Critically Examined)*, 1846). Relying largely on internal inconsistencies in the Synoptic Gospels, Strauss undertook to prove these books to be unacceptable as revelation and unsatisfactory as history. He then sought to show how an imaginative people innocent of either history or science, convinced that a messiah would appear, and deeply moved by a unique moral genius, inevitably wove myths about his birth and death, his miracles, and his divine communings.

Strauss's thought as it affected religion was continued by the philosophical historian Ernest Renan (1823–92) and as it affected philosophy by the humanist Ludwig Feuerbach (1804–72) of the Hegelian left. Renan's *Vie de Jésus* (1863; *Life of Jesus*) did for France what Strauss's book had done for Germany, though the two differed greatly in character. Whereas Strauss's work had been an intellectual exercise in destructive criticism, Renan's was an attempt to reconstruct the mind of Jesus as a wholly human person—a feat of imagination, performed with a disarming admiration and even reverence for its subject and with a felicity of style that gave it a large and lasting audience. Feuerbach's *Wesen des Christentums* (1841; *Essence of Christianity*) applied the myth theory even to belief in the existence of God, holding that “man makes God in his own image.”

The fourth wave occurred in Victorian England, following the publication in 1859 of *Origin of Species* by Charles Darwin (1809–82). This book was taken as a challenge to the authority

of Scripture because there was a clear inconsistency between the Genesis account of creation and the biological account of humans' slow emergence from lower forms of life. The battle raged with bitterness for several decades but died away as the theory of evolution gained more general acceptance.

15.5 Status of Rationalism

15.5.1 Religious

With increasing freedom of thought and wider acceptance of scientific views, rationalism in religion lost its novelty and much of its controversial excitement. To the contemporary mind, it is too obvious to warrant debate that reason and revelation cannot both qualify as sources of ultimate truth, for, were they to conflict, truth itself would become self-contradictory. Hence theologians sought accommodation through new interpretative principles that discern different grades of authenticity within the Scriptures and through new views of religious truth, existential rather than cognitive that turn from propositional dogmas to the explication of lived human existence. Criticism of supernaturalism, however, was still carried on by such societies as the Rationalist Press Association, in Great Britain, and the Humanist Association, in the United States.

15.5.2 Ethical

Rationalism in ethics suffered its share of criticism. Regarding its lists of rules—on the keeping of promises, the return of loaned goods, etc.—it was argued, for example, that if they were specific enough to be useful (as in the rule against lying or stealing), they would tend to have exceptions—which no rule laid down by reason ought to have. On the other hand, if without exceptions, they would often prove to be tautologies: the rule of justice, for example, that one should give all persons their due, would then mean only that one should give them what is justly theirs. After enduring a period of eclipse, however, during which noncognitive theories of ethics (emotive and existential) and relativism had preempted the field, rationalistic views, which agree in holding that moral standards do not depend upon the varying attitudes of persons or peoples, received renewed attention in the mid-twentieth century. Prominent among these developments was the “good-reasons” approach taken by the broadly gauged scholar Stephen Toulmin (1922–2009), the contemporary philosopher Kurt Baier, and others, which examined the contexts of various moral situations and explored the kinds of justification appropriate for each.

15.5.3 Metaphysical

Typical of the ways of reasoning employed by rationalists were two approaches taken to the metaphysical doctrine that all things are connected by internal relations: one a logical, the

other a causal argument. An internal relation is one that could not be removed without affecting the terms themselves between which the relation holds. The logical argument runs: Everything is related to everything else at least by the relation “A is different from B.” But difference is itself an internal relation, since the terms could not remain the same if it were removed. Hence everything is so connected with everything else that it could not be what it is unless they were what they are. The appeal to internal relations played an important part in the philosophies of Hegel, F.H. Bradley, and A.N. Whitehead (1861–1947).

The other line of argument is causal. Every event, it is maintained, is connected with every other, either directly or indirectly. Sir James Jeans (1877–1946), an astrophysicist and popularizer of science, argued that if the law of gravitation is valid, people cannot crook their little fingers without affecting the fixed stars. Here the causal relation is direct. It can also be shown that seemingly unrelated events are joined indirectly through their common connection with some remote historical event, by a chain of events leading back, for example, to Columbus’s landing on the North American continent. But if this had been different, all its consequences would presumably have been different; thus, an indirect and internal relation proves to have been present.

Many rationalists held with Spinoza that the causal relation is really a logical one—that a causal law, if precisely stated, would reveal a connection in which the character of the cause logically necessitates that of its effect; and if this is true, they maintained, the facts and events of the world must thus compose a single rational and intelligible order.

In the twentieth century, such rationalism met with a new and unexpected difficulty presented by quantum mechanics. According to the indeterminacy principle, formulated in 1927 by the German physicist Werner Heisenberg (1901–76), it is impossible to discover with precision both the position and the velocity of a moving electron at the same time. This implies that definite causal laws for the behaviour of these particles can never be attained, but only statistical laws governing the behaviour of immense aggregates of them. Causality, and with it the possibility of rational understanding, seemed to be suspended in the subatomic world. Some interpreters of the new physics, however, notably Max Planck (1858–1947), Albert Einstein (1879–1955), and Bertrand Russell (1872–1970), sustained the hopes of the rationalists by insisting that what was excluded by the indeterminacy principle was not the fact of causality in this realm but only the precise knowledge of it.

Indeed, some leaders of twentieth century science took the new developments in Physics as on the whole supporting rationalism. Protons and electrons, they contended, though beyond the reach of the senses, can still be known, and their behaviour, at least in groups, is increasingly found to conform to mathematical law. In 1932 Jeans said, with a curious echo of Galileo, “the universe appears to have been designed by a pure mathematician.”

15.6 Challenges to Epistemological Rationalism

At first glance, the claim of empiricism that knowledge must come from sense experience seems obvious. How else could one hope to make contact with the world around one? However, rationalism has been sharply challenged—in the nineteenth century by the empiricism of John Stuart Mill (1806–73) and in the twentieth by that of the logical positivists, among other movements. Mill argued that all *a priori* certainties are illusory: Why do people believe, for example, that two straight lines cannot enclose a space? Is it because they see it as logically necessary? No, it is because they have experienced so long and so unbroken a row of instances of it—a new one whenever they see the corner of a table or the bordering rays of a light beam—that they have formed the habit of thinking in this way and are now unable to break it. *A priori* propositions, Mill claimed, are merely empirical statements of very high degree of generality.

This theory has now been abandoned by most empiricists themselves. Its implication that such statements as “ $2 + 2 = 4$ ” are only probably true and may have exceptions has proved quite unconvincing. The rationalists’ rejoinder is that one cannot, no matter how hard one tries, conceive $2 + 2$ as making 5, for its equaling 4 is necessary. But *a priori* knowledge is also universal. Neither of these two characteristics can be accounted for by sense experience. That a crow is black can be perceived, but not that it must be black or that crows will always be black; no run of perceptions, however long, could assure us of such truths. On the other hand, *a priori* truths can be apprehended with certainty—that if a figure, for instance, is a plane triangle within a Euclidean space, its angles must and always will equal two right angles.

One of the most formidable challenges to rationalism came in the twentieth century from such logical positivists as the Oxford empiricist A.J. Ayer (1910–89) and Rudolf Carnap (1891–1970), who had been a central figure in the Vienna Circle, where this movement first arose. Unlike Mill, they accepted *a priori* knowledge as certain; but they laid down a new challenge—the denial of its philosophical importance. *A priori* propositions, they said, are (1) linguistic, (2) conventional, and (3) analytic: They are linguistic statements being primarily of how one proposes to use words. If one says for instance, that “a straight line is the shortest line between two points,” this merely reports one’s definition of “straight” and declares one’s purpose to use it only of the shortest. They are conventional given that as a definition, such statements express a convention to which there are alternatives the statement on straight may be defined in terms of the paths of light rays if one chooses. The statement is analytic in that it merely repeats in its predicate a part or the whole of the subject term and hence tells nothing new; it is not a statement about nature but about meanings only. And since rationalistic systems depend throughout upon statements of this kind, their importance is illusory.

To this clear challenge some leading rationalists have replied as follows: (1) positivists have confused real with verbal definition. A verbal definition does indeed state what a word means; but a real definition states what an object is, and the thought of a straight line is the thought of an

object, not of words. (2) The positivists have confused conventions in thought with conventions in language. One is free to vary the language in which a proposition is expressed but not the proposition itself. Start with the concept of a straight line, and there is no alternative to accepting it as the shortest. (3) Some a priori statements are admittedly analytic, but many are not. In “whatever is coloured is extended,” colour and extension are two different concepts of which the first entails the second but is not identical with it in whole or part. Contemporary rationalists therefore hold that the *apriori* has emerged victorious from the empiricists’ efforts to discredit such knowledge and the positivists’ attempts to trivialize it.

15.7 Major Claims of Rationalism

Rationalism is any view appealing to intellectual and deductive reason (as opposed to sensory experience or any religious teachings) as the source of knowledge or justification. Thus, it holds that some propositions are knowable by us by intuition alone, while others are knowable by being deduced through valid arguments from intuited propositions. Depending on the strength of the belief, this can result in a range of positions from the moderate view that reason has precedence over other ways of acquiring knowledge, to the radical position that reason is the only path to knowledge.

Rationalism relies on the idea that reality has a rational structure in that all aspects of it can be grasped through mathematical and logical principles, and not simply through sensory experience. Rather than being a “*tabula rasa*” to be imprinted with sense data, the mind is structured by, and responds to, mathematical methods of reasoning.

Rationalists adopt at least one of three main claims:

Intuition/Deduction: Some propositions are knowable by us by intuition alone, while others are knowable by being deduced from intuited propositions. Some rationalists take intuition to be infallible, claiming that whatever we intuit must be true; others allow for the possibility of false intuited propositions. Some claim that only mathematics can be knowable by intuition and deduction; some that ethical truths can also be intuited; some more radical rationalists maintain that a whole range of metaphysical claims (like the existence of God, free will and the duality of mind and body) are included within the range of intuition and deduction.

Innate Knowledge: We have knowledge of some truths as part of our innate rational nature. Experiences may trigger a process by which we bring this knowledge to consciousness, but the experiences do not provide us with the knowledge itself, which has in some way been with us all along. Some rationalists claim that we gained this innate knowledge in an earlier existence, some that God provided us with it at creation, and others that it is part of our nature through natural selection.

Innate Concepts: Some of the concepts (as opposed to actual knowledge) we employ are part of our innate rational nature. Some would argue, however, that innate concepts are entailed by innate knowledge, because a particular instance of knowledge can only be innate if the concepts that are contained in the proposition are also innate.

Some rationalists also claim, in addition to the claims above, that the knowledge we gain by intuition and deduction, as well as the ideas and instances of knowledge that are innate to us, are indispensable and could not have been gained through sense experience, and/or that reason is superior to experience as a source of knowledge.

15.8 Distinguishing Rationalism from Empiricism

Rationalism is contrasted with Empiricism, the view that the origin of all knowledge is sense experience and sensory perception. It is usually associated with the introduction of mathematical methods into philosophy during the Age of Reason and the Enlightenment by the major rationalist figures, Descartes, Leibniz and Spinoza. It is commonly referred to as “Continental Rationalism” because it was predominant in the continental schools of Europe, whereas British Empiricism dominated in Britain.

The distinction between Rationalism and Empiricism, however, is perhaps not as clear-cut as is sometimes suggested, and would probably not have even been recognized by the Enlightenment philosophers involved. For example, the three main rationalists were all committed to the importance of empirical science, and in many respects the empiricists were closer to Descartes in their methods and metaphysical theories than were Leibniz and Spinoza. Both Leibniz and Spinoza asserted that, in principle, all knowledge, including scientific knowledge, could be gained through the use of reason alone, though they both observed that this was not possible in practice for human beings, except in specific areas such as mathematics.