

CHAPTER ONE

Presocratic Greek philosophy

The past is not a story; only in retrospect under an interpretation does it unfold as history like a fictional tale in a book. Consequently, in reporting what happened in the past we lack one of the characteristics of a story: a definite beginning. However, in Greece a short time after 600 BC certain changes were taking place in human thought that seemed to have no precedent; and it is on these changes in the way human beings began to think about the world and themselves that the most fundamental aspects of today's Western civilization—its science, ethics, politics, and philosophy—are founded. There were events of significance before this time; but 600 BC onwards marks alterations in human thought sufficient to describe it as a beginning.

The study of ancient philosophy is normally said to extend from 585 BC to AD 529. Of course, philosophical speculation did not cease at that date, but the banning of the teaching of Greek philosophy at the University of Athens by the Roman Christian Emperor Justinian, in AD 529, is thought of as a suitable event to mark a change.

The Presocratic period covers 585 BC to 400 BC and the term "Presocratic" has the obvious literal sense of denoting those philosophers living before Socrates. This meaning is only approximate, as some of the philosophers considered as Presocratics were contemporaries of Socrates who was born in 470 BC and died in 399 BC. Again the decision to divide history in this way is justified by its marking another beginning. A change in direction and style of thought was instigated by Socrates, for knowledge of whom we are almost entirely dependent on Plato (427–347 BC). The labelling of a group of many thinkers, whose work stretched over a period of 185 years, as the Presocratics, can be highly misleading if it is taken to imply a great unity of thought. Nevertheless, comprehension of any one of this group is aided by consideration of the others. Their views were diverse, and their degree of knowledge of the work of others varied greatly.

Considering the enormous claims made for the importance of the Presocratics, it is extraordinary that we have no document dating from that time written by these people. What we know of what they said and wrote comes to us, at best, second-hand, the most substantial contribution being made by Aristotle (384–322 BC), but also a good deal from Simplicius (AD 500–540); and there were many others. Of this derivative information, the most precious is that contained in the “fragments”; this is not actual text that has survived physically down the centuries, but rather all purported direct quotations from the Presocratics. The second source of information is the summaries and comments of those ancient philosophers and historians who did have direct access to Presocratic texts. We must beware of the corruption of Presocratic views by error, misunderstanding, or deliberate point-making.

To understand how these philosophers could have had such an influence on such a wide range of subjects, we have to understand that the early Greeks did not separate out disciplines in the way we do now. “Philosophy” literally means “love of wisdom”, and the topics that fell under this name covered what we now pick out as philosophy, logic, science, medicine, ethics, social science, psychology, and religion. The importance of the Presocratic philosophers, particularly the earlier ones, is to be found in their speculations in physics—the study of nature—for it is among these early tentative attempts to provide a complete, simple, unified explanation of the various phenomena of the world, or universe, that the outline of the methods and concepts of modern empirical science were first drawn. From a dissatisfaction with mythical accounts of the world explanations began to emerge that were generalizable and systematic rather than *ad hoc*, naturalistic rather than having recourse to supernatural gods and powers, and that were, most importantly, backed by arguments open to inspection, instead of assertions based on authority or mere durability—although the distinctions between the mythical and the new forms of explanation were not always sharp. The Presocratic philosophers were *phusikoi* (from which comes the word “physics”); speculators on the workings of nature.

It is necessary first to say something about the world in which they lived. Philosophy began not on mainland Greece, still less in Athens where it was later to flourish, but in Ionia—the western seaboard on the Aegean Sea of what is now Turkey, more generally called Asia Minor. Mycenaean civilization developed in mainland Greece between 1580 BC and 1120 BC under the considerable influence of the more ancient Minoan civilization (3000–1000 BC) of Crete. After the collapse of the Mycenaean civilization, Greeks from the mainland after 1000 BC began colonizing the islands of the Aegean, and the west coast of Asia Minor, which became known as Ionia owing to the Ionic form of the Greek language spoken there. The Greeks of the sixth century BC

looked back upon the Mycenaean period with nostalgia; the essential features of their myths and religion, told for example through the poems of Homer, were taken from the Mycenaean. Around 700 BC the Ionians flourished with trade increasing around the Mediterranean. Various peoples influenced the cultural and intellectual growth of Ionia. From the Scythians in the north they received shamanistic beliefs that probably influenced Pythagoras. Other peoples to exert influence on Greek culture were the Lydians and Phrygians in Asia Minor, the Canaanites and Phoenicians—the latter providing the Greeks with the tremendously important matter of an alphabet. Egypt was also a country that fascinated the Greeks, and the effect can be seen in what the Greeks took from Egyptian mathematics and medicine. Perhaps the most significant influence was derived from the Babylonian Empire (which fell to the Persians in 538 BC) where major advances had been made in mathematics and the data collected on astronomical events. The Iranian peoples (which included the Persians) had military domination of Asia Minor by 540 BC.

Against this background Greek city-states began to crystallize out, first on the mainland, then spreading to Ionia by the 7th century BC. The change is significant because it created a sympathetic environment for philosophical thinking and science. The city-states were ruled by oligarchies, but oligarchies which had come to power with the consent, and remained under the influence, of a significant proportion of the population. Although certainly not democracies—since the group with a say excluded women, slaves, and the poor—these states did at least embody some kind of stability through a law invested with some legitimacy through consent, replacing the arbitrary and volatile power of the absolute despot. A relatively stable and increasingly prosperous environment, and an alphabet, were opportune conditions for the rise of scientific and philosophical speculation.

The concerns of Greek philosophy centred on perplexing problems derived from common observation and nascent science: the one (unity) and the many (plurality), permanence and change, reality and appearance, existence (being) and non-existence (non-being). We observe a world of many things over which we require a sense of its unity into one world; we observe also a world of change and movement beyond which we require a sense of its essential stability. Under the heading of permanence and change comes the search for something stable behind the restless world as it appears; something that would either explain the apparent world, or declare it ultimately illusory. We also observe a world containing a plurality of objects; behind this there must be something that binds this diversity into one permanent unified cosmos. Without such a “something”, we lack an overall and ultimate explanation for the world. The Greek word *kosmos* (from which we derive “cosmos”) implies a universe which is ordered and beautiful in arrangement, and therefore in principle capable of explanation.

Much of Greek philosophy is an attempt to discern underlying similarity between apparently diverse phenomena, which can act as a common explanation of the apparently different phenomena. Similarity is emphasized rather than difference. Thus an explanation of why two differing phenomena occur might be derived from some underlying factor beyond the features by which they differ. This simplifies by eliminating the need for special explanations applicable only to each phenomenon. This approach is one of the foundations of modern science. To use an example from modern science: the way in which, after being dropped from a plane, the phenomena of the falling of a cow and of a hammer are explained does not require two special explanations one applicable only to cows and the other only to hammers, rather the two apparently diverse phenomena are united under the common underlying reality that they are both physical bodies.

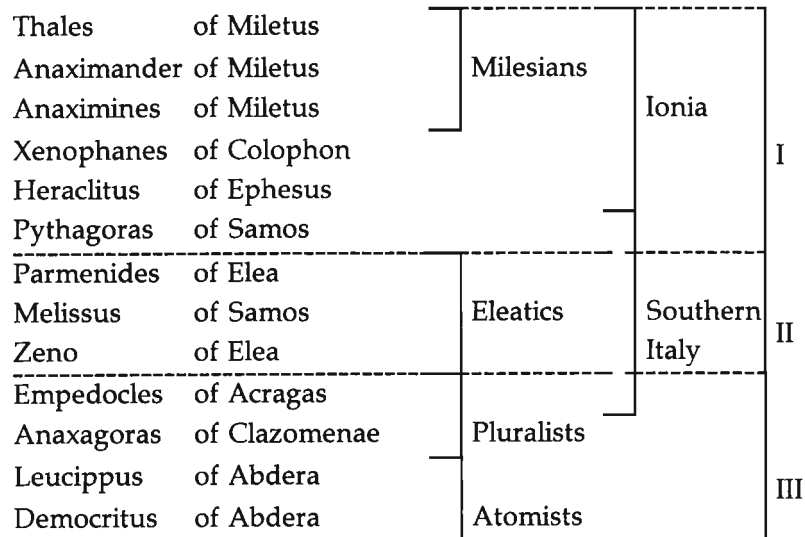
There are various possibilities that ensue from the attempt to provide a unified explanation of the phenomena of the universe in the face of its apparent diversity:

- (a) To give an account of some material stuff or substance which underlies, and can perhaps be used to explain, all the apparent variety.
- (b) To give an account of some universal controlling law which brings unity to the plurality of the apparent world.
- (c) To assert that the world as it appears is an illusion because to be really as it appears would be inherently contradictory, and to deduce that the real world must be quite other than it appears.
- (d) To be sceptical about our ability to provide a unifying explanation for the world.

In the Presocratics all these possibilities—which are not of course mutually exclusive—are considered.

Among the philosophers called Presocratics there are some minor figures who will not be discussed. Some Presocratics probably wrote nothing. Of the ones who did write, the amount of evidence we have as to what they said varies greatly. Unsurprisingly, although there are difficulties of interpretation in all cases, some are more difficult than others.

It will be useful first to present a list of the most significant Presocratics in the rough order in which they are usually considered and to display the three main phases of Presocratic thought (opposite: I= pre-Parmenidean, II=Parmenidean, III=post-Parmenidean). Any attempt to categorize groups of Presocratic philosophers is more or less arbitrary; the categories must emphasize similarities at the expense of differences. The Milesians sit quite well together as a group; although, as will be seen, Anaximander produces sufficiently



unusual views to make us doubt this grouping. Melissus is included among the Eleatics, although he did not come from Elea, because of his general approach and because he was probably a pupil of Parmenides. It is customary to divide these philosophers into those from Ionia and those from the Greek colonies of southern Italy and Sicily. Pythagoras, who was born in Ionia, comes under southern Italy because of his work and influence in that area.

The customary division of Presocratic philosophy into three phases, as above, is one of which the philosophers themselves would not have been conscious. The first phase (I) indicates (with the exception of Xenophanes) an optimism in the power of empirical explanation; the second (II) denotes a period of the ascendancy of pure reason, separated from empirical explanation and evidence; the third phase (III) can be understood as an attempt to reconcile phases (I) and (II).

Let us now look at the Presocratics in the light of the four approaches, (a), (b), (c), (d), given above, as possible replies which ensue from asking the central early Greek question: how to explain, or reconcile, the permanence (one, unity, being) required for a unifying explanation of the universe, with the appearance of constant change (many, plurality, becoming). Under this notion we find the following groupings:

- (a) Thales, Anaximander, Anaximenes, Empedocles, Leucippus, Democritus
- (b) Heraclitus, Anaxagoras, Pythagoras
- (c) Parmenides, Melissus, Zeno
- (d) Xenophanes

To a great extent the guide to putting a particular philosopher in a certain group is merely a matter of emphasis. Plainly those in (a), say,

have not only to be concerned with the basic stuff of the universe, but also with the forces that control it, as in (b).

Pre-Parmenidean philosophers

The concept linking the Milesians is that of *arche*. *Arche* is an explanatory concept introduced to understand the Presocratics by Aristotle; it denotes the original and controlling stuff and first principle of the universe, the nature of which provides an explanation of the existing universe, and its origin, as a whole.

Very little is known of the first philosopher-scientist Thales. His chief subject for explanation is the energy of the universe. One answer to this is hylozoism: a view whereby everything in the universe is to some degree animate. This does not mean that stones are conscious, and subject to pain and desire; all-pervasive life is a matter of wide degree. Movement is one of the most powerful intuitive criteria for life, and Thales noticed that magnets were capable of both being moved and moving certain other objects. In the case of Thales the *arche* was water, and seems for Thales to have been self-moving. That water should have been the *arche* need not surprise us greatly since we can immediately reflect upon its life-sustaining properties, and that, when dried out, things die. This provides an explanation for the cosmos which dispenses with the need for *ad hoc* divine intervention; it is this that marks an important step towards rational science. But we should not think that such a view necessarily involves atheism. Indeed, Thales believed that the world as a whole is pervaded with a divine life-force; this accounts for the change and variety of the world. Thales also held the view that the earth floats on a bed of water.

The second, and the most interesting, of the Milesians is Anaximander. Anaximander's *arche* is not any ordinary material stuff, but what he called *apeiron*: the infinite or indefinite. *Apeiron* is a substance and principle of infinite extent and indefinite character; because it explains all the universe it is unlimited in extent, and since from it are evolved all qualities of things, the *apeiron* itself has no qualities. *Apeiron* is neither hot nor cold, wet nor dry; it is qualitatively neutral. The world as we know it is evolved from the entirely homogeneous continuum of *apeiron* by a temporary local imbalance in opposing elements of the *apeiron*; and this passing away and coming to be of worlds is cyclical. Features of the world from the original state are produced by a process of "winnowing out", or shaking, with like qualities gathering with like; this may involve a doctrine of eternal motion. The controlling principle is a form of cosmic justice, whereby if one quality gains dominance there has to be recompense for this by an increase in the opposite quality. The

obvious problem surrounding an explanation from imbalance in *apeiron*, is why any kind of imbalance should begin, given its once homogeneous state.

Anaximander held the view that the earth does not move and is cylindrical in shape. The doctrine of an immobile earth was to remain a powerful force in Western cosmology until the time of Copernicus (1473–1543) and Galileo (1564–1642). The reason for supposing that the earth was motionless was based on the equality of forces to which it is subject in its situation equidistant from the edges of the universe.

One of the most interesting aspects of Anaximander is his view on biology and the origins of life, for here he held that life was derived from the action of the sun on moist things, whereby fish developed, and within fish adult humans were originally formed who appeared when the fish form was shed.

Anaximenes, the last of the Milesian philosophers, presents a less bold doctrine of *arche* than Anaximander, for while the *arche* is infinite, Anaximenes returns to a physical substance: air. Air is in constant motion as can be felt, but not seen, from the wind. By a process of rarefaction and condensation air becomes visible in the forms we recognize as fire (rarefaction) and water and stone (condensation); through this process an account is given of how things change. The earth is flat and rides on air, and it is surrounded by heavenly bodies, all of which are centres of fire, but most are so distant from earth that they provide no heat.

With Pythagoras we move to a different phase in Greek philosophy. In the case of Pythagoras it is even more difficult than usual to disentangle those doctrines actually originating with him from those attributed to him by the school of Pythagoreans which appeared later in southern Italy. Pythagoreanism is what is more important to us from the aspect of a philosophical study.

Pythagoras, and those who called themselves his followers, fostered a secret society who kept the doctrines of "The Master" Pythagoras unrevealed, and also formed a political movement; this, and the deliberately exaggerated legend woven around Pythagoras, to the extent of the attribution of magical powers, aroused the suspicion and derision of contemporary thinkers such as Heraclitus, Xenophanes, and the historian Herodotus. The Pythagorean sect seems to have been more concerned with embodying a way of life than encouraging free inquiry. Nevertheless Pythagoras was a brilliant polymath.

The attribution to Pythagoras, or his followers, of significant contributions to mathematics and geometry, including Pythagoras' Theorem, is a matter of dispute among scholars. The activity of Pythagoreans seemed to centre on an obsession with numbers, which derived from a realization that mathematics in the form of expressions in numbers and ratios (proportion) held the key to understanding many disparate aspects of the world, such as musical harmony and

architectural proportion. Thus pitch in a stringed instrument may be expressed in numbers as a proportion of total string length. In fact there seems to be an indication that Pythagoreanism did not see numbers merely as a means to an explanation of the world, but thought of the world *as* number in some sense. The identification of numbers and objects may have arisen from the association of numbers with spatial configurations; the number one is a single point in space from which other shapes are built up. If the number one is a point, then it is a short step to identifying the number one with a material point from which material objects are constructed by successive addition. The number one is the point, number two the line, number three the surface, number four the solid. An important Pythagorean doctrine is that a line, or any object with magnitude, is infinitely divisible, and constructed out of an unlimited number of infinitely small magnitudes. The Pythagoreans also asserted the existence of the void and infinite space.

The central importance of the Pythagoreans is that they saw the essence, or real identity, of a thing as determined not by the stuff of which it is made, but by its structure. One only has to think of cases of the same type of object according to structure, made from different stuff, to grasp a crude idea of the thinking here. The doctrine concerned with numbers and structure was deeply influential on Plato's thinking on the Forms, and on Aristotle's identification of substantial individuals with matter plus form or structure. For the Pythagoreans the structure was determined by the numerical concept of ratio or proportion. It has been suggested that Pythagoreanism indirectly encouraged, even if it did not found, the generation of pure, abstract mathematics and geometry from its pragmatic origins in Babylonia.

A major doctrine we can attribute to Pythagoras concerns the soul and its transmigration. The soul is an immortal unity and can be incarnated and reincarnated in a variety of living creatures; whether the soul appears in a creature that is lowly or not is determined by the spiritual purity of the life of that soul in a previous incarnation. Since everything contains soul, this lent itself to an asceticism which involved vegetarianism. The cosmological and moral doctrines were conceived as connected; they were drawn up as displaying the opposing values of the limited (associated with odd numbers) and the unlimited (associated with even numbers)—the former denoted the structured and quantitatively measurable (good), and the latter the chaotic and irrational (bad). The view was also taken that the world went through eternal cycles of recurrence. The Pythagoreans seem to have been the first to suggest that the earth is spherical.

Xenophanes made his contribution to philosophy through poetry, as did Parmenides and Empedocles, although unlike Xenophanes they tended to use poetry merely as a vehicle for expressing their ideas;

Xenophanes was primarily a poet. He was undoubtedly aware of the teachings of Pythagoras, as well as the Milesians. His chief interests were not with nature directly, but with theology and questions about the limits of human knowledge. He criticized the traditional polytheism of Homer, mocking as absurd the unwarranted portrayal of gods in the human image; horses would, if they could, no doubt draw gods like horses. He opposed this view to a rational theology of impersonal monotheism which may have been pantheistic. Although he was probably not an absolute sceptic about knowledge, he did indicate that, while opinion should be granted, the term "knowledge" should be withheld from the total cosmic explanations of the Milesians.

Heraclitus is a figure who stimulates great interest partly because his oracular pronouncements respond flexibly to a variety of interpretations. It is possible to see the conscious influence of Heraclitus' ideas and manner of expression in Hegel (1770–1831) and Nietzsche (1844–1900), although one must be cautious of foisting on thinkers anachronistic interpretation. However, even to his contemporaries Heraclitus had a reputation for obscurity partly because of the oblique rhetorical way he expressed his thought, and partly because of his deliberate eschewal of manifest systematization. For this reason, as well as the usual problems surrounding the study of the Presocratics, a wide variety of interpretations has emerged.

His views suggest an aristocratic contempt for the opinions of other philosophers and the common man. His method of presenting his ideas reflects his belief that the mode of expression needs to fit the deep riddle of the world. Again we see the central problem as that of reconciling change and constancy. Heraclitus adopts the Milesian procedure of identifying an *arche*: fire. Knowledge can be obtained only by combining the information provided by the senses with the discipline of reason. Heraclitus' famous view is that everything is in flux; everything is a process; there is no being, only becoming. But then the problem is to identify a concept of order in this constant change. Heraclitus chooses fire as *arche*; here we have something that is in flux while maintaining its identity; the problem of stability amidst change in this case is solved in so far as the fire is kindled and extinguished in equal measure. This gives the appearance of stability. Air, water, and earth emerge in that order away from likeness to fire through the local quenching of the world-fire.

Things come to be and pass away under the influence of a tension of opposites; if some quality exists, then so must its opposite. The only factor in the world order not subject to change is the *logos*, an objective overall controlling force on the processes which determine the nature of the world, which can be known only to the limited extent to which our soul is part of the divine *logos*. To the extent to which our souls are more spiritual (fiery) and less affected by bodily

moisture, we gain understanding of the cosmic *logos*. Sometimes Heraclitus speaks of the *logos* in the abstract terms of a controlling law of measure and proportion, at others it is apparently identified with the cosmic fire.

A striking metaphor is presented by the bow and lyre: a bow, for example, is apparently stable, while it is maintained in its constant state by the equal proportion of opposite forces; the tension of the wood of the bow opposes the equal tension of the string, resulting in a static tension. In another example he points out that we cannot step in the same river twice since the water is in constant flow, nevertheless we identify it as the same river; the being of the river is maintained in its becoming. The *logos* refers to a rational law whereby the existence of a thing is maintained by the strife of pairs of opposites of equal measure to form a harmony or unity. The cosmos is also a unity despite appearances. Indeed, Heraclitus goes further in maintaining an identity of opposites, citing examples like day and night where a thing can convert to its opposite and back again; the process is an *unbroken* circle. God enters Heraclitus' cosmology as embodying all opposites, and as the fire which is the reality behind appearances acting on the world in accordance with the *logos*, which maintains an equal proportion of opposites, so producing all things.

Parmenidean philosophers

With the Eleatic group of philosophers we reach a dramatic change in outlook and method. The Eleatics reveal problems by a process of pure deductive reasoning that threatens to show that the progress made by empirical investigation into nature must be illusory; the world as it appears cannot be real for it is riddled with intrinsic contradictions. The Eleatic conclusions are supported by appeal to reasoned logical argument rather than sensory evidence. By dwelling on the concept of existence as such, deductions by reason show that the world in the form that it appears cannot really exist for it involves factors which contradict deductions from the concept of existence; and where reason and experience contradict each other, reason must oust experience.

With Eleatic philosophers we see the clear emergence of an opposition that persists down through the whole of the subsequent history of philosophy: whether pure reason or the senses reveal most accurately the true nature of reality. There are those rationalists for whom the world as it really is is discovered not by the senses but by reason; the real nature of the world is determined by processes of pure deductive reasoning, and if that view of the world clashes with what is presented by the senses, then what is presented by the senses must be discounted as mere appearance in favour of the world as it really is

according to reason. In contrast, for the empiricists only the senses can determine the true nature of the world, if it can be determined at all, and the other supposed true reality of the rationalist, which is likely to be radically different from the world as it appears, will generally be regarded as illusion.

Parmenides was a pupil of Xenophanes, and influenced by Pythagoras; some of what he says sounds like a direct attack on the doctrine of all-pervading becoming found in Heraclitus. The work of Parmenides is divided into two parts: the "Way of Truth", and the "Way of Seeming". The second part, the "Way of Seeming", provides speculations on nature in the usual Ionian manner. Yet he seems to have taken this second part as merely a pragmatic addition, which is ultimately false, to the truth about the world given in the first part. The "Way of Seeming" is false, but has pragmatic value in being designed for dealing with the world as it seems, in contrast with the truth about the world given in the "Way of Truth".

Parmenides' argument proceeds from the premise that "It is": that something exists. The only two alternatives to this are posed: (a) to deny "It is" and assert that there is nothing—this view has had no defenders, and (b) to assert both "It is" and "It is not". The exhaustive choice is between "It is" and "It is not". Non-existence ("It is not") is meaningless, for then we are committed to saying of "It" both that "It is" and that "It is not" which, being a self-contradiction, cannot be formulated as a thought. What cannot be thought cannot exist, and what "is not" cannot enter our thoughts, therefore the existence of non-existence is impossible, being self-contradictory. For something to be thought of and spoken of (recognized) it must exist; it is not possible to speak or think of what is not there—a nothing. Thus what exists, despite the deliverances of our senses, must always have existed as a continuous, unchanging, timeless, indivisible unity. Change and diversity involve the positing of "It is not"—nothing (non-existence) existing—which is contradictory and so impossible.

This view reconciles the problem of the one and the many by demonstrating that the appearance of many is impossible as a reality; permanence is also reconciled with change by denying change. Thus what is is one and cannot change. Coming to be and passing away are impossible. Change and plurality involve becoming; a process from something that is, to something else that is, involves a something becoming a nothing, and a nothing becoming a something; but nothing cannot exist and something cannot come from nothing; and if something comes from something, then what is must already always have existed. Therefore all change and plurality are impossible; apparent change and plurality presented to our senses are an illusion. There is no void (vacuum), just unbroken existence (plenum) that does not admit of degrees, in which, obviously, movement is impossible; a

void would mean non-being, which means non-existence, but non-being cannot be (exist). Reality is totally immobile. There is no *kosmos* for Parmenides, for *kosmos* implies structure, and in a true plenum there can be no structure.

The influence of Parmenides can hardly be overestimated; through the respect held for him by Plato he came to affect the course of Western philosophy. (The denial of a void is still found in Descartes (1596–1650)). From Parmenides grew the Platonic metaphysical and epistemological doctrine that what can be known must be real, and what is real, eternal and unchanging cannot be the unstable world given by experience. There must be objects of knowledge to match the immutable status of knowledge proper. From this grew scepticism of empirical knowledge, so that knowledge is taken to apply truly only to mathematics, geometry, and deductive reasoning.

Melissus was a follower of Parmenides and produced some further arguments supporting the absolutely unitary nature of reality as described by Parmenides. His only serious disagreement involved saying that reality must be infinite in space as well as infinite in time. For the question could be raised as to what lay beyond the finite sphere of Parmenidean reality. Parmenides took reality to be a finite sphere because of the necessity for perfection and completeness. It has been suggested that the finitude of Parmenidean reality is such as to rule out the sense of the question "What lies outside the sphere?". But this was not to be understood until the conflicting conceptions of space proposed by Newton (1642–1727) and Einstein (1879–1955)—in particular whether space was Euclidean or non-Euclidean—reached some kind of resolution.

Further support for Parmenides came from Zeno. There is good evidence from Plato to suggest that both Parmenides and Zeno met Socrates. Zeno's deductive arguments produce absurd conclusions derived from taking the world of apparent plurality (divisible), change and motion as real; the only alternative must be that reality is a Parmenidean changeless unity. The apparent world cannot be the real world because analysis of the consequences of its features, if supposed as real, leads to paradox, contradiction and absurdity. There is also an opinion that a target for Zeno's attacks was the Pythagorean thesis that things with magnitude consist of a plurality of infinitesimal magnitudes.

The arguments of Zeno divide into two parts: (a) The paradoxes of plurality, (b) The paradoxes of motion. Each time Zeno's aim in the arguments is to elicit a contradiction from the necessary conditions for plurality and motion. He uses a variety of arguments which have the general form that, from some proposition p about apparent reality, both q and then not- q are deduced, which reveals the absurdity of p , supposing p to be real.

(a) The paradoxes of plurality

- (1) Limb (i): If there are many things, then things are infinitely small—things have no magnitude.
 Limb (ii): If there are many things, then things are infinitely large—things have unlimited magnitude.
 Limb (i): If there are many things, there must be a definite number of things. Otherwise all distinction between one and many is lost. If the number of things is definite, there must be some ultimate parts which are indivisible. If they are indivisible, they cannot have size, for size implies divisibility. Everything is therefore made up of parts with no magnitude. But then no matter how many—even an infinite number—of the infinitely small parts are summed together, they must still add up to something infinitely small.
 Limb (ii): What exists must have size. Something with size can be added to, or subtracted from, something else; something that could not add to or subtract from something else would be nothing. Whatever has size must be divisible; and whatever is divisible once must be made up of parts that are always divisible; each part, no matter how small, must have some size, and hence be divisible. Everything is made up of an infinite number of parts, all with some magnitude, therefore everything must be infinitely large.
- (2) Limb (i): If there are many things, then they must be finite in number.
 Limb (ii): If there are many things, then they must be infinite in number.
 Limb (i): If there are many things, they must be countable, for there must be some number that is exactly how many things there are; no more and no less. Then the number of things must be finite or limited in number.
 Limb (ii): If there are many things, then they must be separate. Between any juxtaposed but separate items, no matter how close they are, there must be another item; but then there must be some item separating that item, and so on *ad infinitum*. So the number of things must be unlimited.
- (3) One further argument is worth mentioning. If the small grains or parts of millet make no noise when dropped on the ground, how can it be the case that when the sum of these, a bushel of millet, is dropped, it does make a sound?

(b) The paradoxes of motion

- (1) Motion is impossible because to traverse any distance it is first necessary to travel half the distance; but before that it is necessary

to travel half of half the distance. Since there is an infinite number of such subdivisions in any distance, it is not possible to traverse any distance, or even take the first step.

- (2) Achilles and the Tortoise. In a race, despite Achilles being the quicker runner, if he gives the Tortoise any head-start at all, he can never overtake, or even catch up with, the Tortoise. For no matter how fast Achilles runs, by the time Achilles reaches the point where the Tortoise was when Achilles set out, the Tortoise will always have moved on. Achilles would have to pass through an infinite number of points where the Tortoise was before catching the Tortoise, which is impossible.
- (3) The flying arrow. An arrow in flight is also stationary, for at any instance it occupies a definite position by filling a volume of space equal to itself.
- (4) The stadium. In a stadium there are three rows of men who first stand next to one another, first in one position, then in another position.

Position 1
 $A_1 A_2 A_3 A_4$
 $B_1 B_2 B_3 B_4 \rightarrow$
 $\leftarrow C_1 C_2 C_3 C_4$

Position 2
 $A_1 A_2 A_3 A_4$
 $B_1 B_2 B_3 B_4$
 $C_1 C_2 C_3 C_4$

Row *A* is stationary while row *B* and row *C* move simultaneously in opposite directions at the same velocity. B_4 passes A_3 to reach A_4 in the same time as it takes B_4 to pass C_1, C_2, C_3 , and reach C_4 . But bodies travelling at the same velocity must take the same time to pass the same number of bodies of the same size. Here twice the distance was covered in the same time as half the distance. Or alternatively, half of a given time is equal to the whole of that time.

These arguments are meant to support Parmenides' thesis that the world is one and full—a plenum—and therefore incapable of division, motion, or change. This leaves the senses as a source only of illusion and falsehood, since the world as it seems to be according to the senses is impossible and so cannot be real.

Only a few brief remarks can be made on the replies to Zeno's arguments. Some mathematicians and logicians have thought Zeno's arguments of great subtlety, with the solutions forthcoming only with the invention of calculus. Aristotle thought some of the fallacies easy

to spot, saying that in the case of the stadium row *A* is stationary, so that rows *B* and *C* move with twice the relative velocity to each other as compared to rows *B* with *A*, or *C* with *A*. Others have thought Aristotle's reply unsatisfactory. Still further problems are created if the change from the two positions is instantaneous, for then there is no time in which the extra men can be passed; this may lead us to conclude that time cannot consist of indivisible instances. It has been pointed out, in reply to the Achilles and the Tortoise case, and similar arguments, that an infinite series such as $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$ has the finite sum 1. This too is thought to be a mistaken reply by some: since the first step can never be taken, the series can never begin.

The intellectual situation in Presocratic philosophy now stood like this, (a) One could accept the views of the Eleatics and give up the attempt to explain the world as revealed by the senses; (b) one could accept the Eleatic view, but try to reconcile it with traditional Ionian empirical explanation and knowledge of the world (Empedocles, Anaxagoras, Leucippus, Democritus); (c) one could accept the Eleatic position but take the view that, although we can have *knowledge* only of a world behind and other than appearances, we can have opinion about the world of appearances, and that world is not a mere nothing; at the same time major concern would shift, with Socrates and Plato, from the investigation of nature to that of ethics, meaning, and epistemology.

Post-Parmenidean philosophers

Taking up the challenge of Parmenides to give some place to the world as it appears in reality is the remarkable figure of Empedocles. His surviving work consists of two poems, *On nature* and *Purifications*. Roughly, the first deals with science, and the second with myth and soul; but the distinction is not clear-cut intellectually nor certain in the assignment of certain passages to one poem or the other. The poems are a flawed union of reason, represented to the Greeks by Apollo, with the mystical vision of Dionysus.

Empedocles accepts the Parmenidean view that the world is a plenum, that there is no void, and that nothing in the world could really come into being or be destroyed. But he still maintains that change is possible within the essential imperishable "all" of the universe; the basic substance of the cosmos is immutable, but change occurs through the various interminglings (mixtures) within the plenum. The limitless cosmos is not a unity but a variously mixed plurality of imperishable elements. The Presocratic problem of the one and the many is circumvented by establishing many (four) Parmenidean "ones" in the reality underlying the appearance of many.

Knowledge through the use of the senses is possible if they are used properly. The basic stuff of the world is four "roots" or elements: earth, water, air, fire. These four *archai* are equal and immutable. They mix to create all that there is by the virtue of the opposing forces of Love and Strife. It must be recognized that the cosmos is seen as organic; Empedocles adopts a form of hylozoism, that is, all things are to some degree endowed with life. Love and Strife are active forces within the world which elicit change from things.

The world is adjusted according to the relative dominance of the principles of Love or Strife (attraction and repulsion); this applies both to local areas of the cosmos and to the cosmos as a whole. Within the universe as a whole the process operates in great cyclical epochs. When Love is dominant either locally or globally there is progression towards order and a harmonious blending of the basic elements; when Strife is dominant there is progression towards dissonance of the elements and separation. Strife attracts like to like, thus pulling the mixed elements apart by pulling like elements together; Love attracts unlike to unlike, thus pulling the dissimilar elements together. Within the cosmos where Strife is in overall dominance it is possible to find local areas of harmonious Love, and the reverse is also the case. Empedocles in fact believed he lived in a period of increasing overall Strife.

The development of the world proceeds in four stages in a never-ending cycle; it is therefore incorrect to say the cycle starts anywhere. To begin somewhere: in the first stage Love rules, and the world is a homogeneous sphere of fully blended unlike elements; in the second stage there is a movement from the rule of Love towards that of Strife, during which time the elements begin to separate out like to like; in the third stage Strife rules and the four elements are in separate masses; in the fourth stage the rule of Love begins to gain over Strife and the elements begin to coalesce or fuse unlike to unlike. The cycle is thus completed. Our world is in fact stage two. For the sake of the coherence of this view it is perhaps necessary to admit the first and fourth stages as only momentary watersheds; without this it is impossible to see what could be the engine of change producing destabilization at these times.

There is a biological counterpart to this development which occurs during the transitions between the absolute rule of Love and that of Strife and back again. During the time of Love increasing over Strife, disunited limbs are formed which are gradually brought together by Love, but in monstrous forms. During the time of Strife gaining over Love, "whole-natured forms" arise which are undifferentiated by sex as is the case with plants; this leads on to our own stage where there is differentiation by sex and there is great variety of animate life.

Particularly obvious in the first parts of this evolution is the elimination of unviable life forms which are unable either to nurture or to reproduce themselves.

Empedocles explains sensation as a physical interaction. In vision, particles emitted (effluences) from objects fit or fail to fit pores of a certain shape in the eye; this allows the interaction between the element entering the sense organ and the same element within us required for perception. This also accounts for chemical interactions; for example the failure to mix of oil and water. Perception is effected by the balance of elements within the faculty of cognition—like perceiving like. Thought is physical; men think with the blood, and thought is upset by changes in the elements constituting it.

In the *Purifications* the mythical story of man presented by Empedocles is that of the Fall: men are fallen from a higher state of bliss and a golden age when Love was stronger, and the spirit wanders in exile clothed in different physical forms—plants, animals, humans—journeying from a lowly state towards the gods. The soul (*psyche*—distinguishing animate from inanimate) is a microcosm, some combination of the four basic elements. The spirit (*daimon*) is a further divine non-physical element by which we approach the gods. Empedocles gives an account of human biology, including reproduction, in some detail.

With Anaxagoras we also find a philosopher who accepts the Eleatic argument for the absolute conservation of being (no non-being) in reality, but for whom, nevertheless, motion and change are possible. Anaxagoras adopts the interesting thesis that there are no particular basic elements, but that there is an unlimited number of eternal stuffs. The multitudinous stuffs of the world were originally combined in one completely mixed mass, which separated out once and for all under the motive force of the cosmos, Mind (*Nous*: Intellect), which is non-material and infinite. Mind sets things in order, and is the only thing separated out from the stuffs of the world. At the beginning of the cosmos Mind starts the separation out of stuffs by initiating rapid cosmic rotation, causing the cosmos to grow in size; from then on mechanical causation controls change except where Mind animates living things. Heavier stuffs collect at the centre of the vortex, lighter stuffs tend toward the outer edge. The general process accords with the Ionian tradition. Since every stuff and quality were in the original mix, it is not necessary in explaining the world to contradict the Parmenidean principle prohibiting creation or destruction of what is.

The senses are misleading as to the true nature of the world; knowledge is possible only through the understanding contributed by Mind.

Matter is infinitely divisible; a further interesting twist to this thesis is that every stuff contains a mix of *all* stuffs. One of the stuffs

is predominant, which gives things their particular character; thus "gold" names that stuff in which gold is predominant. But there can be no pure stuffs. Change occurs when the predominant stuff alters in the remixing of stuffs. The world is built from "seeds" of qualitatively determinate imperceptible stuff, which are not, however, indivisible, and of course themselves still contain a portion of every other stuff.

The combination of an unlimited number of stuffs of unlimited divisibility stands as a direct denial of the conclusions of Zeno; but this does not involve the absurdity of supposing either the unlimited size or unlimited smallness of everything. A thing with an unlimited number of possible divisions always has elements of a determinate size, and can have a finite magnitude.

Leucippus and Democritus are usually considered together because we know almost nothing about Leucippus, although from one remaining fragment we gather that he espoused atomism and may even have been its originator. There is a considerable amount of information on the atomists. The atomic conception of the world as consisting of ultimate indivisible and indestructible particles moving in a void has appeared at intervals repeatedly until the beginning of the twentieth century. So the importance of the Presocratic atomists is immense.

The atomists set out to reconcile an explanation of the empirical world with the arguments of the Eleatics banning the positing of the real destruction or creation of being, or the reality of change and motion. So every atom has Parmenidean being and moves in the void (nothingness). The atomists' conception is the exact opposite of Anaxagoras' and is the genesis of the contrast between explanations which are teleological (purposive) and those which are mechanistic, involving the distinction of primary and secondary qualities. In atomism, ultimate atomic constituents have no intrinsic qualities except size, shape and motion, and they are not divisible. The ultimate constituents are a-tomic: literally cannot be cut. We move from Anaxagoras' world, brimfull of colour, heat, sound, taste, to a world which is in its ultimate real constituents not even grey, but colourless; only derivatively are the "subjective" qualities such as colour experienced owing to the causal effect on us of atoms.

The atomists took the view that atoms had only what were later called objective, "primary qualities": size, shape, motion; "secondary qualities", colour, heat and the others, are subjective—that is, dependent on the experiencing subject—and derived as causal effects on us from the hooking together and rebounding of certain combinations of atoms. The ceaseless motion envisaged does not require a cause, or entail an animistic cosmos, because it has always been present; eternal motion is an inherent characteristic of matter.

These views led eventually to the modern mechanics of Galileo, and later Newton, which emerged from the 1,500 years of dominance by Aristotle, who tended to close the gap between appearance and reality. In a view like that of the atomists', which holds both time and space to be infinite, there is time and space enough for our world to have come into being by chance. What forms and events occur are, in fact, determined and depend on the behaviour of the atoms, the action of like drawn to like, and the determinations of size, shape, and weight.

The atomist theory of perception and thought is physicalist (materialist): bodies give off layers or films of atoms, and differently shaped atoms produce, by impinging on us, differently experienced qualitative effects. Soul, like fire, consists of particular small round atoms which can move easily throughout the body. The soul is dispersed after death, and part of the aim of the atomists was to free men of the superstitious fearful belief in an afterlife which might involve punishment.

In one way atomism tends to lead to paradox. The aim of atomism was to counter Eleatic views in providing an account and explanation of the empirical world—the world as it appears to the senses—rather than arguing that the apparent nature of its existence is simply contradictory and thus totally illusory and unreal; however, the atomist view leads to a scepticism about knowledge of the world, for the real nature of the ultimate constituents of the world can only be postulated, as they are in principle unobservable. The atomic theory provides an explanation of the world of our experiences only by being an explanation beyond empirical confirmation. The senses do not ultimately reveal the real nature of the world; the best that can be said is that the empirical world functions *as if* atomism were true. But the next step from this is epistemological scepticism. The atomists attempt to avoid this by saying that sensation can take us a certain way, then rational thought is required to penetrate into the deep nature of the world; and it may be that this slide from sensation to intellection is a matter of degree, not a difference in kind. Thus there is no logically necessary appearance/reality (phenomenon/noumenon) distinction; the inability to sense atoms directly is a contingent and not a logical necessity.

There is an additional problem for the atomists. Are the atoms theoretically indivisible, or only physically indivisible because of their smallness and absolute density (impenetrability)? If the atoms are not theoretically divisible, then this conflicts with the assertion that the atoms have size and shape; if they are theoretically divisible (just not physically so), then the original Eleatic arguments against infinite divisibility apply. Despite the difficulties, it seems that theoretical indivisibility (possession of Parmenidean oneness) must be asserted if the atomists' position is to retain its full force.

What the atomists themselves thought is open to scholarly disagreement.

Much later in the history of Greek thought atomism appears in the quietistic scientific and moral teachings of Epicurus (341–270 BC), which in turn were given memorable poetic exposition by Lucretius (c.100–c.55 BC).

CHAPTER TWO

Greek philosophy: Plato, Aristotle

The period of Greek philosophy that followed the Presocratics begins around 400 BC; the most important figures are Socrates (470–399 BC), Plato (427–347 BC), and Aristotle (384–322 BC). It is possible to discern a shift in interest in Greek philosophy away from explanations of the natural world to moral concerns, in the sense of discovering the best way for men to live. The difficulties of determining what were the objective or real features of the world, as opposed to those only apparent features which depended on a point of view (and hence were subjective), began to undermine the early explanations of natural science. If we are uncertain about what features of the world are real and what are only apparent, then it is unsurprising that such doubt will extend to the objectivity of moral standards. The threat was of moral anarchy.

To understand later Greek philosophy it is necessary to remember some unsolved problems derived from the Presocratics. In one sense Heraclitus stands at one extreme, Parmenides at the other. For Heraclitus everything is in flux; there is no being, only becoming or processes—although this becoming is subject to a cosmic *logos* or law of change. Heraclitus holds a compositional theory of identity whereby something remains the same thing only if the stuff out of which it is made remains exactly the same stuff. The world as it appears to the senses is argued by the Parmenideans to be an illusion: it is a world that appears to involve change and plurality, but these are impossible. The world for the Parmenideans is a plenum (full, or containing no void), and change, movement, plurality and diversity are impossible because they involve an *X* becoming a not-*X* (non-being, or a nothing); but even not-*X* is *something*, therefore not-*X* is self-contradictory, since it asserts of *X* both that “It is” and “It is not”. Thus the appearance of change and plurality presented to us by the senses is impossible, since it involves a contradiction; it is an illusion. One answer derives from Democritus and the other atomists; the

attempt is made to reconcile the explanation of the empirical world with the Parmenidean paradoxes; and the answer is to posit atoms with Parmenidean oneness of being in a void, which lies beyond the world as it appears. In just the way that Parmenidean arguments demand, these atoms do not, in themselves, change or have parts, but the appearance of change and diversity is explained by the coming together and dissolution of aggregates of atoms combined with the effect of these changes on us.

There are, however, problems with atomism. First, there is the difficulty that the atomic world is by definition beyond appearances; its existence cannot be empirically verified, it can only be posited, and cannot be known to exist. Second, the properties that the atoms are supposed to have are said to be objective or real because they are properties which are independent of observers. On inspection the suggested properties, such as size, shape, motion, seem to be equally dependent as properties such as colour and heat on one's point of view. Thus X can be large to you, but small to me; X can be fast moving to you, but slow moving to me; but it would be contradictory to suppose that X has both properties, and since we have no reason for choosing one appearance over the other, X cannot really have either of these properties. No property can be real if its being-what-it-is is dependent on the point of view or state of the observer in this way. Third, mere aggregates of atoms, which might be said to make up some thing (this horse), seem to give no account of the commonsense or pre-theoretical notion of separate or independent individual kinds: an independent "this so-and-so". "This so-and-so" is an independent or separable individual, uniquely distinguished from any other thing, and can undergo certain changes while retaining its individuality or identity as a "so-and-so". The "so-and-so" of an individual "this" is spelt out in its essential nature or "whatness"; the essence is those features which are necessary and sufficient for it to exist as a determinate kind of "so-and-so". This reflects the difference between an individual horse and a mere indeterminate lump of bronze. Without real or substantial separate individuals there is the suggestion that when we say something has become an X ("this so-and-so"), it is purely conventional or relative, and dependent on how our language happens to chop up the world; in reality no new substance has come into being at all, there has just been a rearrangement of the only true substances: the atoms.

These considerations lead to scepticism about our knowledge of the empirical world. One answer, proposed by the Sophist Protagoras (c.483–c.414 BC) is to embrace conventionalism or relativism, and say that reality is not something independent of the way human beings have come to divide things up through their thought and language; there is no reality which is the way things are, independently of the way we talk about it; what we take to be

relatively stable factors in the world are derived from facts about how we talk about the world. The danger here to universal ethical standards is obvious. If what in all cases we count as *X* and as ceasing to be an *X* is merely a matter of conventional fact or relative to a point of view then it could be thought to be a mere convention, or relative only to a point of view, whether *X* is morally good or right, bad or wrong. There is no longer any matter of objective fact; it is just a function of the way we happen to talk, it is a relative truth because our criteria for *X*, reflected in the meaning of the word for *X*, could change. In the case both of empirical and of moral assertions, we could adopt different conventions; and there would be no grounds to choose between one or the other derived from pointing to objective independent constraints in the world or outside our conventions, for there are none. What *seems* good, from a certain point of view, is good, and we cannot say objectively that one view is more legitimate than another.

Plato

Plato was born into an aristocratic Athenian family. He is, along with Aristotle, perhaps the most important figure in the history of Western philosophy. As a man he is difficult to know, although a strong personality plainly emerges from the many dialogues he wrote. Although he thought of entering politics, he became finally disillusioned with it following the execution of Socrates. Plato's own philosophical views take Socrates' views as their starting-point; and our knowledge of Socrates derives almost entirely from Plato's dialogues, in which Socrates is often the main character. Around 380 BC Plato founded the Academy for the propagation of knowledge and education for the future rulers of Greek city-states. The Academy would have been unlike a modern university, and more akin to a college where there would be ritual communal activities, such as taking meals together. Among the intellectuals of Athens were the Sophists, or "experts", who, unlike Socrates, charged for their teaching services, giving instruction on rhetoric and efficacious behaviour in public office. Socrates, like Plato, considered Sophist claims to knowledge ill-founded, and set out to expose this fact; generally Socrates regarded them as ignorant men who, worst of all, did not even know they were ignorant. The curriculum of the Academy included philosophy, mathematics, astronomy, and some natural science. Later in life, Plato became reluctantly involved in a disastrous visit to Sicily aimed at educating Dionysius II. Plato perhaps felt the need to try to put his political philosophy into action. He returned to Athens, and sheltered from the political storms around him. He died at the age of eighty years old.

It is against the Presocratic background that the views of Socrates and Plato emerge, starting with a concern for ethical matters; but the same overall approach is applied to knowledge generally. Questions are asked, for example, about what is good or what the good is; for surely knowledge must be knowledge of what *is*. We can apply this by taking the example of justice. Socrates does not simply state an answer to the question; rather he admits his ignorance and asks his interlocutors for *hypotheses*, which start with experience and the inductive gathering of particular cases as a first step; he then goes on to test the hypotheses through arguments demonstrating their consequences, and shows that the answers merely give an *example* of the thing he is after, and an example, moreover, that cannot be justice-in-itself, but is merely justice from certain points of view that cannot universally be called justice. What he is after is justice-in-itself (the Just); justice without qualification or unconditionally. For it is in virtue of a fixed justice-in-itself that all things, or all cases, which we correctly call justice are justice. All those things we call just must share some common and peculiar characteristic in virtue of which we are correct to call them all just. To act justly, we need to know what justice truly is. If we talk of X without knowing what X is, we literally do not know what we are talking about. What Socrates is seeking is a true or real definition; that is, not merely an account of how we, in fact, use a word, nor a stipulated use, but a definition that tells us of the true nature of the object or quality to which the word applies; that is, its *essence*. This is similar to asking for an objective account of what is justice, independent of any points of view.

To have knowledge of something, X, involves understanding what we truly mean by the term "X"; and understanding the true meaning of "X" involves saying what X *is*—what the essential fixed nature of X is—what it is for X to be the kind of thing it is. Socrates is concerned not chiefly with the meaning of the word "X", but with the object X, and the real nature of X as determining the true meaning of "X".

Plato holds a realist theory of meaning and knowledge. The meaning of terms and that which we come to know is a process of *discovering* an existing objective reality "out there", not a process of creation which is relative to the apparatus—for example, language, or the senses—we use for the inquiry. This notion of objectivity and invariance of standards—of being able to say what X *is*—applies to ethics and aesthetics, as well as science and mathematics; without fixed reference points for the meanings of classificatory terms, all significant talk about the world would be impossible; the world would be a stream of unique ineffable particulars. The meanings of words are, or can be, determined by the nature of reality—in existing objective references—not the other way around. And if knowledge is

possible, it must be knowledge of objects which are real; and this requires that knowledge be knowledge of what *is*; that is, objects that are not in states of becoming, but are eternal, immutable beings. To make our meanings match the world as it really is, is to seek true or real definitions, and requires *objects*, which the definitions are definitions *of*. The meaning of the word "justice" is not, in Plato's view, a mere conception in the mind, but is fixed mind-independently.

In agreeing with Heraclitus that the sensible world is in flux, Plato realizes that the *objects* of such definitions are not going to be found among imperfect and mutable sensible objects, but exist in a supersensible realm of immutable objects "seen" by the intellect beyond sense-experience. In the world we never find justice-in-itself, but only conditional justice. One can always find conditions in which, derived from a changing world or a different point of view, a just action ceases to be a just action. Plato thinks there has to be something that is invariable and common which corresponds to the meaning of universal terms such as "justice" or "bed", that exists over and above the variety of particular instances that terms—such as "justice" or "bed"—cover, and that justifies the classification or grouping of various different things as of the same sort or class. What we mean by "horse" in general, if it is meaningful at all, is something other than any particular horse, each of which differs; each horse is a horse because of its sharing in a nature common to all horses.

It is from the search for definitions of universal, immutable, ethical standards that Plato's theory of Forms emerges as the basis for all knowledge (*epistēmē*) in its full sense. Plato turns Socrates' search for definitions, aimed at understanding the nature of what we are talking about, into an ontological claim whereby the real meaning of classificatory terms requires a reference in a transcendent object or Form (*eidos*). It is not just knowledge of ethical truths that requires the Forms, but all claims to knowledge. Indeed, it applies to knowledge itself, for if we cannot suppose there is some fixed meaning for the term "knowledge", referring to some fixed object, knowledge-in-itself, then surely intellectual chaos must ensue. Plato assumed that for a word to have any fixed objective meaning, this must be in virtue of a fixed and objective entity to which the word refers. This assumption can be questioned.

It is essential for the understanding of the theory of Forms to see why epistemology and metaphysics are so closely connected in Plato's philosophy: the *nature of knowledge* should be matched by an appropriate *ontology*. Knowledge is always *knowledge of* something, and Plato requires these objects of knowledge to bear in their mode of existing (the way they are as objects) the same characteristics as the knowledge we have of those objects. For Plato, two main conditions have to be met for the highest sort of knowledge.

(a) *Universality or objectivity*

Knowledge of something is not relative to a point of view; knowledge should be something that would be true from any point of view.

(b) *Unchangingness, eternity or immutability*

This requires that knowledge is unchanging over time; that if something is knowledge, then it is knowledge once and for all; it cannot cease to be knowledge. Knowledge in its highest sense is infallible: it is absolutely certain. If one really knows something, there cannot be conditions under which what one knows is wrong, and ceases to be knowledge. So one knows only what *must be* true—necessary truths—and cannot be false, and when there is a method of demonstrating conclusively that the known truths are necessary truths.

There are two factors that make the world of sensible objects unsuitable for knowledge.

(a') That things and properties in the sensible world are not fully real, since they are not unconditionally what they appear, as how they appear depends on a point of view. Sensible things can take on contrary properties for this reason as well if one's point of view changes; the properties sensible things appear to have is therefore determined partly *subjectively*.

(b') That things in the sensible world are constantly changing. In this way sensible things can take on contrary properties over time; the sensible world is one of *becoming*.

Anything that can take on contrary properties cannot be fully real, since it never unconditionally just *is*, and we cannot be said to be knowing things as they are in themselves. Plato gives strict conditions for knowledge: certainty, universality and immutability. He further needs to show, if knowledge is possible, how we can satisfy those conditions; the Forms of the theory of Forms provide objects which satisfy the conditions for knowledge. Knowledge is knowledge *of* something; that is, it requires an existing object; there must be objects of knowledge that match the characteristics of knowledge proper (knowledge in its full sense) itself if such knowledge is possible at all. These objects are the Forms. The Forms are not objects in the sensible world; sensible objects both are mutable and have properties that vary with one's point of view, and so are not fully objective; nor are the Forms posited entities that underlie appearances in the way that atoms do. Forms subsist beyond the flux of experience and space and time in a transcendent, supersensible realm that is ultimately perceived purely by the *intellect*. The Forms are pure objective essences, and as the objects of knowledge they match the characteristics required of knowledge itself. As opposed to the "thatness" or existence of things (*that X is*), the Forms define the

“whatness” or essence of things (*what X is*); the Forms give necessary and sufficient conditions for things to be the kind of things they are. The Forms have the following important characteristics.

(a'') *Universality or objectivity*

There is no point of view from which the Form of *F* could be sometimes *F* and sometimes not-*F*; if something can be both *F* and not-*F* depending on a different point of view or different circumstances, then we cannot have found *F*-in-itself: the Form of *F*. The Forms are also what is universally or objectively true from any point of view. Apprehending what things-are-in-themselves is to grasp their Form. As well as being objects of knowledge in themselves, the Forms are the extent to which anything can be said to be universally or objectively true of sensible objects apart from their various appearances.

(b'') *Unchangingness, eternity or immutability*

Since the Form of *F* is immutable and indeed eternally what it is, there is no time at which the Form of *F* can become not-*F*, it is eternally *F*. Forms are fully real in that they are not characterized by any becoming; they are being. They are what a sensible object which copies or participates in a Form really *is* apart from its changing states. The Forms are separate *in some sense* from the world of sensible objects and their nature grasped by the sense-independent intellect; their separateness seems to consist of real existence or ontological independence apart from both sensible things and minds.

Taking (a'') and (b'') together gives the conditions for the mode of being of fully real existence, and this matches (a) and (b), the conditions for knowledge proper.

Plato seems to hold that the realm of Forms is separate from the realm of sensible objects, but exactly in what this separateness consists is not clear. The sensible world is ontologically secondary; although later in life Plato became more interested in natural science. It is worth noting that since the Forms are not in space or time, it is senseless to ask where the Forms are. It is the ontological separateness of the Forms from particulars which is criticized by Aristotle.

It may not be immediately obvious why we cannot be said to have knowledge of particular truths. Surely I can know that “there is a table in my room”? However, it is worth noting that, regardless of its certainty, we would hardly regard this as a piece of *scientific* knowledge; it is not a universal explanatory law. Plato does not deny that something beyond ignorance is possible in these cases: we can have belief (*doxa*) which is true. But the *highest* form of knowledge, knowledge in its full sense, is of universals or objective essences. Knowledge proper is not of this or that table, but of tables-in-themselves: knowledge of what is involved in something being a table:

tableness. Knowledge proper transcends the bounds even of all possible experience, and involves an intellectual “seeing” that reveals things as they are in themselves. If something is known in the highest sense to be true, it cannot become false. If X is known, then necessarily it is true that X . Plato goes further in holding—although it does not follow from the assertion that knowledge entails truth—that if X is known, then X is a necessary truth. Plato holds that what is known must be true in the sense that what is known is only necessary truths; knowledge is of things that could not be otherwise. If what is known ceased to be true, it would cease to be knowledge. Take the example “This water is hot”. The problem here for knowledge is that (a) “This water is hot” can be true for one person, but false for another, and (b) the water is something that is in a state of becoming (becoming cold perhaps), so “This water is hot” is true, but will become false. That which has no fixity cannot have true descriptions applied to it, for what is true becomes instantly false.

The model for the ideal of knowledge is to be found not among the mutable and relative truths concerning sensible objects, but among the eternal and universal truths concerning the objects of mathematics and geometry which are known by the intellect. The truths of arithmetic and geometry concern not this or that object (say, a particular triangle), or this or that set of objects (say, two pairs of objects), but rather *triangularity* and $2+2=4$. Knowing the truth $2+2=4$ does not concern any particular two objects, which might through change become one or three objects, or which only look like two objects when viewed in a certain way, or any sensible objects at all. Knowing the truth $2+2=4$ concerns *twoness*, and its relation to other essences, such as equality, addition, and fourness. This is not a truth that varies over time; indeed it is eternal or timeless, and stands outside time; and, as such, this known truth requires an eternal object of which the known truth is true; that object is a Form or combination of Forms. The objects of the sensible world are not suitable objects for such necessary, objective, immutable truths. Take the example of equality: if we have two sticks of equal length, and also observe that they are six feet long, we may be tempted to say that being equal (equality) consists in being six feet long; but there are circumstances in which being six feet long would be both equal (F) and unequal ($\text{not-}F$); so we do not yet know equality-in-itself because we have identified something—being six feet long—that can be both equal and not-equal, whereas to know what equality-in-itself is is to know it irrespective of changes over time, point of view, or conditions. Equality as such must also be what all cases of equality have in common irrespective of their particular differences.

The world of Forms is “perceived” by reason or the intellect, not the senses; the Forms are objects of intellectual vision or looking.

Geometrical truths concern not this or that circle or triangle, nor even generalizations about all empirical circles and triangles which are

also approximate and imperfect, but circularity and triangularity as such known by the intellect alone—in short, they deal with essences—with the Xness of objects under the common name “X”. It must be noted that mathematical truths are one step down from knowledge of the Forms themselves because mathematics still involves unquestioned assumptions; but since mathematical truths known by the intellect alone are superior in certainty and immutability to the deliverances of the senses, they can be used as a stepping stone toward knowledge of the Forms.

At a lower level than mathematics, we can further understand the Platonic ideal of knowledge, and the requirement that it be objective, through analogy with scientific laws of nature: Newton’s first law of motion, “Every body continues in its state of rest, or of uniform motion in a right line, unless it is compelled to change that state by forces impressed upon it”, is not a law applicable only to particular bodies, or bodies considered from a certain point of view; it at least applies to all bodies at all times and in all places. Moreover, it may be said to apply to bodies-as-such; that is to say, it is a truth which can be known about the essence of bodies; to be concerned with the essence of bodies is to be concerned with what all and only bodies have in common, that which is necessary and sufficient for them to be bodies, which is correctly called “body”.

It may be concluded that if knowledge of the Forms is the only true knowledge, then there can be only ignorance of the objects of the sensible world, and therefore that the sensible world is neglected by Plato. But this is not the case. That the world perceived by the senses is not fully real because it is subject to becoming (it never just “is”), and it cannot be the object of universal, immutable, unconditional truths, does not mean that it does not exist. The existence of immutable Forms divides the world into various fixed kinds of things as they are in themselves, and is the formal and final *cause* of the sensible objects in the world (the world of becoming) having whatever limited degree of being of which they are capable. “Cause” should be understood here in a more general sense than that to which we are accustomed: causation is an answer to a “Why?” by a “Because...”. The Forms are “formal causes” in giving definite character to things which we bring under common names (“man”); the Forms are “final causes” as the perfection towards which that kind of thing aims as an end. As formal causes, the Forms are a precondition for our saying of anything that it is something of a specific kind; they define and make definite things as objects of a certain type; they are thereby causes by giving definite character and a limited degree of type-identity to the flux of the sensible world.

Although Plato never answers the point, one assumes there must be some limit to the number of classificatory divisions; if every positive common name has a Form, then the danger is of an

unlimited and unknowable world of Forms. Relative terms such as “large” are also problematic. Although the Forms do not give us eternal, immutable particular sensible objects—for only universal kinds or types are eternal and immutable—they give to sensible objects a stability somewhere in between the being and non-being of Parmenides, avoiding thereby the universal becoming of Heraclitus; and of these sensible objects of relative stability we are able to have true beliefs, if not knowledge. Plato points out that “is” does not always mean “exists”. The exhaustive choice is not being *X* (existence) and non-being *X* (non-existence or nothing); for we can say that *X* can be an *X* while losing some properties and gaining others. To say that a person *X* was hairy and is now bald is to say there has been a change in *X* not from existence to non-existence, but from being hairy to *X* being not hairy (bald). At the same time, Plato attacks Protagoras’ relativism, which claims that universal objective knowledge is not possible at all, and that we are merely left with *particular* knowledge claims about immediate experience, which are perhaps infallible (cannot be mistaken) in themselves, but which are true only from a certain point of view at a certain time, with no claim to *universality* or generality at all.

Plato’s answer to both Heraclitus and Parmenides is the Forms. Plato agrees with Heraclitus that the world of sensible objects is ultimately in flux, and he agrees with Parmenides that the intellect alone knows the true nature of reality. Knowledge proper is of immutable and eternal truths and must concern the nature of immutable, eternal objects that really exist; but the sensible world reveals only mutable, non-eternal objects; therefore, if knowledge is possible, it must concern a realm of immutable, eternal objects that really exist, beyond sense-experience, that are intuited or seen by the intellect alone; those objects are the Forms.

Plato’s epistemology and metaphysics mirror each other: the Forms which have only being are fully knowable; of utter non-being there can only be ignorance; but in between these is the sensible world of becoming of which there can be true belief which lies between full knowability and complete ignorance. This gives the following picture.

Being (Forms)	– knowledge
Becoming (sensible world)	– true belief
Non-being (nothing)	– ignorance

The way to approach true knowledge is by the method of dialectic: giving, improving, and eventually destroying, hypotheses—assumptions used for justification in the sense of reasoned grounds for what we claim to know. Claims to knowledge are thereby based on fewer and fewer, and different, assumptions. For it to be said that I know *X*, it has to be the case not only that I have beliefs, even if they are true, concerning *X*, but also that I can give an account of why it is true

that *X*, or what *X* is; a proper account or justification marks the beginning of the distinction between belief and knowledge. Giving an account of *X* is saying what it is that makes it *X*. The account that I give may be based on assumptions which are not themselves beyond question. If I try to account for *X* being true by deducing *X* from certain premises, then it can be asked what justification I have for these premises. I can answer this challenge by deducing the initial premises themselves from more general premises. The method of hypothesis is a process of questioning and testing deduced consequences of hypotheses. The intellect or thought transcends, in mathematics, hypotheses about the imperfect, approximate, objects of experience. We successively ascend from hypothesis to hypothesis, until we eventually reach the Forms, and ultimately the "First Principle" or highest Form the "Good" or "Being" or the "One", which is said to transcend even being, and which is self-authenticating (unhypothesized) and destroys the need for hypotheses.

Another related description of the dialectic found in the later work of Plato is the method of division and collection: this is the process of collection and division into genera and species, and it suggests a hierarchy of Forms; the Forms are complex wholes which are divided through genus and difference by species. The logic of the dialectic is matched by an ontological process; the logical collection of species under genus is like the blending into one another (in the manner of colours) of different Forms. The aim of division in the dialectic is to give real definitions of terms referring to indivisible "atomic Forms" (*infima species*) such as "man", "horse", "tree", that have no sub-species and designate species or universals, not particulars or individuals. The "atomic Forms" cannot combine at all: so the expression "man horses" makes no sense at all. The hierarchy of Forms is describes a hierarchy of reality or degrees of being proportional to permanence and generality. Below the "atomic Forms" there are only individuals (for example, individual men), not further species. Alternatively we can, by collecting species, ascend in the hierarchy to ever more pervasively general categories of being, to Forms of ever richer content and greater degrees of being. It has also been suggested that Plato envisioned some kind of mystical road to the highest Forms, as well as the rational dialectic.

Plato's view on epistemology and metaphysics can be summarized, although not entirely in his terminology, in the following way. Reality should determine language to give objective concepts which are not our creation, but rather fixed, and imposed upon us. The highest sort of knowledge is of objective necessary truths, which are discovered by the intellectual inspection of the ways that non-conventional objective universal concepts—discovered and not arbitrarily created—are connected or not connected to each other. The necessary connections concerning the highest sort of knowledge are found by intellectually

seeing the inclusion or non-inclusion of the true meanings of common words—concepts—in each other. These concepts are objective in describing the real eternal immutable nature of the Forms, which are real eternal immutable objects. Some Forms are the essential features of the objects to which common names refer, and determine and tell us what each thing is in itself. The essential nature of a thing includes only those features which are necessary and jointly sufficient for it to be the kind of thing it is. The essential features are revealed in a true or real definition of what it is for a thing to be of a determinate kind.

It is important to see that for Plato the concern is not with the necessary connection of propositions, or merely with the meaning of words, but with the nature of the objects the words stand for: real immutable eternal objects—the Forms with the required characteristic of being—understood by the sense-independent intellect through their descriptive concepts revealed in definitions or formulae. These ontological connections are revealed by linking the true meaning of terms which name Forms, given by a true description of essences in real definitions (providing a correct account or *logos*), which give concepts of eternal existing objective Forms. The connection of these concepts which name Forms is seen by the intellect in the inclusion or non-inclusion of the meaning of one concept in another. This produces, in the case of inclusion, a logically necessary truth concerning the connection of the objects referred to. Such necessary connections, which depend only on the inspection of correct meanings, produce truths logically independent of experience. We can know necessary truths by showing conceptual connections; and such necessary truths are necessary because the terms in these truths have as their reference eternal immutable objects—Forms—which are not, and cannot be, objects of sense-experience, but are objects of the intellect. The dialectic method is deductive, ensuring that knowledge is infallible (non-revisable) and certain; a truth known by the correct use of the method cannot be shaken by new evidence. The dialectical method for justifying truths cannot be valid by degree. It provides a way of making the justification element in our knowledge a conclusive logical proof: it is a valid argument deduced from necessary truths. In this way the necessary truths which are known are conclusively shown to be necessary, and hence to have the absolute certainty and immutability required of knowledge proper.

The Platonic dialectic of collection and division approximates to the modern notion of analyticity, and the discovery of analytic truths; but Plato thinks that these are objective truths (they are true of the Forms) and independent of the factual conventions of linguistic usage.

The inclusion and non-inclusion of meanings can be illustrated as follows: “man” is included in the concept “animal”; and under the concept “animal” falls the array of different animals; so “man is an animal” is a necessary truth; whereas plainly “man” does not, and

indeed cannot, include the concept "fox". Man and trousers are connected, if at all, only contingently because the concept "man" (real meaning or definition of "man") does not include "trousers"; so "man wears trousers" is not an eternal truth, and is not an object of the highest knowledge (*epistēmē*), but a matter of belief (*doxa*), perhaps true belief, about a contingent fact in the sensible world.

No necessary truths picking out necessary connections can be discovered in the sensible world; yet this is required if knowledge of the sensible world is possible—in the highest sense of being absolutely certain or infallible and eternal. Otherwise there are only correct beliefs concerning contingent truths in the sensible world. If what is known is a necessary truth, and can be shown to be a necessary truth, then it is absolutely certainly known, since it is impossible that it could be false. In any case, knowledge of the sensible world is dependent on the availability of the absolute objective fixity of the concepts we bring to the world, and this is guaranteed only by the absolute objective fixity of concepts' references in a real, supersensible realm of Forms "perceived" by the intellect. Whether, and how, such Forms, articulated in concepts, can be connected with the sensible world is a difficult question. But even to say of anything that it "is X" ("is yellow") is to use the concept of being (being X) that goes beyond the particular yellow percept, which may change. In the same way being able meaningfully to say "that is a man" presupposes the conceptual fixity of "man". Plato thinks that meaningful talk about the world must involve both that there must be absolute conceptual fixity of meaning and also that such meaning is derived from a special object: a Form.

There is an ascent to the Forms, and through the hierarchy of Forms, until what we claim to know is a truth, where the justification is deduced, by way of the relation of real definitions, from a starting-point which is self-authenticating, completely certain, and involves no assumptions. We aim to ascend to this "First Principle", from which we see the whole of reality as a connected rational system based on the absolute objectivity of the Forms. To the extent that anything like knowledge of the sensible world is possible—and Plato's interest in natural science increased in later life—it involves a downward dialectical process in the hierarchy of Forms: in this, one initially proposes the most general class to which the thing to be defined (the *definiendum*) belongs, until through division by similarity (by genus) and difference (by species) we have specified the narrowest class the thing defined belongs to; then we shall have knowledge in the fullest sense of what the *definiendum* is: this gives the necessary and sufficient conditions for a thing being the kind of thing it is. For example, the definition of "triangle" combines the genus of "triangle" as "polygon" with the species of polygon "having three sides" into "polygon having three sides". This fixes *what* a triangle is.

The taxonomy of the unchanging hierarchy of Forms is the true object of knowledge. Through the Forms is revealed, in the terminal definitions by genus and difference, the essence of things sharing a positive common name. We also come to know the rules of combination or blending of those Forms, since not all Forms can blend together. An assertion suggesting the blending of incompatible Forms—"motion is rest"—is a contradiction.

False judgements are not about *nothing*, but concern elements which exist—say, the particular Theaetetus and the Form flying—but which, in combination, are judged to assert falsely "Theaetetus flies". Indeed, every meaningful statement involves at least one universal or Form. Through studying the interrelation of the Forms we come to know the true unchanging or eternal structure of reality. The highest Form—the "Good" or "Being"—is the genus of all that is real; a real whole covering—common to—all and only that which is real. That is, the highest Form is the essence of reality as such. The Forms exist in a world that transcends both the physical and mental, while they are somehow related to particulars. The Form of the "Good" or "Being" is the aim and aspiration of all things, the ultimate ground of the world's intelligible reality through defining the nature of being or reality itself or as such.

Our ability to have knowledge of the Forms, transcending the sensible world, is explained by Plato's theory of recollection. One way of interpreting this theory is to see it as Plato's attempt to account for the possibility of *a priori* knowledge; that is, truths known by the intellect alone independently of sense-experience. At some time before we were born, our immortal soul was disembodied and was thereby not confused and distracted by sensible particulars. Our soul is part of the eternal realm, and so able through pure reason to grasp the nature of the Forms themselves. Indeed, the possibility of knowledge of essences—the Forms—is taken as proof of our immortality. Sensible objects remind us of the perfect Forms we have forgotten, of which sensible objects are imperfect copies, and which have being only in so far as they partake of the immutable divisions of reality or being of the Forms. The extraction of universals by comparing sensible objects with a common name can be a starting-point for reminding us of the Forms, but it is not sufficient for knowledge of the Forms; rather, a productive starting-point of classification assumes that it is an objective classification contained in the Forms of which the classification of particulars reminds us.

It is tempting to think of the Forms as perfect particular instances of sensible objects. But this cannot be so. Plato was aware of this in the "third man" argument: if all the instances of *X* are instances of *X* by having in common some feature embodied in the Form *X* (*Xness*), and the Form of *X* is itself an instance of *X*, then all the instances of *X* and the Form of *X* taken together are instances of *X* only in virtue of some further Form embodying common features in virtue of which all the

instances of *X* and the Form of *X* itself are *X*. And so on to infinity. There is no doubt that the nature of the relation of the Forms to sensible particulars presents Plato with difficulties, whether this relation is said to be one of copying or resemblance, or one of participation. If the relation is one of resemblance, there is the problem revealed in the "third man" argument. If the relation is one of participation, then we have the dilemma of deciding whether the Form is present in each instance in its entirety or whether each has a different part of the Form: in the first case the Form which is supposed to be one or unitary is yet in its entirety in many individuals, in the second case we lose anything common to, or the same in, all the instances, and the Form is both one and many or divisible.

One way of thinking about the Forms is to consider them not as entities which are perfect instances of sensible particulars, but more as akin to formulae known by the intellect. This brings to mind the Pythagoreans, for whom Plato had some sympathy. There is a completely general formula for a circle, but the formula is not itself circular or an instance of circularity; the formula may be verbal as "a plane figure bounded by one line every point of which is equally distant from a fixed point called the centre", or as an algebraic equation. In the same way the formula or definition of man or bed is not itself an instance—even a perfect instance—of a man or a bed.

The main feature of Plato's achievement is perhaps the way he laid down the highest standards for knowledge as absolutely universal, certain and necessary—a standard for which scientific knowledge has striven. The standard is too high for natural science. Nevertheless, it points scientific knowledge away from the particular case toward unifying and inclusive truths of greater general explanatory power and scope. Science does not deal with particulars, which in their full particularity are unknowable, since the inevitable use of universal terms means they can never be pinned down in their unique particularity. Scientific knowledge deals with generally applicable unifying truths concerning the underlying common or general features of an apparently enormously diverse world. Thus it will concern itself, at one level, not with this table and that table, or tables and cows, in so far as they differ and are particular, but with giving a unified explanation for their behaviour under their common nature or feature of all being bodies or material objects. Science is concerned with the structure or nature of an underlying general explanatory reality which is fully objective and rationally understandable.

Aristotle

Aristotle (384–322 BC) was born the son of a prominent physician, in Macedon in north east Greece. The medical interests of his family

encouraged his own later detailed empirical works in biology, which influenced his philosophical outlook. At the age of seventeen he became a student of Plato's Academy, and later a teacher there. In the early days he was generally in agreement with Platonic philosophy, paying particular attention to the *Phaedo*, and only later, in important respects, did he reject Plato's philosophy. Nevertheless, he continued to share Plato's opposition to scepticism, and agreed that knowledge is possible; it is on how the sceptical problem is to be solved that they differed. Aristotle was predisposed to take a greater interest than Plato in the natural world, of which Aristotle thought knowledge is possible. Following the death of Plato, Aristotle left the Athenian Academy, and was eventually tutor to the heir to the Macedonian throne, Alexander the Great. Aristotle returned to Athens in 335 BC, and taught at the Lyceum; but following the early death of the all-conquering Alexander, resentment arose at the Macedonian domination of Greece and the city-states; this made Aristotle's position in Athens, as an alien with Macedonian connections, increasingly uncomfortable. A charge of impiety was brought against Aristotle; rather than be the central character in a replay of the fate of Socrates, he left Athens in 323 BC. Unable to return home to Stagira, the city of his birth, which had been destroyed, he went to the remote city of Chalcis, where he died in lonely exile in 322 BC at the age of sixty-two. He married twice, having been once widowed; by his second marriage he had a son, Nicomachus.

The philosophy of Aristotle owes a great deal to Plato. First, although Aristotle rejected Plato's theory of real separately existing Forms, he held on to the notion of forms as the unchanging reality providing the basis for knowledge proper of what things are. Plato's intelligible Forms are essences or defining formulae that really exist as separate entities transcending the sensible world and minds. Aristotle's intelligible forms are immanent (in-dwelling) in sensible particulars, and cannot, unlike Platonic Forms, exist apart from particulars; the Aristotelean forms can be separated from particulars only in thought, although they are objective and not subjective or mind-dependent. Second, Aristotle supports anti-mechanical, teleological methods of explanation. Teleology is not so much an empirical hypothesis as a decision to adopt a certain method of explanation. It aims to explain why things are as they are by referring to the ends to which they aim; the end is being perfect, or fully developed, specimens of the kind of things they are. It is reasonable to see Aristotle as synthesizing Platonic realistic abstraction with a concern to explain the natural world found among the Presocratics.

Aristotle agrees with Plato that knowledge proper or scientific knowledge (*epistēmē*) must be certain and necessary; knowledge is of invariant or unchanging universal necessary truths. Knowledge must be knowledge of something. Aristotle shares with Plato the notion that

if knowledge is possible, knowledge must be of what is real, and what is real is eternal and unchanging. In short, the necessary truths we know must be matched by their referring to ontologically suitable objects.

Aristotle rejects Plato's solution of positing as the true objects of knowledge a realm of separately existing essences, the Forms: first, because he thinks it only duplicates our problems concerning knowledge of the world, and second, because Plato gives no clear account of how individual objects in the world are supposed to participate in, or resemble, the Forms.

Knowledge for Aristotle consists in a systematically connected set of disciplines. Metaphysics (First Philosophy) is the most general and fundamental aspect of all knowledge because it studies being *qua* being. Unlike each individual science, metaphysics examines not this or that sort of thing, but existing things, or being, as such; it restricts itself to understanding that which is common to all and only things which are real and have being; it studies those features of things which they have merely in virtue of their existing as real things at all.

If the world is in constant flux, as Heraclitus suggests, then it cannot contain eternal unchanging objects suitable for knowledge. If we adopt, on the other hand, a Parmenidean view, all change and plurality in the world are illusions, for they involve logical contradictions: *F* becoming not-*F*; hotness becoming coldness. Atomism may seem to point to a way out, for atoms remain the same (have being) through change; indeed change is simply a rearrangement of the same atoms. Aristotle rejects atomism (or materialism) because collections of atoms do not do justice to our common-sense, or pre-theoretical, notion that there really are separately existing individual instances of kinds of things. Atomism allows no distinction in kind between a mere heap of bricks and a horse which is a genuine substantial separable, hence bounded, kind of thing. Although a brick may be an instance of a "so-and-so", a heap of bricks is not identifiable as a new "this so-and-so". Matter alone is not a "this so-and-so" (it does not pick out, say, *this horse*), for it is common in its nature to different kinds of particulars, and thus cannot differentiate between them as particulars of different types.

The important point is that the talk of the kinds of things there are in the world which concerns Aristotle corresponds to real or natural kinds; the way things are grouped together by kind, if properly carried out, marks real objective divisions in the world made by nature herself, not merely the arbitrary or subjective classification into groups imposed by us on individuals which are in some way similar.

For these reasons Aristotle posits *substance* as that which has identity or stability through change. Aristotle notices that when we talk about the world we distinguish between certain factors that alter

and certain factors *to which* the alterations occur which can remain the same. Substances are, in a sense, pivots around which change occurs.

This is supported by the logical analysis of the carrier of all true or false assertions about the world: the proposition. In Aristotle's view propositions always contain two elements: the subject and the predicate. Predicates are what is said to be true or false of subjects. Subjects can remain the same while having different, or indeed contrary, predicates applied to them, and predicates logically depend on there being subjects.

Predicates, whereby we say things about subjects, can be grouped in different sorts or *categories* that are the highest *genera* or classes of being and together may cover all modes of being. Aristotle gives the ten genus categories as: substance, quality, quantity, relation (which are the chief categories), place, time, less temporary condition/state, more temporary condition/state, activity, passivity. Under the genus category of relation, how something is related to other things, there is among others the *species* of spatial relation, an example of which is: X is to the left of Y. The metaphysical counterparts of subjects and predicates are what these terms stand for. The most fundamental category is that of substance; predication in this category tells us, concerning the subject of a proposition, what kind of thing it is: X is a horse. To say *what* kind of thing X is, is to give its *essence*; the other categories of predication are of *accidents*, and these depend ontologically on, and are always predicated of, substances. The essence or "whatness" of a thing is given in a real definition or formula which provides the necessary and sufficient conditions for a thing to be *what* it is; an essence is what is common to all and only things of a specific sort in virtue of which they are the sort of things they are. This is a logically separate question from whether there exist things of that sort: the existence or "thatness" of a thing. In short, the essence refers to *what* it is to be an X; the existence refers to the fact *that* there is an X; and one can know what an X is without knowing that an X is. The essence of X therefore defines what we *mean* by an "X".

A term such as "horse" is a species substance term identifying a species of a substantial separable way-of-being; a species quality term such as "pale" is a non-substance term identifying a species of a non-substantial non-separable way-of-being. In either case, contrary to Plato's theory of Forms, there cannot, metaphysically speaking, be universal attributes such as horseness without horses or paleness without some object or other that is pale. But whereas an instance of the way-of-being of a substance never depends for its way-of-being on its predication of any other way-of-being, the way-of-being of a non-substance always depends for its way-of-being on its predication of some other way-of-being. This indicates that the relation between substances and accidental attributes is asymmetrical. It always makes

sense to ask, if any non-substance term such as "pale" is applied, "What is it that is pale?". It makes no sense to ask, if a substance term such as "horse" is applied, "What is it that is horse?". The logical point about subjects and predicates, and the corresponding metaphysical dependence of some ways-of-being on others, led Aristotle to formulate two senses of *substance*.

- (a) It must be that which is always a subject of predication, and never predicated of any subject.
- (b) It must be that which has an independent or separate way-of-being or mode of existence.

What satisfies these formulations, and is substance in the *primary* sense, is concrete individuals of various identifiable kinds that can exist separately: they are those instances of whatness or ways-of-being that have a separable existence. These are independent subjects which can undergo certain changes while they remain identifiable as the same kinds of individuals. Substances are still pools of being in a sea of accidental becoming which avoid the conclusion that every change of a subject of change is a change *in* the subject of change. The subject Socrates can change from young to old, pale to flushed, and yet he remains the same individual: an instance of a man. The Greek word Aristotle uses for substance, *ousia*, is derived from "to be": substances are the *most primary* ways-to-be identifiable as "this so-and-so" (the Greek is *tode ti*), of which all other ways-to-be are predicated modes, and on which those other ways-to-be are dependent for their existence as ways-to-be. Paleness as a way-of-being depends for its existence both on some instances of paleness and on objects of some kind or other being pale; but the instances of kinds of objects which are pale, if they are substances such as this man, are not dependent on their being predicated of instances of any other kinds of being.

Primary substances are not, however, the objects of science. Science studies universal necessary features of the objects of the world, not this or that object in its particularity. Aristotle supports the commonsense or pre-theoretical view that individuals fall into determinate *natural kinds* of things. Thus individual men fall into, and are instances of, the natural kind man, and individual horses fall into, and are instances of, the natural kind horse. Aristotle refers to the universal predicates that define the properties that individual instances of a natural kind must have in order to be the kind they are as substance in the *secondary* sense: *substance* because they are the objects of science, *secondary* because the being of a certain kind as such is dependent on there existing individuals or instances of that kind. There cannot be independent "so-and-sos", or bare types as such, "floating" around, unattached to particular "thises"; there cannot be the universal essence horseness existing without there being particular horses existing. So we have *two* meanings of *substance*:

- (1) Primary substances: individual instances of the class of universals, designated by a certain category of predicates, which can exist separately being what they are—"this so-and-so", this X, this man, this horse.
- (2) Secondary substances: the universals, designated by a certain category of predicates, which are the properties defining real or natural kinds or what something is, of which primary substances are instances: "so-and-so", Xness, man, horse.

Logically speaking, secondary substances are a special class of predicates. The secondary substance predicates designate certain sorts of property, the sorts of property which are the *essential* defining properties of a thing that tell us what a primary substance is, and which it cannot lose without ceasing to exist as the kind of thing it is.

In addition there are non-substances:

- (3) Non-substances: the classes of universals and particulars, designated by certain categories of predicates, which are not capable of independent existence as identifiable instances of kinds or ways-of-being—X, a heap of bricks; Xness, paleness.

The categories of universal predicates which identify non-substantial dependent ways-of-being are *accidental* properties; these are properties which a primary substance can gain or lose while continuing to exist as the kind that it is, that is, while remaining the same identifiable kind of individual.

In the case of (3), non-substances are not primary substances, either because they are not capable of separate existence as instances of what they are (for example, paleness) even though they may designate a universal, or because they are not identifiable individual kinds or ways-of-being at all (for example, a heap of bricks) even though they are capable of independent existence.

A genuine *substance* must for Aristotle satisfy two conditions: it must be *both* a determinate instance of a "so-and-so" or "whatness" of some identifiable sort *and also* capable of separate existence as that way-of-being such that it is not a modification or qualification of the way-of-being of any other thing. A substance is both an individual instance of a universal—an identifiable "this so-and-so"—and a way-of-being that can exist separately, not as a mode of any other identifiable "this so-and-so". This man or Socrates satisfies both the conditions for being a substance: it is both identifiable as a "what"—an individual instance of man—and has a separate or independent existence, is not a way-of-being dependent on the modification of any other thing. In short, substances are the class of *particular whatnesses* or ways-of-being that do not depend for their existence on being modifications of any other thing or way-of-being.

Thus Socrates is a primary substance *both* because he is an instance

of the identifiable universal way-of-being man (unlike a heap of bricks, which is not an instance of a universal way-of-being at all), *and* because the way-of-being which is a man does not depend for its existence on the modification of any other thing or way-of-being (unlike an instance of paleness which depends for its existence on being a mode of *some* other thing). An instance of paleness depends, in a way that an instance of man does not, on there being *some* other thing—for example, this man or Socrates—which is pale; logically there cannot be an unattached instance of paleness without a subject which is pale; there can logically be unattached instances of Socrates.

Primary substances are compounded of two elements,

(a') matter (*hylē*)

(b') form (*eidōs, morphē*).

By "matter" here is meant something more general than the physical stuff out of which it is made; what is meant by "matter" is whatever it is that takes on a certain determinate form, which thereby turns a "this" into a "this so-and-so". The form of a thing is immaterial and structural, and it is what gives matter a determinate character as a certain kind of thing. The form is the structure or shape the matter has which makes it a determinate kind of individual or instance of a kind—rather as there might be two brass keys (they are of the same matter: brass), but only one fits my front door (they are of different forms: shape). So matter is that which is "informed" as an identifiable kind of thing, and form is that which makes some matter something of a certain kind: the whatness, or being-what-it-is, of each individual. In this sense any matter as such is *potential* substance, which is actualized as substance when it takes on a form and becomes a "this so-and-so". The meaning of "matter" here is not restricted to physical stuff: "matter" might be a man's general character that takes on the form "bad" so he has a "bad character".

The connection between the secondary substances and the forms—(2) and (b') above—is that secondary substances are instantiated in particular instances in matter as the form of that matter; the "so-and-so" of a "this", giving a separately existing individual, "this so-and-so" of a certain kind or sort. The form or essence is what all and only individuals sharing a common name and falling into a natural kind (marking a natural division in nature such as horse) have in common in virtue of which they are the kind of things they are. It perhaps helps to understand what is meant by matter taking on a determinate form, while also seeing that form is not a separate entity, to think of stone as a petrifying of matter, and of a horse as an equinizing of matter.

Matter and form are the logical parts of substance (apart from God who is pure actualized form); they always occur together and can be separated only in thought; we never find "prime matter" devoid of all specific determinations. Anything said of something posited as prime

matter would show it not to be prime, because the ability to talk about it and say what it is would necessarily involve saying that it has some specific characteristics or whatness. Prime matter is literally ineffable. Specific compounds of matter and form are in a hierarchy of matter and form; for what takes on a certain form will already have form at some level. For example, a lump of bronze is matter with the determinate form of bronze, and a bronze statue is matter with the determinate form of bronze taking on the form of a statue. The same bronze statue may be melted down and take on a new form, turning it into a bronze bowl. With the progressive addition of form to matter we can move “upward” from clay, to bricks, to walls, to house. That matter and form are logically distinct is shown by the fact that we can have the same form giving an instance of a kind of thing (a hammer) but different matter (some metal, some wood), and have the same matter (some metal) but a different form giving an instance of a kind of thing (a hammer, a chisel).

These distinctions allow Aristotle to give an account of change. He distinguishes two sorts of change:

- (a'') substantial change
- (b'') non-substantial change, or accidental change.

These mark the distinction between (a'') cases where a new kind of individual comes into being and (b'') cases where the same kind of individual thing persists in being through change. As a man moves from being young to being old we have a case of non-substantial change; the subject of change remains, through the change, the same individual or instance of what kind of thing it is: a man. But when a man dies, we have a case of substantial change—the individual becomes a different kind of thing. What it is is something else: a mere pile of flesh and bones. The form or essence of a thing *X* is a core set of properties *a*, *b*, *c*, which are together necessary and sufficient for *X* to be the kind of thing it is; that is, properties that jointly all and only things of kind *X* have that thereby determine what they are. What remains the same through substantial change (a'') is the matter (a') which has lost one form (b') and taken on another form. What remains constant through non-substantial change (b'') is the form (b') or essence, formulated in a definition, that gives those properties that make a thing the kind of thing it is.

Another way of looking at this analysis of change is to make the distinction between the *essential* properties ((2) above) of things and the *accidental* properties ((3) above) of things; so these correspond to the secondary substances and the non-substances respectively. The essential properties are those properties that remain the same through accidental change whereby an individual remains in existence as the same kind of thing or what it is. Essential properties are the properties which are necessary and sufficient for an individual to continue to be

an individual of a certain kind. The essential properties are given by the true or real definition of the term designating the kind of thing an individual is: so something is of kind *X* if, and only if, it has properties *a, b, c*; and this is the same as giving its form. The form of a thing is its essence given by a real definition, and this remains the same through accidental change. Thus a man can be hairy and go bald; he can change his blue shirt for a green shirt; but he still remains a *man*, since hairiness is not part of the definition of man. What is part of the essence of a man, given by the real definition of man, is the set of properties common to all and only individual men that makes it correct to include them under the term "man". Thus the real definition of man, revealing his essential nature, may be "mortal animal capable of discourse", which is definition by genus (animal) and difference by species (capable of discourse). The essential nature, or form, of a determinate kind is the residue of features which remain after the differences between individuals of the same kind have been removed, and we are left with a set of properties that all and only individuals of that kind have in common; in that way we say what some thing is.

How individuals of the *same* natural kind are to be distinguished is a difficult question. They cannot be distinguished by their kind, since that is common to them. One suggestion is that they are distinguished by their parcels of matter, which will be different parcels in each individual. Another suggestion is that we should admit *individual* essences as well as essences *by kind*. Later philosophers have said that only a complete enumeration of attributes of a given individual, denying any distinction between those that are essential and those that are accidental, can give a satisfactory principle of individuation. Generally it is held that, for a principle of individuation to guarantee unique reference, some appeal to space, time and motion is required.

To complete Aristotle's analysis of the nature of change, we have to make the distinction between "actuality" and "potentiality". When matter takes on a certain form, there is contained within the nature of the form not only what the actual form is at any given time, but also the potential further actualizations. For example, an acorn has a certain determinate actuality (actual state) at any given time; but it is also potentially an oak tree. Thus a complete characterization of the form of a thing—determining what kind of thing it is—will include a description of various progressive stages of actualization, and the full actualization towards which that kind of thing aims, which it contains only potentially until it reaches that end point. So a specimen of a certain kind will be a compound of matter and form, and the form will include what is actualized at any given time, plus its future potential states. This process is particularly obvious in the case of a living organism; but what it means in the case of non-living things is less clear. The point to be noted is that the form limits the way that a particular kind of thing goes on; acorns do not develop into horses, but have a

certain natural course of development. An eye that is blind suffers from "privation", because it is not actualizing its potential; whereas to say that a tree cannot see is not to say it suffers from privation, since to actualize seeing is not a potential part of the form of a tree.

Natural kinds are divisions of nature herself, not divisions imposed arbitrarily by us in language; the divisions are discovered, not created. How many different natural kinds there are is a difficult question for Aristotle, and his answers are not always consistent, (i) The criterion sometimes emphasized for natural kinds is that they are those things that persist through change. In this case it seems to make sense to include artefacts like beds in the list of kinds; a bed remains a bed after it has been painted green instead of blue. (ii) At other times the criterion emphasized is that of independence from external causes. Thus sometimes Aristotle includes in the natural world only things which can reproduce themselves "after their kind": horses naturally beget other horses, whereas if you plant a bed, you do not get another bed produced, it has to be made. Also bits of stuff like pieces of wood are excluded from the list of natural kinds since they are indeterminate—they are subject to destruction by degree; whereas it makes no sense to say of a horse that it is more or less a horse—it is either a horse or not a horse.

The explanation of change is, however, sometimes very unclear. This is partly due to difficulties as to what natural kinds there actually are. It is also due to the obscurity of the distinction between essential and accidental properties. This produces the problem of distinguishing substantial from accidental change. If, for example, we have a change of property from f to g , it may not be clear if it is correct to say, " Xf has become Xg " (an accidental change), or if it is correct to say, " Xf has become Yg " (a substantial change). If sweet wine turns sour, it is unclear whether it is correct to say that the sweet wine has become sour wine (an accidental change), or that the wine has become vinegar (a substantial change). How are we to distinguish a change in substance, a change from "this so-and-so" to a different "this so-and-so", from a merely accidental change in the same "this so-and-so"? There is a danger that if the number of instances of secondary substances increases, the explanatory power of explanations which depend on referring to the kind of thing something is will be diminished. If, at the limit, every change of properties involved a change in kind, then we would be unable to explain the change in terms of its being a consequence of the properties of the constant kind of thing in question developing in its natural ways, according to its form or nature.

The point that this talk of natural kinds is leading to is that the explanation for why a thing is as it is can be derived from discovering the kind of thing that it is and its connection with more general natural kinds of things. The form of a thing is an *intelligible* form; it is

ultimately perceived not by the senses, but by the intellect or reason—by *intellectual intuition (nous)*. It is this reference to the kinds or sorts of things there are in the world that is the basis for scientific knowledge and explanations of the world.

Knowledge is knowledge of “causes”, and Aristotle gives four senses to the notion of “cause”. It is important to see that “cause” here has a wider connotation than our mechanical notion, and none of Aristotle’s four senses really matches our use of the concept. When he is referring to understanding the causes of things, he is concerned with providing an answer to a “why” question: “Why is X as it is?” There are various ways of answering this question through different “because”. This is not at all mysterious if we consider the way we use non-mechanical explanations every day. Question: “Why was Durham Cathedral built?” Answer: “Because people wanted to praise God.” So Aristotle distinguishes four “because” answering “Why is X as it is?”:

- (a) Material
- (b) Formal
- (c) Efficient
- (d) Final or Teleological

The (a) here refers to the matter or stuff (not necessarily physical stuff) out of which X is made. (b) refers to what kind of thing X is; it is a “so-and-so”. (c) refers to the agent (not what the agent does) that brings X about. (d) refers to what X is for, or what its goal or end state will be; what its purpose is. If we take the case of a house, we can see that (a) is the bricks out of which it is made; (b) is the kind of house it is (Victorian style terrace); (c) is the men who built it; (d) points to its purpose of providing shelter. It should be noted with reference to (c) that causal links, or “because”, hold for Aristotle not between events, but between things. Taken together, these four causes provide a complete explanation for why X is as it is.

In the case of things with final causes, the formal and final causes will be closely linked; in giving the form of something, it will be necessary to refer in a definition to what that something is for. The use of form and function in explanations allows us to see why something can remain the same thing, even when certain changes are made to it. If a green bed is painted blue, it remains the same as an individual instance of *bed*, in that its form and final “because” are unchanged. We can plainly see that formal and final explanations are more obviously applicable to artefacts and living organisms than to inanimate objects. Aristotle suggests that stones fall down because their natural place—their natural final state spelt out in their form or essence—is as near to the earth as possible. But we would hardly regard this explanation as satisfactory today. There is the danger that explanations derived from the kind of thing X is in this way become uninformative and lead us to fail to seek the real internal causal

mechanisms that bring about a specific change. We have not identifying the object before us as a clock. The explanations are at risk of being uninformative because they become tautological: *X* is as it is because of the real definition of *X*, and any counter-evidence is immediately excluded because if a putative *X* is found to act in a way contrary to its definition then it is not a case of *X* at all. We cannot define a thing if we exclude its causal powers; we thereby risk circular explanations if causal consequences are deduced from definitions.

All substantial change involves matter taking on a new form, which is, in some way, passed on from an agent. In the case of a house, the efficient cause operates by the form of the house that exists as an idea in the mind of the builder being passed on to the matter of the house. In the case of natural objects, the efficient cause is the natural parent in which the form of the offspring is latent. This logically rules out both creation from nothing—where there is no matter—and any possibility of Darwinian evolution of the kinds of things there are, since the forms manifested in natural kinds do not change in themselves. God is the supreme source of all change; He transcends the world as pure form devoid of matter, fully actualized, possessing no potential. God is not the creator of the world out of nothing, but the “unmoved mover” in the sense of a final cause which is the ultimate cause of whatever form the world has.

Knowledge proper requires that its objects must be both really existing, and eternal and unchanging. If nothing in the sensible world is eternal and unchanging, then it follows that knowledge of the sensible world is not possible. If it is also the case that the sensible world is the only really existing world, then knowledge is not possible at all. If knowledge is possible, but it is accepted that the sensible world is not eternal and unchanging, then knowledge must be of a really existing transcendent supersensible world of eternal and unchanging objects: the Forms or essences of Plato. If knowledge is possible, but it is accepted that the sensible world is the only real world, then knowledge must be of really existing eternal and unchanging features of the sensible world: the forms or real kinds of Aristotle. That is, if knowledge proper is possible, it must be the case either that there is a world of eternal and unchanging real objects beyond the sensible world (the position of Plato), or that there are eternal and unchanging real features of the sensible world (the position of Aristotle).

Aristotle holds that there is something about the sensible world that is eternal and unchanging and graspable ultimately by the *intellect* and is a suitable object for scientific knowledge: the natural kinds of things there are and the relations between them. These natural kinds are objective really existing features of the world, not mere arbitrary conventional classifications imposed by us. The common-sense view of the world is that it divides itself up into many distinct kinds or sorts of individuals; and we have knowledge proper or scientific knowledge

(*epistēmē*), as opposed to mere belief or opinion (*doxa*), of those individuals through knowing the kind of thing an individual is. It is natural or real kinds that are the proper objects of knowledge.

Aristotle made great contributions to logic, which he sees as the tool (*organon*) of philosophy. Through the notion of the syllogism he sought to identify all the valid forms of deductive reasoning. In fact there are other forms of deductive reasoning that Aristotle does not consider. Deductive logic is a vital tool of philosophy, and of inquiry generally, in providing a way to get infallibly from true premises to true conclusions. If the premises are true in a valid deductive argument, then we know that it must be the case that the conclusion is true. Aristotle introduced the important notion of variables—letters such as *A*, *B*, and *C*—to stand for classes of things; this reveals that deductive arguments are valid or invalid regardless of their content and in virtue of their argument-form. For example:

All *As* are *Bs*.

All *Bs* are *Cs*.

All *As* are *Cs*.

This is a valid argument-form: an inference which would be valid regardless of what classes of things are substituted for *A*, *B*, *C*.

Aristotle ideally sees knowledge as forming a system that is a deductively connected body of truths. Scientific knowledge is knowledge of causes: giving the reason why *X* is as it is, and must be as it is. We have first to know what kind of thing *X* is, and then to show why, given the kind of thing it is, *X* must be as it is. Thus knowledge of some truth about *X* would consist of deducing the truth about *X* from premises which we know are true, thereby proving by a valid deductive argument that what we say is true about *X* is necessarily true of *X*.

Aristotle was aware of an important problem connected with this: *all* knowledge cannot be a matter of providing a deductive proof or demonstration, because this leads to an infinite regress of proofs: any premises we suggested would themselves stand in need of further proof. If the regress is infinite, then nothing can actually be proved, and nothing therefore known. This leads Aristotle to the view that there must be self-evident first principles or axioms that can be known *immediately* by intellectual intuition (*nous*), which neither require nor are capable of proof. The most general and firmest of these principles is the law of non-contradiction, which in the *Metaphysics* Aristotle states thus: "For the same thing to hold good and not to hold good simultaneously of the same thing and in the same respect is impossible." This can also be expressed in a more modern way: "It is not the case that both *p* and not-*p*", where *p* can be any proposition. This principle is presupposed in all rational thought; thus any attempt to prove it by rational thought is hopelessly circular. We can, however,

prove it by rational thought is hopelessly circular. We can, however, simply see intrinsically that it is a true principle.

Ideally the deductions of science would take place from the most fundamental first principles; but, in fact, this is not possible; science cannot proceed purely *a priori*, independently of experience, because the most general first principles are too general for studying particular kinds of things. The deductions of science are based on real forms (the essences, real natures) of things and true universal principles (all *As* are *Bs*) connecting these forms; and the process of apprehending both of these is initiated by induction. We observe by sense-perception many particulars of the same kind, and through reason or intellectual intuition (*nous*) we “perceive” the form or essence of that kind of thing as a real definition or concept given by genus and difference. We then form a hierarchy of different degrees of generality, of kinds of things, descending to *infima speciei*: those specific kinds of things below which there are no further kinds, but only individuals of a specific kind. Such a species would be man, and above it, and including man, is the genus animal. We also derive in the same way, by sense-perception and intellectual intuition, universal principles logically connecting the forms or essences. We are able to have knowledge proper since, by taking the forms and universal principles together, we are able to deduce universal certain necessary truths about the kind of things we are interested in.

In this way it is shown why things are as they are, and why they must be as they are, and not otherwise. If a certain truth about the world is the conclusion of a valid deductive argument whose premises we know to be true, we have shown: (a) why that conclusion is a truth, because it follows logically from known premises, and (b) that the conclusion is a universal necessary truth, in virtue of the argument being deductive. To follow a valid deductive argument from true premises is to follow a causal connection in the world. We explain some feature of the world by deducing it from the definition of the kind of thing it is and from principles universally true of a general kind of which it is a part.

We might ask why *X* is *f*. If we know the kind of thing *X* is—it is of kind *Y*—and the universal principle that “all *Ys* are *f*”, then we can deduce and explain, why *X* must be *f*.

An *X* is a *Y*.

All *Ys* are *f*.

All *Xs* are *f*.

For example: “Why does a horse suckle its young?”

A horse is a mammal.

All mammals suckle their young.

All horses suckle their young.

The principle in the second line is what science seeks to use in explanations, and it is known only by inductive observation of many animals combined with the use of reason or the intellect. The first line is known in the same way.

Science—knowledge in its highest sense—deals with universal eternal necessary truths, not with particulars as particulars. The forms or essences of kinds of things, and the universal principles derived from the connection of those forms or essences, are the real eternal unchanging intelligible aspects of the world. For science to study what is real there must be kinds or sorts of things that mark real, objective, fixed cleavages in the world, which are not the imposition of human conventional classification. That they are real is an assumption Aristotle makes on the basis of our common-sense ways of talking about the world. Our explanations derive from the ways that the vast plurality of things of certain real kinds behave, given that their forms or essential natures determine the kinds they fall into. The positing of such fixed intelligible forms is what makes a scientific knowledge of nature possible, in the sense of knowing universal necessary truths about universal necessary features of the world. Scientific knowledge gives deductive proof that specific kinds of things are necessarily as they are. The common principles of all reasoning, plus known universal principles, plus knowledge of the kind of specimen we have before us, together enable us to prove necessary truths about that specimen. It is possible for us to have scientific knowledge of the world, since the world can be understood according to general principles and real definitions which do not alter and are eternal, and which the intellect can apprehend.

It must be noted that this means that science can deal with particulars only in so far as it considers them instances of universals; it considers only objective universal properties common to all and only particulars of the same kind. Science is concerned not with what makes a thing particular, but with what makes it an instance of a general kind. Science can have as its object only genera, species or universals—the specific defining form that individuals share—and not particulars as such. Individuals are in the scientific sense unknowable; in their unique particularity they are perhaps ineffable, since to talk of them at all is to use common classifying terms which apply to other individuals.

While we might grant that the proper principles or laws that science aims to discover are *universal* in application, we do not thereby have to agree they are *necessary*. The inductive inferences as envisioned by Aristotle to derive general principles concerning kinds of things would at best be known to be universally true. Even this is clearly not possible if the number of kinds in the class to be investigated is infinite. However, Aristotle thinks that such induction

produces evidence supporting universal *necessary* truths which intellectual intuition apprehends as necessary. The problem is that this tends to confuse contingent universal truths—which might be supported, if not conclusively, by experience—with necessary universal truths which are necessary just because their truth is independent of all experience and which rely for their necessity only on logic and the meaning of their terms. Aristotle relies on the justification of intellectual perception—going beyond the limited possibilities of experience—to establish finally the features of the inmost nature or essence of things, the correctness of our real definitions of those things, and the necessity of principles. But it is not clear that an account of there being necessary truths depends on the subjective intuitive self-evidence of some truths, rather than on the purely objective logical form of such truths, such as the denial of a necessary truth implying a contradiction. Moreover, if the necessity of a truth is entirely a result of its denial implying a contradiction, then it does not say anything about an actual world if the nature of that world is not logically necessary but contingent; then truths about that world cannot be known to be true merely by showing that their denial implies a logical contradiction, because none of them does.

Plato and Aristotle think that science should attain knowledge of universal necessary truths. Aristotle thinks we can have scientific knowledge of the sensible world because eternal unchanging forms are immanent in the world of sensible objects. The sensible world thus has two aspects: its sensible aspect, and its intelligible aspect (the forms), and we can, through the intelligible aspect, know necessary truths about the sensible world. That such provable universal necessary truths—propositions whose falsity is impossible—are restricted to mathematics and logic is now something generally accepted to be the case. Plato, we might say, was more aware of this point in thinking that if knowledge (*epistēmē*) of necessary truths were possible it must be of a supersensible world, not of the empirical world. Plato thinks that the universal necessity of the truths of highest forms of knowledge depends upon their being about eternal transcendent supersensible objects beyond the natural world: Forms, essences, or objective concepts. Whether such realism is required to account for knowledge of universal necessary truths is certainly disputable. It might be possible to account for necessary truths without saying that they are about any world of real objects at all, perhaps by saying that they are merely those propositions whose denial implies a contradiction. Plato disagreed with Aristotle who thought that knowledge, even in the highest sense of knowledge of universal necessary truths, must be about aspects of the world of sensible or empirical objects. The point at issue here is whether there is such a thing as natural necessity: whether there are necessary

features and connections in the natural world expressible in necessary truths, or whether such necessity is restricted to logical truths which say nothing about the natural world, although they may say something about a world of real objects apprehended by pure intellectual thought beyond the natural world.

CHAPTER THREE

Medieval philosophy: Augustine, Aquinas, Ockham

In thinking of medieval philosophy, we must consider that we are covering a vast time of around a thousand years including St Augustine of Hippo (AD 354–430) and William of Ockham (c.1285–1349) and extending until at least the time of the Renaissance. What links the diversity of this period in Western philosophy is the rise to dominance of Christian beliefs.

It would be wrong to conclude that thinkers in the medieval period merely slavishly reiterated Christian dogma. There exists a tension in medieval philosophy between reason and faith (from the Latin *fidere*, to trust). The distinction, if there is admitted to be one at all, between the reason of philosophy and the faith of theology is that between, respectively, the insights of natural knowledge derived from the natural cognitive powers of the intellect and senses, and the insights of supernatural knowledge derived from divine revelation. The distinction between philosophy and theology in the Middle Ages was often not clear; generally it can be said that whereas philosophy embodied rational arguments based on premises derivable from naturally occurring powers of thought and the logical working out of those premises (particularly from the philosophers of the ancient world, especially Aristotle), theological arguments were based on divine Christian premises derived from God—in particular from the Bible and the opinions of the Church Fathers as collected in Peter Lombard (c.1100–60), *Four books of sentences*. Christian thought insisted that reason must succumb to the deliverances of faith or religious belief where the two are irreconcilable.

It is characteristic of the dominant intellectual framework of the scholars of the universities of the medieval period—called scholasticism—to try to reconcile the demands of rational philosophy and the demands of theological faith. The dissolution of scholasticism at the end of the Middle Ages really amounts to the increasing triumph of reason over faith; instead of Christian faith being the standard by

which rational arguments were to be judged, arguments were increasingly followed wherever they led. Reason in scholasticism was often used as a tool for supporting and deepening the understanding of what was already believed to be true as a matter of religious faith. After all, it is reasonable to suppose that even if some true beliefs are accepted as true without sufficient argument, it might still be possible to provide a rational justification for those true beliefs.

It was also thought that some truths were beyond the reach of rational demonstration, but that this was not detrimental to these truths, since their acceptance depended on religious faith. Belief in truths of faith influenced rational arguments by affecting the premises considered, and by judging the truth of the conclusions reached. If a valid argument leads to a conclusion which is false—false, in this case, according to religious faith—we know that at least one of the premises must be false. However, the strain of combining reason and faith eventually led to the separation of philosophy and theology; the attempt had been made to fit philosophy in as a rational, but limited, path to religious truth, but in the end it tended to undermine the body of theological dogma.

The source of medieval theological doctrine was the Bible and the Church Fathers; the problem presented to medieval thinkers was how to reconcile beliefs from these sources with the beliefs and logical arguments derived from Plato and Aristotle, and the attempts of Arabic and Jewish thinkers from the tenth century to the twelfth century to combine Plato and Aristotle. This reflects the high opinion which was held of work from the ancient world; throughout the medieval period, ancient philosophy was a source of authority which toward the end of the period was used to oppose new arguments in philosophy and science. Nearly all medieval philosophical literature takes the form of either commentaries on previous works (especially Aristotle), or disputes (*quaestio disputata*), where a question would be raised and opposing solutions and objections considered and eventually reconciled.

During the period from the second century to the fifth century AD, while the Roman Empire remained intact, Platonism and Neoplatonism had the upper hand in Christian thought; this is apparent in the works of St Augustine. The greatest Neoplatonists were Plotinus (AD 205–270), his disciple Porphyry (AD 233–304), and later Proclus (c. AD 410–485). St Augustine adopted, but profoundly modified, Platonism in the service of Christianity, to which he converted in AD 386 at the age of thirty-two. But with the break-up of the Roman Empire in the fifth century, Western Europe and the eastern parts became separated, and from the sixth century to the eleventh century we enter the Dark Ages.

During the Dark Ages nearly all serious intellectual activity ceased in Western Europe, although it continued in the eastern provinces

conquered by the Arabs. From the fifth century onwards little of Plato was known directly in Western Europe, and the full corpus of his works did not re-emerge until the end of the Middle Ages; apart from in the work of John Scotus Erigena (c.810–c.877) Neoplatonism as such was also not rediscovered until the late twelfth and thirteenth centuries, but its influence seeped in from around the fifth century from the Arabs and the works of Pseudo-Dionysius, who was falsely thought to be the Athenian converted by St Paul. Only the works of Aristotle on logic remained known throughout the Middle Ages, thanks largely to translations and commentaries by the Roman philosopher Boethius (c. AD 480–524); but in the latter part of the twelfth century other works of Aristotle were rediscovered, revealing the ambitious system of metaphysics, science, and ethics.

In contrast to the period before the lacuna of the Dark Ages, after that period it was Aristotelian philosophy, rather than Platonic philosophy, which dominated Western European thinking. It was during the period from the twelfth century to the fourteenth century that the tensions between reason and faith intensified, and this gave way to the progressive weakening, from the fourteenth century, of the scholastic attempts to harmonize the two. The spread of new ideas continued, aided by the invention of printing in the fifteenth century. Intellectual changes were matched by the disintegration of the medieval social order; the increased disrespect for ecclesiastical authority and the rise of the rival power of the nation state undermined the unity of Christendom. The door was open for the Protestant Reformation of the sixteenth century and the greater importance of the conscience of the individual and direct understanding of Christianity. Philosophy became increasingly autonomous after the fourteenth century, and the gap between philosophy and theology was never again closed. By the end of the medieval period both Christianity and Aristotelianism, as the authoritative storehouses of correct opinions, were being replaced by a different vision of intellectual and moral advancement in the light of new philosophical and scientific ideas.

Given such a long period as the Middle Ages, it is unsurprising that it is possible here to make only a small selection of its thinkers. Apart from the thinkers discussed, among other important figures are Abelard (1079–1142), St Anselm (1033–1109), St Bonaventure (1221–74) and Duns Scotus (c.1266–1308). Augustine, Aquinas and Ockham are chosen here as representative of different important aspects of the period; they might be said to embody respectively medieval philosophy's inception, its consolidation, and the beginning of its dissolution. Their views on the place of reason and faith can roughly be summarized as follows: for Augustine there is no fundamental distinction because reason depends on divine help to grasp eternal truths; for Aquinas there is a distinction on the basis of the natural and

the divine but the two are complementary and to a degree overlapping; for Ockham reason and faith are distinct and have no overlap.

Augustine

Augustine (AD 354–430) was born in Thagaste and died in Hippo, both places in North Africa. Intellectually he straddles the gap between the philosophers of ancient Greece and those of medieval Christian Europe; he lived through the decline of the Roman Empire, which led to the Dark Ages. The eventual historical outcome in the eleventh century was the increased dominance of Christianity. Augustine's mother, Monica, was a Christian, but initially he did not accept the faith and adopted Manichaeism, which embodied some elements of Christianity among elements from other religions. At the age of seventeen he became a student of the University of Carthage where he became a teacher of rhetoric and, while there, lived a life of extravagant pleasure—including sexual pleasure—which was to contrast starkly with his later monkish life. In AD 383 he moved to teach in Rome; following financial problems, he accepted a teaching post in Milan, where he greatly augmented his knowledge of ancient Greek philosophy, in particular Neoplatonism. In Milan he was impressed by the teachings of Ambrose, Bishop of Milan.

Augustine converted to Christianity in AD 386, and was baptized the following year. He was then determined to enter the Church and renounced worldly pleasures. Initially Augustine found no difficulty in reconciling the dominant intellectual position of his day, Neoplatonism, with the demands of Christian scripture; later he began to see greater problems in reconciling their basic concepts. He soon founded his own monastic community in Thagaste; but this lasted only a couple of years through his being forced into the Catholic priesthood. Augustine eventually became Bishop of Hippo in AD 396. He never left North Africa for the last thirty-nine years of his life. In AD 410, Rome was sacked by the Goths; in 429 the Vandals crossed to North Africa from Spain and laid siege to Hippo; Augustine died in 430, aged seventy-five, a short time before Hippo fell.

The character of Augustine's thought is distinctly religious, rather than purely philosophical; the discussion of certain philosophical problems is not that of the disinterested academic, but has the overriding purpose of identifying the path to the attainment of blessedness or beatitude. This does not mean that what is true is crudely identified with whatever makes one happy; it is rather the other way around: knowledge of truths will make one happy. It is assumed that the wise man and the happy man are one, and knowledge of truths is part of the attainment of wisdom. The question

of whether we can know truths is generally assumed to be answered positively; the chief question is how we can attain that knowledge. The overall religious purpose is twofold: first, to show how we can become closer to God; secondly, to emphasize the importance of God by showing how everything is closely dependent on God.

A problem of particular concern to Augustine is how we come to know the universal necessary eternal truths described by Plato and the Neoplatonists. First, however, Augustine sets about demolishing the sceptic who asserts that no knowledge at all is possible. He points to a range of things we clearly know to be true, which the sceptic cannot possibly deny. He is not aiming to use these known truths as the axiomatic foundation of the rest of knowledge, rather, if any of the examples are admitted as known truths, then knowledge is possible, and the absolute sceptic refuted.

- (a) We know the law of non-contradiction, whereby if something is true, it cannot also be the case at the same time that the opposite is true.
- (b) I know that I exist. "If I err, I exist" ("*Si fallor, sum*"). This anticipates Descartes' *cogito*; but it is not used in the same way; Augustine is not concerned to use it to prove the existence of the external world.
- (c) Appearances cannot in themselves be false; I know infallibly what my subjective experiences are, how things appear to me: my "seemings". I can know infallibly what *seems* to be the case; it is my judgement, which goes beyond what seems to be the case, which introduces the possibility of falsehoods.
- (d) We clearly, even from the sceptic's point of view, have the capacity to doubt; so we know at least one truth: there is doubting.
- (e) We obviously know with certainty mathematical and geometrical truths.
- (f) We do not just know abstract principles, we also know real existences. We know that we exist, that we are alive, and that we understand these facts. Augustine points out that even if our experience is really a dream, we nevertheless still know we were alive. We are also conscious that we will certain things.

These bulwarks against scepticism are in one way or another derived from introspection independently of the errors of the senses.

Augustine does not dismiss the senses as wholly deceptive. From the fact that we can sometimes err in our sense-based judgements (for example if we judge that a stick which appears bent in the water really is bent), and can on any particular occasion err, it does not follow that the senses cannot ever support true beliefs. That the senses deliver truths less certain than those of mathematics does not mean the senses do not deliver truths at all. However, Augustine supports the Platonic

view that the lack of certainty and the relativity of judgement (the same thing can appear different to different people) that beset the senses make the objects of sense not suitable objects for true knowledge or knowledge proper. The true objects of knowledge—the truths we can know with greatest certainty—are truths that are universal, necessary, and eternal; this is the highest form of knowledge, and sensory knowledge the lowest. This means that these eternal truths have to be found within the mind independently of sensory experience.

The problem arises of how eternal truths and our knowledge of eternal truths are to be accounted for. The sensible world does not provide us with the required immutable concepts and truths; the human mind or soul, although immortal, is also temporal and mutable. Augustine agrees with Plato that, just as transient truths are accounted for by the mutable objects of the sensible world, so universal necessary eternal truths are accounted for by their being truths about eternal and immutable real objects. Moreover, these eternal objects, and the truths concerning the relations of the concepts of these objects, are independent of the human mind; they are truths that we discover, which we cannot alter, and which are thereby objective and common to all capable of reasoning. Such objects—immaterial impersonal essences—referred to by Plato as Forms, are identified by Augustine as ideas in the eternal, immutable mind of God—they are the content of the divine mind. Such divine ideas provide both truly objective fixed concepts and necessary truths by being the objects of necessary judgements. Augustine, like Plato, has no facility to account for the necessity of some truths which does not involve realism, requiring there to be eternal objects to which those truths correspond; he is unable to account for such necessary truths merely on the basis of the logical relations between concepts, but thinks that such truths require eternal objects which the eternal truths are true of eternally.

Such necessary truths are available to us in the areas of mathematics and geometry, but they are also possible in moral and aesthetic judgements. The divine ideas provide perfect objects for the concepts of number and geometrical forms; they also provide objective standards for moral judgements concerning good and evil, and aesthetic judgements concerning what is, or is not, beautiful. We do not find perfect unity in our experience (we always find things with parts which are thereby both one and many); we do not find absolute goodness or evil or perfect beauty in our experience. We do not find these things in themselves exemplified in the sensible world; but nor are they mere constructions of the human mind. Rather, the divine ideas in God's mind are the absolute eternal standards by which all else is judged, and which are assumed in our judgements.

The problem remains of how such eternal truths are accessible to the non-eternal human mind. We have certainly been granted reason by

which we are able to form true or false judgements not derivable from sense-experience. But reason alone is not enough to account for our knowledge of eternal truths. The human mind, in seeking eternal truths, is seeking something beyond, and superior to, the mutable and temporal mind, and to know such truths we need help. Such help emanates from God in the form of "divine illumination"; and as an illuminator God is present in us as He is present in all things. All knowledge in Augustine is seen as a form of seeing. Just as the senses see independent objects when they are illuminated by the sun, so reason or intellect "sees" eternal truths when illuminated by the divine light. This does not mean that in apprehending eternal truths we have direct access to God's nature—that is possible only after death, if at all. We do not intellectually see God or the mind of God when we know eternal truths. It is unclear whether the illumination implants the concepts constituting necessary truths in our minds, or whether it simply enables us to recognize which judgements are eternal and necessary—it could indeed function in both ways. Perhaps the best interpretation is to say that God does not directly infuse our minds with the absolute concepts which constitute eternal truths, rather such concepts are latent in the mind as copies of the archetypes in God's mind; divine illumination enables us to see intellectually which are the eternal and necessary truths that are latent in our souls, and so to recognize them as eternal and necessary. The latent concepts, and the eternal truths connecting them, are in *memoria*; in this way ideas can be in the mind without the mind being aware of those ideas. This accords with our use of "memory" only in that it refers to ideas that can be in the mind without our being always aware of them; it refers in Augustine, most importantly, to the *a priori* content of minds, which is not literally a remembrance of things past. Nevertheless the theory is close to Plato's account of our possessing *a priori* knowledge through reminiscence.

Eternal truths are, of course, independent of and irrefutable by sense-experience. So the true objects of knowledge are objective eternal objects which depend on there being ontologically appropriate eternal objects in the divine mind. Knowledge of eternal truths is granted by a combination of natural human reason and supernatural divine illumination. To benefit from such illumination we have to turn towards God. This precludes the possibility of making a distinction between natural reason and divine faith, for both are always needed and mixed in the search for knowledge. This again emphasizes the dependence of all things on God, in this case our capacity to know eternal necessary truths.

The immateriality of the soul and its superiority to the body mean that Augustine has great difficulty accounting for perceptions through the corporeal organs. The superior nature of the soul's mode of existence involves the view that it cannot be affected by the inferior

corporeal organs. At first he suggests that the mind uses the sense organs as a tool. Later he tries to account for our awareness of changes in our corporeal senses by the mind attending to or noticing such changes; but it is difficult to see how, in this case, some causal influence of the corporeal sense organs on the mind can be avoided.

Augustine uses the existence of eternal truths as proof of the existence of God. Leibniz in the seventeenth century presents a similar argument. The argument starts by getting one to admit that there are eternal truths—immutable necessary truths, forced on human beings. The only way to account for there being such necessary inescapable truths is their objective existence as truths in an eternal mind. We serve and are closer to God in so far as we contemplate eternal ideas in the mind of God. This, however, is not all that is required; we also need a spiritual purification—goodness—in order to approach God.

Aquinas

Thomas Aquinas (1225–74) was born of a noble family at Roccasecca, Italy. From the age of five he began studying at the Benedictine abbey of Monte Cassino. In 1239 he went on to the University of Naples, where he studied the seven liberal arts of grammar, logic, rhetoric, arithmetic, geometry, music, and astronomy; while at Naples he entered the Dominican Order. His entry into this Order, with its emphasis on poverty and evangelism, was opposed by his family to such an extent that he felt the need to escape to Paris; but while on the road to Paris, he was abducted by his elder brother and locked up in the family castle at Monte San Giovanni. He was later held prisoner in Roccasecca for over a year. His family was unable either to strip him literally of his Dominican robes, or to persuade him to renounce the Order. While he was imprisoned his brothers sent him a seductress; but he drove her from the room with a burning brand, and the event merely reinforced his commitment to chastity. Eventually his family relented and he returned to the Dominican Order, first at the University of Paris in 1248, then at Cologne under Albert the Great. During this time he became deeply versed in the works of Aristotle.

He returned to Paris in 1252 for advanced study, and he lectured there in theology until 1259. The next ten years of his life were spent at various Dominican monasteries near Rome; in 1268 he returned to teach again at the University of Paris. In 1272 he went to teach at the University of Naples; but ill-health forced him to stop work. In 1273 he had a mystical vision which caused him to regard his intellectual work as worthless—he consequently ceased work on the massive *Summa theologiae*. In 1274 he was journeying to Lyon for a meeting of the

church council, but had to rest at Fossanova, not far from his place of birth, owing to illness; there he died in 1274.

Aquinas' character seems to have been one of imperturbability, and there is no doubting his sharpness of intellect. After his death the teaching of Aquinas and Thomism formed the official doctrine of the Dominicans, and this was adopted by some other Orders, but it was in general relatively neglected by the Catholic Church. However, in the nineteenth century Aquinas was commended by Pope Pius IX as the premier figure of Catholic philosophy and theology.

Aquinas' thought owes a great deal to Aristotle, and he attempts to reconcile the central tenets of Aristotelian philosophy with Christian dogma; these attempts deal with issues like the nature of God, our means to salvation, and our understanding of the nature of creation. Aquinas' thought begins with the presupposition that the universe is, at least partly, intelligible to finite human intellects: the structures and laws of the universe can be understood.

Aquinas hatches a compromise between the conclusions derived from our natural cognitive faculties (the senses and reason of secular philosophy), and conclusions derived from divine revelation (the faith of divine theology). One could dismiss one or the other as worthless, or say that each one ultimately depends on the other, as Augustine does; Aquinas however maintains the distinction, and says that they are two generally autonomous ways of looking at the same object, namely God. Whereas our natural cognition works "from below" to know God through His effects as the creator of the world, divine revelation—supernatural cognition—works "from above" to know God as cause. Thus faith (*fides*) and scientific knowledge (*scientia*) are sharply distinguished not by object, but by method. Both are cognitive processes involving the assent of the intellect to truths; but whereas faith requires the addition of the will in order to believe truths with certainty, scientific knowledge requires no such application of will since the intellect either intuitively "sees" truths immediately, or argues validly to establish truths from intuitively known premises.

Within theology we can make a distinction between supernatural and natural theology: respectively, truths revealed about God and other elements of Christian doctrine which depend on divine revelation (grace, which derives from the Latin *gratia*, meaning favour), and those that can be known through natural powers of cognition. There is also an overlap of truths: some truths are both revealed and known through being provable by natural cognition. In this sense natural theology is part of supernatural theology. So the totality of truths grasped by the human mind has three parts.

- (A) That which is believed *only* in virtue of divine illumination or revelation.
- (B) That which is believed by divine revelation *and* is known by being provable by natural cognition.

(C) That which is known by natural cognition.

Ideally a conflict will never arise between the deliverances of the revelations of faith, and the proofs of natural reason; but in the latter we are fallible, and a conclusion derived from reasoning that conflicts irreconcilably with a properly understood truth of faith shows that we have made a mistake in our reasoning. But we have, ideally, a twofold route to some Christian truths.

Natural cognition is made up of the senses and the intellect, and of these the senses are primary both genetically and logically for knowledge of existing things and for possession of abstract ideas; all the materials of our intellectual faculty—our ideas—are abstracted ultimately from the senses. The intellect is involved in forming judgements about what we perceive: that what we perceive really exists, that it has certain properties and that it is a certain kind of thing. The intellect also engages in abstract reasoning. The senses see *X*; the intellect actively judges *X* as *X*; the intellect goes on to understand and think of *X* when it is not perceived. The intellect goes beyond the sensory experience in forming a judgement, which is an affirmation or denial of some truth; this goes beyond the mere fact of one's having a certain experience. The sensible aspects of particular things (red, sweet, warm, etc.) are given through sense-perception alone; but the intelligible aspects of particular things (that they exist, that they actually have certain properties and are certain kinds of things) are derived not from the passive association of the ideas of senses alone, but in conjunction with an active synthesizing and interpretative intellect, which forms from the ideas of sense complex conceptions and hypotheses. The intellect forms concepts—universal ideas—of things by abstracting general ideas from sense-experience; the intellect thinks of the nature of those things and how they are connected to other things by understanding those general concepts.

Aquinas follows Aristotle closely in not supposing that essences (the “whatness” of things) can exist apart from individual things; philosophically speaking, there is no *universale ante rem*, that is, essence before or apart from individual things; rather, essence is *universale in re*, present in individual things, in the sense that real things are real substances and are always compounded of two elements.

- (a) Essence (*essentia, quidditas, natura*). This is “whatness”; viewed epistemologically through a definition it tells us *what* a thing is.
- (b) Existence (*esse*, which is a form of the Latin verb “to be”; but *esse* is also used as a noun). This is the fact *that* a thing is.

The difference between a mere essence (*quidditas*) and real substance is existence (*esse*); existence is what turns, by being “added” to it, a merely potential essence into an actual individual substance. This is the primary move from potentiality to actuality: mere potential

existence to actual existence. Once a certain essence is actualized, there is a further process of change from potential to actualization as the essence brought into existence strives to fulfil its potential within its kind; an acorn (an actual acorn, but potential tree) will grow into a tree (an actual tree). The terms above in (a) and (b) roughly correlate with the following.

(a') potential (*potentia*, potency)

(b') actuality (*actus*, act).

The difference between essence and potentiality is partly one of generality; to speak of essence is to imply some determinate potentiality: a certain "so-and-so"; whereas to speak of potentiality is to suggest mere possibility: some "so-and-so" or other. Anything that is not logically impossible has potentiality in the second sense.

To know the *essence* of something is to know its real definition, the essential features without which a thing would cease to be the kind or sort of thing it is. The *accidental* features that an individual kind of thing has are those features which it can lose or gain while remaining the same kind of thing. It is most important to note that Aquinas thinks that in giving a definition of the essential nature of an individual, he is giving a *real* definition; that is, the definitions are not a function of the way we conceptually happen to divide up the world, rather the definitions, if true, reflect accurately the way the world divides itself up.

The distinction between essence and existence is also a *real* distinction. That is not to say we ever encounter in the world pure existence or pure essence, but the distinction is real in the sense of being independent of human cognition; it is not a distinction projected onto the world by the mind. For to say *what* something is is one thing, but to say *that* it is, is another; we can know what a dog is—the essence "dogness"—without committing ourselves to affirming either the existence or non-existence of dogs. Another way of putting this is to say that essences have no existential import. This is true for all entities except God; He alone has existence as part of His essence. For all other beings, existence (*esse*) is something added to essence—added to a mere determinate potentiality—by God; thus all things depend ultimately on God. Essence and existence are never found in separation; nothing simply *is*, a thing always is a *determinate kind* of thing; to be is to be a "so-and-so"; to be is always a determinate *way* of being. The obvious limitation of individual substances is explained by essences receiving *esse* and at the same time limiting that *esse* to a certain way of being. In God the *esse* is unlimited, and also eternal; there are no limits to God's being; He has "fullness of being".

For Aquinas as a Christian, unlike for Aristotle, the existence of things cannot be taken for granted but requires explanation. Aristotle thought that the world exists eternally, and that any change in the

world is not a change from absolute non-existence (nothing) to absolute existence or vice versa, but a change either of an accident, or from one form of substantial being to another. For example a substantial change occurs when a tree ceases to be a tree and becomes ash when it is burnt. For Aquinas the very fact of existence itself is a problem; given that nothing, except God, has existence as part of its essence, an explanation beyond the essences of things is required to explain why anything *is* at all; that explanation derives from God the creator who adds *esse* to essences.

Apart from God, no essence is fully actualized. In God's case, the positive essence is fully actualized. God does not merely actualize His divine essence; He actualizes it all the way, so to speak. If we take any other entity, we will always have an entity which has potential within its kind—its essence will not be fully actualized; there will be aspects of its essence that it does not fully exemplify. God's absolute perfection is to be identified with His complete actualization of His positive divine essence—He is pure act (*actus purus*); He contains no unactualized potential of His positive divine essence.

The relation between essence and existence, and between potency and actuality, applies to any substance whatsoever. It must not be supposed that all real substances must be material or corporeal; not only material things have *esse*. The analysis of material things introduces another pair of terms,

- (i) form (*morphe*)
- (ii) matter (*hyle*).

This gives a hylemorphic theory of material substance. In the case of material substances, potential corresponds to matter; the matter is potentially a "so-and-so", and is actualized as an individual separable thing of a certain kind by taking on a certain form; that form is actualized in that matter. However, pure matter (*materia prima*) would be completely ineffable; it would by definition possess no character, no whatness. Only by the addition of form in act in the matter does it become a determinate "so-and-so"; matter as a mere determinable is not possible, although we can understand what we mean when we talk of it. The notion of pure potentiality as pure matter is impossible as something that exists—it would indeed be a contradiction—but it is intelligible conceptually. Indeed, pure potentiality cannot in any case exist. The soul is the form of human beings; and souls are individuated by the matter of the body of which they are the soul. But pure forms can exist, as well as material substances, when certain non-material essences receive *esse*. What Aquinas has in mind here seems to be a three-level hierarchy of being.

- (1) Corporeal substances. These are matter and form; they are perishable and finite.

- (2) Incorporeal limited substances. These are pure form—spiritual entities, which although imperishable are finite. The kinds of entities Aquinas has in mind here are the separated soul and angels.
- (3) Incorporeal unlimited substance. This is pure act; all aspects of the positive essence receive existence (*esse*). This is, in fact, God who alone exists necessarily, since in Him alone His way of being must be conceived as including existence; in Him no distinction can be made between the essence He has and His existence, for He necessarily completely actualizes His essence, all the positive aspects of the divine essence there are; there is nothing He is only potentially; there is nothing divinely positive He is not.

The object of human knowledge in intellectual cognition is the discovery of what essence is actualized in any individual. We understand substances in so far as we come to know the essence that is in act—is *esse*—in substances. Aquinas holds that for each known truth there must always be something existing (*esse*) that corresponds to that truth. Individual substances are understood by us not as individuals *qua* individuals (individual things as such: features which constitute their particularity), but through knowing that which is general or common in them that defines the nature of the kind in which all the individuals of a certain kind share. Thus we know a dog in so far as we know the real definition of “dog”, and hence understand it in its essential dogness; we do not know the dog in its full particularity because the terms we apply always have some generality of application.

An essence is what must be the case for a thing to be *what* it is: that which a thing cannot lack and still be what it is. Thus understanding *what* a thing is—its essence—is logically independent of the fact *that* a thing is, its existence. I can understand *what* a dog or a Phoenix is independently of *whether* it is. The essence of *X* is given in a set of necessary and sufficient conditions *a, b, c* for *X* to be the kind of thing it is. In this way we can form a real definition: *X* is of a specific kind if, and only if, *a, b, c* are true of *X*. When we are correctly said to know *X*, the aspect of *X* we know is that set of features *X* has in common with all and only other *Xs* of the same kind. We would not understand a clock as a *clock* by referring to its colour or the scratch on the face, but in so far as we understand that in virtue of which a clock is a clock: what makes it distinctively a clock and not another kind of thing. We understand the nature of the clock by understanding those common features shared by all and only clocks which define them as clocks. Then what makes a clock or a dog a particular clock or dog cannot be its essence or form, since that is common to all instances of the same kind, but must, Aquinas argues, be its being formed of a quantitatively or numerically different parcel of matter.

With incorporeal or spiritual substances such a method of individuation is clearly inapplicable; he suggests that each incorporeal substance must be individuated by essence; that is, the essence of each soul or angel must be different, so each angel differs in essence as a dog does from a cat; each angel is of a different, and unique, kind.

Aquinas strikes a middle course on the question of the reality of universals. Universals are general concepts or categories with which we talk about the world and with which we classify particulars into kinds or sorts. Aquinas adopts a form of moderate realism. He rejects the full realism of Plato, whereby universals exist as real entities in a world of intelligible Forms independently of the world of sensible things. He also rejects conventionalism, whereby universal concepts are mere arbitrary, subjective mental constructs, for which the most that can perhaps be said is that they are made for our convenience. Aquinas compromises: universals are *objective* in being real, extramental and immutable, but they exist in instances of individual kinds of things and cannot exist apart from those instances. Universals or kinds as such exist only in virtue of there being individual actual instances of those kinds. Only individuals exist, but the natures of those individuals radically resemble each other and are understood from this essential common resembling nature as being members of universal classes or species—for example, humanity, dogness, justice. Individual material things of the same kind are the same kind in virtue of sharing a substantial form; but that substantial form, although it cannot exist apart from the individuals who share it, is nevertheless something objective in the world, and derives its objectivity from the really existing common nature shared by individuals of the same class. The world divides itself into kinds, so to speak; the kinds are real and there to be discovered, and are independent of our subjective mental classifications. Abstracted forms are derived from individual instances; the logical rules of the combination of such forms are revealed in real definitions; the forms, through real definitions, give concepts which have fixed immutable objective meaning; the forms and their logical combination, known through their concepts, are the proper objects of knowledge. Knowledge of the forms, through real definitions, is derived from sensory experience and the intellectual faculty of abstracting general concepts from the resembling essential nature of instances of individuals of the same sort. Thus although universals do not exist as separate entities, they are objective in reflecting the extramental common defining real natures of individuals.

Ockham

William of Ockham (c.1285–1349) was born in the village of Ockham outside Guildford near London. The details of his life are obscure, and

often a matter of conjecture. Of his early life nothing definite is known. We know that he was ordained subdeacon in 1306. He became a student at the University of Oxford around 1309 and soon a member of the Franciscan Order. He pursued his studies at Oxford until 1315; from 1315 to 1317 he gave lectures on the Bible and, from 1317 to 1319, lectures on the hugely influential *Four books of sentences* by Peter Lombard. The *Four books of sentences* was compiled around 1150; it brought together the teachings of the early Church Fathers—especially St Augustine—and it was a cornerstone of Christian theology.

Ockham completed the requirements for the degree of *Magister theologiae*, but he never became a Master occupying the Chair of Theology. This was probably due to the opposition of Lutterell, a keen Thomist, to the appointment of Ockham; Lutterell had been removed from the post of Chancellor of the University by 1322. Lutterell left in 1323 for Avignon, the residence of Pope John XXII; there he set about blackening Ockham's name by accusing him of holding in his *Commentary on the Sentences* heretical and dangerous views. Ockham was summoned to Avignon in 1324 to have his views examined; the examination lasted for three years. Ockham refused to retract his views.

Michael of Cesena, the General of the Franciscan Order, also faced the condemnation of the Pope for his Order's espousal of absolute apostolic poverty. Ockham joined forces with Michael, his superior, and, together with another Franciscan, Bonogratia, they fled from Avignon in 1328, seeking the protection of the German Emperor, Louis of Bavaria. Louis had installed in Rome an antipope who had in return crowned him head of the Roman Empire. Ockham, Michael and Bonogratia joined the new Emperor in Munich, and were excommunicated from the Catholic Church and their own Order. In 1342 Michael died; in 1347 Louis also died. This left Ockham in an extremely vulnerable position; he sought reconciliation with the Church and his Order. Before any reconciliation could be decided upon, Ockham died in 1349, probably of the prevalent Black Death. He was buried in the old Franciscan church in Munich; but in 1802 his remains were moved to a place that is still unknown.

Ockham may be seen as something of a philosophical Janus, since like that god, his philosophy looks in two opposite directions; it looks back to the Middle Ages, and it looks forward to some of the ideas of the Enlightenment—to the empiricism of John Locke (1632–1704) and David Hume (1711–76), and aspects of materialism—but the forward-looking characteristics must not be overemphasized; Ockham would have seen himself not as a philosophical revolutionary, but merely as reinterpreting an already established tradition. The chief problem was still to reconcile Aristotle and Christianity. A sharp distinction is found in Ockham's thought between reason and faith. The truths of theology are based on revelation and are a matter of faith, and they are neither

provable nor refutable by any process of natural cognition in secular philosophy. Theology retreats to a domain of truths about which natural reason can have nothing to say.

The chief characteristic of the tradition to which Ockham was heir was realism in its various forms: that the human intellect can discover, in the particular things perceived by sense-experience, a real objective system of universal common essences which become somehow individualized, and which can either have an independent existence from, or exist as a real part of, particular individuals. These essences have an extralinguistic reality over and above—*really distinct* from—the particular features of individuals which are classified in virtue of the essence as being the same kind. Then from the linguistic connections in meaning between the terms that refer to these real essences we can know necessary truths about an extralinguistic reality. Necessary truths can be known about the world we perceive and about God. The universals we intellectually abstract—humanity or horse—from particular individuals are not merely arbitrary subjective mental or linguistic constructs, or merely derived from objective particular features of individual things, but have a real ontologically distinct reference in or beyond the world, independent of individuals, or their particular features, whereby such individuals fall into the general class designated by universal terms. In short, the linguistic distinction we make between universal and particular terms has a real ontological counterpart.

The problem of universals—what if anything universal terms stand for—to which realism is one answer, centres on the problem of the relationship between the universality of concepts and our apparently encountering as independent objects only particulars. Realists would argue that, without a suitable system of real entities for universal terms to refer to, our system of universal terms will be entirely arbitrary, conventional and subjective. This would make any science, which will inevitably be couched in general or universal terms (such as “body”, “animal”, “heavy”), an arbitrary mental construction among other possible constructions with no objective validity derived from its reflecting an extramental reality; this leaves open the rationally anarchic possibility of a variety of different incommensurable conceptual systems of scientific explanation between which we can have no common grounds or independent standard for a rational choice.

Moderate medieval realism does not go all the way with Platonism, which suggests that universal essences or “whatness”—such as humanity, horseness, justice—can exist as Forms quite independently of all particular individuals which are grouped together in virtue of those universal essences. Moderate realism follows Aristotle in maintaining that in some way there is a real distinction in the world between the common universal essence and the individuating

characteristics of particular things sharing that essence. Moderate realism holds that, although the common universal essences of individuals and those individuals cannot be found existing in separation, the distinction between universal essences and particular individuals which can be made in thought nevertheless reflects a real distinction in things in the world. The same common nature or essence is really distinct from things in respect of what makes them particular, as it exists in all the particulars of the same sort, and it is this that makes them the kind of things they are.

The forward-looking aspect of Ockham's philosophy resides in his rejection of realism and his alternative explanation: his rejection of the reality of a world of intelligible, literally common, essences or forms ontologically or really distinct from the characteristics that pick out individuals, and his consequent propagation of nominalism and empiricism. His nominalism and empiricism are closely linked.

Ockham objects to the idea of some literally common nature shared by all and only individuals of the same kind; if this common nature is singular and indivisible, then it cannot be shared by many individuals, and if the common nature is many, then each instance of the many must be singular and itself individual and cannot be shared in common between various individuals.

Ockham does not deny that the world falls into a mind-independent system of natural kinds—in this sense he is still a realist. What he denies in his nominalism is that a condition for its being correct to talk about a natural order of kinds of individual things is the positing of common natures or essences, ontologically or really distinct from the individualizing characteristics, and shared by all and only the individual things of the same kind. Moreover, he thinks that such a view is an unnecessary misinterpretation of Aristotle. He denies in this nominalism that universals subsist as ideas in the mind of God prior to their actualization (their receiving *esse*); God is not necessitated even to this extent; He is not constrained to create, if He creates at all, a particular world-system of kinds. There is, therefore, no system of essences whose necessary relations could be known *a priori*.

For Ockham, universality is a property primarily of thoughts, secondarily of language which expresses thoughts, and not of entities or natures distinct from the individual characteristics of things in the world. Universality is the property of a thought, a generalized abstractive cognition, which is entertained in such a way as to be equally truly predicable of, or usable of, more than one individual. Thus the term "city" is used of London, Paris, New York. Ockham's view is roughly equivalent to saying that universals are concepts, along with the commitment that the being of the concepts is as mental states. Nominalism holds that the only thing strictly in common between individuals falling under a universal name is that they all fall under that name.

The question arises as to why we apply the same universal name to many individuals. Ockham's empiricism complements his nominalism by maintaining that there are no literally common real essences graspable by the intellect, but only individuals apprehended by the senses between which we perceive *similarities* in the individuating characteristics, and it is from these albeit objective but nevertheless contingent similarities that we derive the meanings of universal terms and their range of application to a determinate class of individuals. Thus the connotation or meaning of a universal term such as "humanity" is whatever characteristics we perceive as similar between all those individuals whereby we classify them as human. This list of characteristics defines "humanity" and gives us criteria for deciding whether any given individual should be included under that heading; the denotation or reference of the term "humanity" is then just all individual human beings. The meaning of a universal term such as "humanity" is not explained by its denoting a common essence distinct from the characteristics of particular human beings; its meaning is explained by the similar characteristics of a number of individual men, in virtue of which we call them all "men". Talk of something "similar" between many individuals may seem to evoke a common nature again; but Ockham would say that we perceive similarity not by perceiving some literally identical common nature distinct from the individuating characteristics, but in virtue of a resemblance between the characteristics which are part of the natures or features of the individuals themselves.

Thus Ockham denies that there is a metaphysical problem of determining in virtue of what universals are individualized, since there are no such universals to be individualized. Aquinas had suggested that universals are individualized in virtue of their being exemplified in a different parcel of stuff or matter; Duns Scotus (c. 1266–1308) rejected this and suggested that beside universal essences—what features a thing cannot lack and still be the kind of thing it is—there is an individuating essence, the *haecceitas* or individualizing "thisness" of a kind, which gives *this* horse. Ockham, however, has the logical problem of showing how to reduce universal concepts to terms that signify what he regards as the only existents, individuals; and he has the epistemological problem of saying how from experiencing only individuals we form universal concepts.

It should be pointed out that for Ockham the primary carriers of meanings are mental expressions—states of mind—with which written and spoken expressions become associated by convention. Mental signs mean what they stand for directly; linguistic expressions are signs only conventionally; thus the mental sign for rain is the same for the speaker of any language, but its linguistic expression may be different.

Terms are elements in propositions and they take on different

functions depending on the proposition they are in; in particular they acquire a determinate "standing for" (*suppositio*) function. Here we are talking of natural terms or concepts, not the conventional terms of any particular language; the terms "*homme*" and "man" are conventional terms for the same natural sign or concept. Ockham distinguishes between "terms of the first intention" and "terms of the second intention". For example, a singular term such as "Socrates" stands as a natural sign for the *thing* Socrates and is of the "first intention". A universal term such as "species" is of the "second intention" and stands not immediately for things that are not themselves signs, but for other signs that do stand immediately as signs for things. Thus, "Socrates" is a sign for the individual man Socrates; "species" stands not immediately for individual things, but for terms of the "first intention" such as "man", "horse" and "dog"; the term "species" can be predicated of the terms "man", "horse" and "dog", each of which stands for all the members of a different class of individuals, and says of these *terms* that they are all species-terms which are the names of many things. Ockham contends that the realist belief in universal terms standing, albeit obliquely or indirectly, for entities distinct from individual entities is a consequence of confusing the two levels of intentions: terms that stand for things, and terms that stand for terms; that is, talk about things in an object language, and talk about the object language in a metalanguage. If we confuse these two we are tempted to suppose mistakenly that metalinguistic talk is about things.

Nominalism is in accord with the most famous feature of Ockham's thought, "Ockham's razor"; this is a methodological principle designed to keep the number of kinds of entities posited as distinct in the world to a minimum—it is a principle of parsimony. Ockham's objection to realism and the positing of real ontologically distinct essences is partly just that they are unnecessary to explain how we come to classify things in a universal manner. Logically what this means is that apparent reference to real abstract entities by universal terms can in principle always be replaced by an analysis of universal terms, so that they refer only to individuals. Thus "man" signifies merely the total disjunction: Socrates, or Plato, or Aquinas, and so on. Relational terms such as "taller" do not denote entities distinct from the individuals to which they apply; in referring to *A* being taller than *B*, we are referring to only two entities, and the truth "*A* is taller than *B*" is reduced to a truth about *A* (*A* is six feet tall) and a truth about *B* (*B* is five feet tall). The only sorts of thing that exist are individuals: individual substances and their individual qualities.

It has been objected that Ockham's criticism of the real distinction between essences and individuals misses the point, for he attacks a position which the most important medieval thinkers such as Aquinas and Duns Scotus never sought to defend. The accusation is that Ockham thought that if the distinction between the common essence of

individuals and what constitutes their individuality were to be a *real* distinction, then it must be a distinction between *things* of the same sort, such as exists between any two existing individuals, and that Ockham was led to this assumption by thinking of the attribution of essences as noun-like rather than verb-like. If we think of the attribution of essences or forms as more verb-like than noun-like—as in “humanizing”, “equinizing”—we will see that there is a formal objective extralinguistic distinction being made which is separable in thought and is nevertheless not a distinction between separable individual entities. It is not clear whether this pointing up of the distinction between the grammatically verb-like use of ascribed essences to things, as opposed to naming those same things, is sufficient to maintain that there is a corresponding metaphysical extralinguistic distinction between the common natures and the particular features of individuals.

Moving to Ockham’s epistemology, we find that he distinguishes between intellectual acts of apprehension and judgement: apprehension or cognition is awareness on the basis of which a judgement can be made, which is an intellectual assent to the truth or falsity of a proposition. He further contrasts an *intuitive* cognition, on the basis of which one is in a position to make a judgement of contingent fact which is *evident*, and an *abstract* cognition, on the basis of which we are *not* in a position to make an *evident* judgement of contingent fact—such contingent judgement will concern whether an object exists or whether it has some contingent property. The objects of these cognitions are the same; what differs is the manner in which they are apprehended; in an intuitive cognition the apprehension of the object is caused immediately by the object apprehended; in an abstract cognition the apprehension of the object is not caused immediately by the object apprehended, but it always presupposes an intuitive cognition of the object at some previous time. From an intuitive cognition of *X*, or *X* as *f*, we can judge *evidently* that it is true that *X* exists, or that *X* is *f*. Once we have an intuitive cognition of *X*, or *X* as *f*, it can be stored in the memory as an acquired capacity (*habitus*) so we can then form an abstract cognition of *X*, or *X* as *f*, which is divorced from *X* existing or not existing, or *X* actually being *f* or not being *f*; but this abstract cognition of *X*, or *X* as *f*, does not put us in the position to make the judgement we might make concerning *X* *evident*. If I saw you sitting in my study, I would be in a position to form an evident judgement that it is true that you are sitting in my study; if, however, I did not see you, but nevertheless formed from an abstractive cognition the judgement that you were sitting in my study, then the judgement, although it *may* be true, may also be false, and is not in any case evident. Ockham is realist with respect to individual objects and their individual properties in the external world: he does not doubt that in mental acts of intuitive cognition what we directly apprehend is

constituted by objects and their properties just as they really are in the external world outside the mind. In intuitive cognition there is no distinction between the way things seem to us and the way they really are; the way they seem is how they are. Ockham holds that we can also have intuitive cognition of introspectively apprehended mental states.

In the natural course of events, if we have an intuitive cognition of *X*, then *X* exists, since *X* is a part of the cause of the cognition of *X*; thus the judgement that *X* exists is evident. However, since it is logically possible, God could produce supernaturally in us the same mental state as a cognitive intuition—that is, phenomenologically the same intuition, which is *as if* we were having a real intuitive cognition—without the object existing, which would in natural circumstances suffice for the evident judgement that the object exists. But, in fact, God does not normally act like this, although He did so in the case of the prophets.

Ockham's empiricism surfaces in his account of explanations of the natural world. Strictly speaking, science is concerned with necessary universal truths concerning that which must be and cannot be otherwise, expressed in propositions that are proved from self-evident propositions by syllogistic deductive reasoning. But one needs experience even to understand the meaning of the terms in propositions—at least those that stand for things—even when, once understood, they are self-evident propositions; for to understand the meaning of the terms we need a primary experience of what the terms stand for. For Ockham, as for Locke, there are no innate ideas which could account for this; all our ideas, by association with which words get their meaning, are derived from experience.

Science in a narrow sense includes only necessary provable propositions; and since the existence and nature of the world are in all ways contingent (that which may be true or may be false), it would seem that a science of the world is not strictly possible. In mathematics, geometry, metaphysics and theology, there are truths which are quite independent of whether any world exists or not and these are suitable subjects for scientific knowledge. However, Ockham extends science (*scientia*) to include hypothetical or conditional premises of demonstrations or proofs, and evident contingent judgements made on the basis of intuitive cognitions.

Ockham maintains that God must be supremely unnecessitated, being completely free and completely omnipotent. This leads him to assert that the world is radically contingent in its existence and nature; necessity applies only within thought and language, not to events or things in the world. All that is not self-contradictory is possible; what is actual but not necessary cannot be determined by *a priori* reason or logic alone; reason and logic can determine only what is necessary, impossible and possible, not what is actual and contingent among what is possible. Logically speaking in the world anything could

follow from anything else, and the only way to determine what things there are, and how things are connected, is by experience. Ockham does not deny that there are real objective causal connections in nature; the order we appear to see is not merely derived from the conventional use of expressions; he does not deny that there is a natural order in the world that can form the basis for the discovery of universal connections which are the aim of science; what he denies is that these universal connections in fact have any metaphysical necessity which could be discovered through deductive reasoning alone. All those connections between things and events that are not merely analytically true by the definitions which give identifying criteria are radically contingent and can be known to hold only from intuitive cognitions. Thus to have new knowledge of connections which goes beyond what is already assumed in definitions, as is the case with causal connections, we rely on experience. If all connections between things and events were analytic and merely followed from definitions, then working them out would be a purely linguistic matter. Clearly we suppose that most connections are not definitional in this way, in which case the connections can be known to hold only by experience.

Ockham does not tackle the question which was to concern Hume much later, in the eighteenth century, of how we can rationally justify the belief that there is any objective natural system of laws at all—the problem of the “uniformity of nature”—or how the evidence from the experience of a finite number of singular instances can ever justify the assertion of universal laws of the form “All *As* are *Bs*” or causal connections of the form “If *A* occurs, then *B* must occur”. Ockham thinks that God has, as a matter of fact, so arranged things that we can discover objective regular natural laws; but these laws are only contingently—in fact—true, and God could have arranged the laws quite differently; He was not bound by any kind of necessity to arrange things the way He actually arranged them. It follows that if the arrangement of things is not a matter of necessity, the discovery of the arranged regularities is not knowable by *a priori* deductive reasoning alone, which can give us knowledge only of necessities (that which must be), impossibilities (that which cannot be) and possibilities (that which may or may not be); rather, we require experience in order to discover what actual contingent (that which is, but need not be) arrangement exists. God maintains the natural order so that we can rely (barring miracles) on *B* always following *A*; *A* is a sign that *B* will follow, and we can be confident, thanks to God, that *B* will follow. This is not to say that God, and not *A*, is the real cause of *B*, but merely that God chooses to maintain a natural order whereby, albeit contingently, *A* causes *B*.

CHAPTER FOUR

Rationalism: Descartes, Spinoza, Leibniz

The philosophers of the seventeenth and eighteenth centuries are often separated into rationalists and empiricists. While this distinction certainly blurs similarities between philosophers of both “schools”, this retrospective classification has some value at least in bringing out tendencies of the philosophers grouped under these headings. The contrast chiefly lies in what is said to be knowable by pure reason alone. Some factors consistently underlie rationalist philosophy.

Rationalism holds that the human mind has the capacity, logically speaking, to establish truths about the nature of reality (including ourselves) by reason alone independently of experience; indeed, if knowledge of the fundamental structure of the world in the proper scientific sense is possible, then it must be derived from reason, which alone has access to the required certain, necessary, universally valid, timeless truths; the senses inform us only of what is uncertain, contingent, particular, perspectival and transient. These necessary truths about the world can be known to be true merely through our properly understanding the concepts they involve or are deduced from such truths, and ideally they form a single deductive system. Truths known *a priori* by pure understanding, if they do not concern the world as it appears in perception, instead concern a really existing intelligible world that underlies the appearance of changing particulars that we experience; this underlying reality makes intelligible, and ultimately explains, the appearances. The intellect has access to concepts, and the terms that express them, whose meaning does not depend on being referred to some feature of our experience. Thus there is, according to the rationalists, a reality whose nature is comprehended by the intellect (reason or understanding) alone and which stands behind the mere appearance of things; it is this ultimate reality which delivers the conceptions which bring the explanation of the way the world is to an end.

The rationalists do not disregard the senses, but they share the characteristic of thinking that knowledge based on experience is inferior to that derived from reason. The rationalist contention is that the world has an underlying real structure of natural necessary connections, which is logically understandable by reason and deduction alone; this does not inevitably lead to the advocacy of an *a priori* methodology in science—as if all scientific truths can actually be discovered just by sitting and thinking—for although in principle or ideally the world is understandable *a priori* by the intellect alone, in fact we as humans have a limited capacity to determine the nature of the world independently of experience; scientific truths are often in fact discovered by us through experience. Moreover, the necessary *a priori* truths of metaphysics concern not the world of appearances, which is the subject matter of science, but a reality beyond appearances.

There is the conviction among the rationalists that everything is in principle rationally explicable; one can never rest content with features of the world for which a reason cannot be given as to why they necessarily are a certain way and not otherwise. The tendency of empiricism is to admit that there are *a priori* necessary truths knowable with certainty independently of experience, but to deny that such truths can determine anything about what really exists or the real nature of the world, because in all such cases we are dealing with the contingent features of the world we experience, and not what is necessary concerning a supposed world beyond possible experience.

Descartes

The importance of Descartes in Western philosophy can hardly be overestimated; he shaped the kinds of questions and answers which were to dominate Western philosophy for many years; and, with some notable exceptions, this approach has only seriously been questioned in the twentieth century.

René Descartes (1596–1650) was born in France, in a small village near Tours that is now called La Haye-Descartes. His constitution as a child was poor. He was educated at a Jesuit college at La Flèche in Anjou. Here he encountered scholastic doctrines that his philosophy was to reject; but he also discovered his love for and great proficiency at mathematics; and he remained a Catholic all his life. Descartes had the desire to travel and experience the world of practical affairs, and to this end he joined, unpaid, the army of the Dutch Prince Maurice of Orange and later the army of the Duke of Bavaria.

While in Holland he encountered Isaac Beeckman, who encouraged Descartes to consider questions in mathematics, physics and philosophy. On 10 November 1619, he spent the night by a large stove

in Ulm; there he had a vision, and later three dreams, concerning how he might lay the foundations for a unified science which would include all human learning. From 1625 he spent two years in Paris, where he lived the life of a gentleman; he gambled, and was involved in a duel over a love affair. In 1628 he began writing, in Latin, *Rules for the direction of the mind*, which was unfinished and unpublished in his life time. This states the overall projects that were to preoccupy all of Descartes' philosophy: that of founding science on absolute certainty, free from sceptical doubts, and that of devising a method of inquiry which, if properly followed, would lead science inexorably to certain truth.

Descartes spent most of the period from 1628 to 1649 in the relatively liberal atmosphere of Holland. The death of his five-year-old illegitimate daughter Francine in 1640 was his life's great grief. He was secretive about his whereabouts, and lived in many different houses; he also had a great desire for solitude, although he was not always without company. In 1647 Descartes had dinner with the philosophers Gassendi (1592–1655) and Hobbes (1588–1679), both of whom were critics of Descartes' *Meditations*.

Descartes received criticism of the *Meditations* from various theologians, and most fruitfully from Antoine Arnauld (1612–94). All these criticisms are printed as *Objections* and *Replies*; the latter of these being Descartes' responses. We are fortunate that as well as producing his major writings, he engaged in extensive correspondence with many people about his ideas. Towards the end of his life Descartes developed a friendship with the exiled Princess Elizabeth, daughter of Elector Frederick; he replied in letters to her acute questions. He acquired royal patronage from Queen Christina of Sweden, and was persuaded in 1649 to go to Stockholm. There he continued his long-standing habit of rising late, having spent some hours in the morning reading and writing in bed. In Sweden he led a lonely life, and in 1650, in the winter, he contracted pneumonia and died. His last words are said to have been "My soul, we must leave". Although initially buried in Sweden, his body was eventually transferred to the church of Saint-Germain-des-Prés, and his skull is to be found in the Musée de l'Homme, in Paris.

The overall aim of Descartes' philosophy might be said to be the attempt to free explanations of the nature of the world from confusions and conflicts, and set them on a path that would lead to a unified explanation of things that was true, and, because it was also certain, free from scepticism. Descartes made a significant contribution to the revolution of how man viewed his place in the universe, and the proper way of pursuing truths. His particular contribution to this revolution in thought is the egocentricity of his approach: the foundation of truth and knowledge begins by working from what is most evident to the mind of the individual.

In the dedication to the *Meditations* Descartes seems to have other aims: proofs of both the immortality of the soul and the existence of God. It would be wrong to suppose that he was insincere in his expressed concern for these matters. However, the concern of enduring importance for modern readers lies in his aim and method in securing a scientific, in particular mathematical, understanding of the world that is secure against even exaggerated sceptical doubts. More generally this involved a search for a method of ridding ourselves of beliefs not known to be true, and maximizing those which are known to be true. Descartes presents such a search to us in the *Meditations* in the form of a personal odyssey. This is a kind of intellectual record so that anyone might follow the same procedure at least once in his life, and by it strip his mind of the accumulated rubbish of uncritically accepted beliefs. Descartes sets out in the *Meditations* not merely the arguments for his philosophy, but also a convincing route we can follow which will enable us to overcome the psychological resistance we may have to such a journey. It is the path which should be followed by the seeker after the ultimate foundations of knowledge; in particular it involves showing that a mathematical physics of the world is attainable by creatures with our intellectual capacities and faculties.

Descartes sets out on an extraordinary procedure of answering the most extreme scepticism about knowledge and rationality by embracing that scepticism; he then attempts to show that something remains that cannot conceivably be doubted even after scepticism has been applied in its most stringent form, and that what remains is sufficient to secure the foundations for knowledge. The tool used to this end is the "method of doubt".

The final position at which Descartes wishes to arrive is that we can have *objective* knowledge of the world; knowledge independent of the way we happen to be biologically constituted; disinterested knowledge that aims to divest itself of our perspective, and that tells us how things really are in the world. Descartes thinks that such an objective conception must be independent of our contingent sensory faculties, since we have no guarantee that our senses present to us the world in its fundamental form; after all, if our senses changed, the world would appear differently. So the aim is to produce a way of describing the world based on conceptions which would not change if our senses changed; a world whose laws we could fraternally share with any rational beings. To be objective our science must be sense-independent, and derived from reason or the faculty of understanding. Descartes sets out to show that when the mind is emptied of all sense-dependent beliefs, it is not empty of ideas or concepts, and that the ideas that remain are sufficient to form the basis for science. This involves a belief that we have innate ideas independent of the senses; we have such ideas concerning mathematics and geometry. By "ideas" here

Descartes does not mean images; he means concepts. Descartes attempts to show that the fundamental explanations of all phenomena can be derived from a mathematical and geometric conception of reality independent of sense-experience. Descartes aims to demonstrate that mathematical geometry can be applied to the explanation of the world of material things because, contrary to the appearance of a vast array of natural kinds of things in the world, the only essential properties of matter are geometric; that is, matter stripped of all properties other than the ones which geometry deals with will still be matter, and will be matter if and only if it has those properties; those properties are extension, shape and motion, of which extension is primary. The essential properties are those properties which a thing cannot lack and still be the kind of thing it is.

Descartes in many ways can be seen as opposing the Aristotelian science; Aristotle takes at face value the division of the world into what appear to be natural kinds of things. An Aristotelian scientific explanation of some phenomenon associated with a thing is then obtained by deducing the phenomenon from an intellectual examination of the essential nature of that thing given by a real definition, or from a more general category of which the thing is a part. The identification of genuine natural kinds, from which explanations are to be deduced, is very difficult. However, Descartes does not reject essentialism, which is the view that we eventually reach a certain category of stuff beyond which we cannot go since we have reached that which is most ontologically self-sufficient, and from which we derive explanations of everything else that appears to us in the world. But instead of a vast array of the natural kinds there appear to be, Descartes, in the case of the material world, reduces this to one fundamental kind: matter as extension. It is in terms of this underlying reality behind appearances that the variety of features making up appearances are to be explained. The explanation of a vast array of different phenomena is thus simplified and unified under a more general conception which reflects the fundamental nature of reality. The tendency of Descartes' philosophy, and the revolution of which his philosophy is a part, is to reopen the gap between how things appear to us in perception, and how they really are in themselves; moreover, how things really are, which should form the basis of the explanation of appearances, has to be comprehended by *intellectual* contemplation or thinking, not experience. This marks the distinction between primary qualities, which are the real qualities things have independently of perceivers, and secondary qualities, which are in objects as arrangements of primary qualities (say particles in motion), but which produce in perceivers quite different ideas, like the experience of heat and red.

First, Descartes has to deal with radical scepticism. The method of doubt seeks to eliminate all beliefs not known to be true which may

taint and infect the truth; it does this by rejecting as *false* all beliefs it is *possible* to doubt; that is, it rejects all beliefs whose falsity is possible. In this way Descartes meets the sceptic head-on. This is done not because he thinks all those beliefs it is possible to doubt the truth of are false; rather, it is a way of making certain in one go that no false beliefs slip through and are mistakenly accepted as true. It is important to note that Descartes is not suggesting that we adopt such scepticism in our everyday life; Descartes' doubt is a method adopted for the pure project or special purpose of securing the first principles or foundations of all knowledge, disregarding all practical concerns. Straight away we can note that we do, after all, find cases of things we once believed to be true turning out to be false. Even without sceptical doubt, Descartes' view that we should make a fresh start makes sense; we have over our lifetime accumulated uncritically a mass of beliefs from which we make all sorts of inferences; but any falsity among these beliefs is likely to infect any inferences we make and conclusions we draw from those beliefs. If we then arrive at true conclusions, even in valid inferences, it can only be by a sort of luck.

What remains after this process of sceptical doubt is not a massively rich axiom from which all that we would wish to claim we can know can be deduced, but something which, when examined for the reason for its immunity from doubt, will give us a *criterion* to distinguish truth from falsity. That criterion is clarity and distinctness. Descartes does not wish the criterion to be merely a notion of subjective obviousness, but he is unable to formulate it in terms of primary truths or logical truths whose denial implies a contradiction, in the way that Leibniz does; rather, Descartes explains it as our possessing intellectual intuition giving us an ability simply to see that certain propositions or beliefs, once fully understood, must be true. After this we can begin to reinstate many of those beliefs we previously supposed false. In this search we take time off from practical concerns and constraints, and apply the criterion single-mindedly.

Descartes embarks on his method of doubt by disposing of the range of beliefs in three classes: first, we abandon sense-based beliefs by accepting that the senses may deceive us; second, we abandon the belief that we can have knowledge of real "simple natures"; third, we abandon the belief that God exists. A belief in the existence of God is simply dropped, both because Descartes has no wish to assume one of the things he sets out to prove, and because if the existence of a beneficent God were granted the radical scepticism Descartes envisions would not be plausible. Descartes also wishes to show that there are degrees of doubt involved in these classes of beliefs, and to indicate the order of trustworthiness in which we should reinstate them; he also wishes to make the method of doubt psychologically convincing. To these ends he suggests two hypotheses: the "dream hypothesis" and the "evil demon hypothesis".

The first of these—the dream hypothesis—points to those occasions on which I thought I was awake when in fact I was dreaming. Our sleeping dreams may also be phenomenally or qualitatively indistinguishable from our waking states: I may be convinced I am awake and seeing real things when I am in fact asleep. This suffices to undermine the trust we may have in the senses as representing to us something real. This doubt extends to the existence of my own body, which brings us to the second class of beliefs: the existence of “simple natures”. When we dream we dream about something, and that something must conform to the most simple and universal categories such as extension, shape, duration, number, movement. Even if what we dream of does not exist exactly as we dream about it, it is still possible, and less doubtful, that simple and universal natures exist; for example, objects with extension. Thus an object of a specific shape might not exist because we might dream about an imaginary unreal object of that shape; but that is not the same as showing there are no objects with shape: shape as such does not exist. Even dreaming involves objects considered under the simplest categories and concepts which are surely real. Horses, and bodies of particular shapes, may not exist, but it is less doubtful that there exists a world of extended material things at all. Moreover, the greater security of mathematics and geometry derives from its dealing with simple natures (such as number and shape) and their necessary relations regardless of whether those general things exist or not. Geometrical proofs done in a dream would still be valid since their validity is independent of whether geometric objects exist. The evil demon, however, who has the active power to deceive us has the ability to lead us to believe falsely that there exist in the world even the most general sorts of things characterized by simple natures. The evil demon finally makes it conceivable that no external world exists corresponding to our idea of a world of extended substance; the evil demon could cause our idea of an extended world although that world does not exist. It is not always clear if simple mathematical and geometric truths can be doubted under the influence of the evil demon. It must be remembered that it is not within the power even of the demon to alter logical truths and to make $2+2=4$ false and $2+2=5$ true; however, the demon can make us *believe* that $2+2=5$. Descartes thinks it is within God’s power to alter such logical truths. Even if we accept that beliefs in basic mathematical and geometric truths survive the demon, we have not established that anything exists corresponding to the simple natures; doubt as to their existence is *conceivable*, so their existence is therefore not free from scepticism. We have at best a pure mathematics and geometry which has not been shown to apply to anything existing, for the simple natures are what it would deal with.

What remains that cannot be doubted is *cogito ergo sum*: I think, therefore I am. For however the demon may twist and turn in his

attempt to trap and deceive us, and lead us to accept doubtful and false beliefs, there is one belief I cannot doubt: that whenever I think, I exist. This belief is somehow self-verifying; the mark of truth is intrinsic to it and does not depend on accepting any other truth. Even if the content of that thinking is itself an act of doubting, this too could not take place unless I existed. The *cogito* is the necessary condition for all reasoning—even all deception. Each time I entertain the *cogito* it is certainly true.

What is more, I am essentially a thing that thinks, for, although I can doubt that I have a body and still exist, I cannot cease to think and still exist. Descartes believes that he is essentially a thinking thing; he is necessarily immaterial (incorporeal) if he exists at all, and only contingently embodied. The question of whether he is entitled to this conclusion is much disputed; but one obvious objection has been that it does not follow from the premise “I necessarily exist whenever I think” that “I am necessarily only a thing that thinks”. We might accept that “I think” entails “I exist” without agreeing that “I exist” entails “I think”; I may still exist in some other way when I do not think. Therefore I may not be essentially only a thinking thing. There is indeed some doubt as to how much weight Descartes puts on this argument. Whatever we think of this, Descartes is committed to the view that he is essentially a thinking thing, and that thought is his only essential property. Descartes of course presents more than one argument for this view.

By essence Descartes means some property, or set of properties, *f*, such that if *f* is an essential property of *X*, then *X* cannot be an *X* without possessing property *f*; if *f* is the essence of *X*, then *X* cannot be what it is or the sort of thing it is without *f*. Thus, *f* is a necessary and sufficient condition for *X* to be *what* it is independently of the fact *that* it is. In a case where there is only one essential property, as with mind and matter, that property is alone both necessary and sufficient. Descartes thinks we can know—that is, have clear and distinct conceptions of—what mind and matter are before we know whether any exists or not. For Descartes, as for other rationalists, only God has existence as part of His necessary and sufficient conditions for what He is: God. In this way Descartes draws the distinction, criticized by Spinoza, between true substance, God, and the finite or created substances mind and matter.

As it stands, the *cogito* is merely a subjectively certain truth; it is time-bound; its certainty is restricted to those times when it is actually being entertained. Descartes obviously wishes to move beyond the perpetual reiteration of this one truth. What makes the *cogito* a certain truth is that it is clearly and distinctly perceived. Descartes makes use of an analogy with sense-perceptions: an idea is clear in so far as we attend to features of which we are forcefully and immediately aware, and an idea is distinct when we attend only to

those features which are clear, and thus do not make inferences beyond that of which we are immediately aware. This turns out to be awareness of the essential nature of the objects of one's awareness; and awareness of an object's essence means that the object of awareness could not be confused with anything else. The thinking behind clear and distinct ideas is that there must be a "natural light" of reason that allows a direct grasp or intuition of some truths with certainty, independently of the acceptance of any other truths. They are grasped by anyone who can reason and can understand at all. If some truths are not immediately manifestly true on intrinsic grounds alone, following our full understanding of them, without any further ("external") justification, then all reasoning would be impossible, since it could never get started. Those propositions which we can clearly and distinctly conceive, or intuit, can be known to be true because we can see they must be true merely from completely understanding them. Such truths can be seen as analytic: they can be known to be true merely from understanding the meaning of the terms they involve.

One problem with the *cogito* is that in it Descartes does seem to go beyond what he is immediately aware of; what he is aware of is particular acts of thinking; but this falls short of establishing a durable "I" or self as a mental substance on which the thinking depends.

Descartes' plan is then to move from the two features of the *cogito*, thinking and existence, to prove the existence of God. Having established the existence of God, Descartes relies on our understanding of the nature of God as an all powerful, perfect and benevolent being to say that, as deception is an imperfection, God would not deceive us in that which we most clearly and distinctly conceive: that is, truths that are knowable through the understanding alone. If I do not go beyond judging as true that which I clearly and distinctly perceive, then I will always judge truly, and I will not entertain falsehoods.

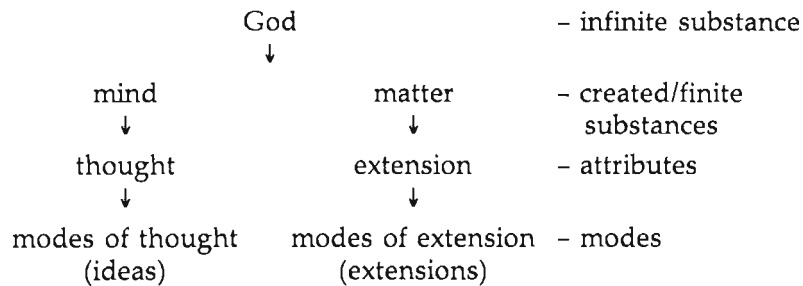
What I clearly and distinctly understand about things is the essential properties of those things; those properties without which those things cannot be the kind of things they are; those properties which, if I think about those things at all, cannot be separated from, and so must be part of, my conception of those things. These are the defining properties of substances, on which all the other apparent qualities of things rely. There are three substances according to Descartes: matter, whose essential property is extension; mind, whose essential property is thought; and God, whose essential properties are perfection, omnipotence, benevolence, infiniteness, and existence. Only God contains *existence* as part of His essence; that is, among the necessary and sufficient conditions for being God is existence. But the created substances of matter and mind are distinguished by relying on nothing else apart from God for their existence. The same cannot be

said for colour, for example, which relies on there being an extended physical object which is coloured.

If we examine the essential properties of mind and matter, we discover that it is the intellect, independently of the senses, which gives us our understanding of them. If we conceive of mind and matter, and we imagine away all those properties which seem unnecessary to their being either mind or matter, we find that we are left with the essential properties; thought in the case of mind, and extension in the case of matter. Without these properties neither could have any other properties at all; the essential properties are what all other properties depend on. All the other properties can change, but without extension and thought, matter and minds respectively would not be what they are. These essential natures remain constant to give identity to matter and minds through the changes they appear to undergo according to our senses, and even when all the sensory qualities have changed; the intellect reveals the underlying reality upon which sensory appearances are a kind of clothing. If the senses are eliminated by sceptical doubt, it is by the sense-independent conception of the understanding that the essential properties or intelligible properties remain known to us. The essential properties these substances have are what remains constant through change, and makes sense of the continued identity of a thing over time through *accidental* change. If essential properties change, we do not say that *X* has acquired property *g* and lost property *f*, we say, rather, that *X* has ceased to be *X*; it ceases to be the same substance if it loses its essence. What makes a material thing (for example, a piece of wax) a piece of matter through its various appearances is not sensible qualities (something we perceive by sense), for these can all alter; the conception of a material thing revealing its essence, by which we identify it as the same material thing through its various appearances, is therefore given through inspection by the intellect.

The thinker who has reached the intuitive certainty of his own existence and the essential nature of that existence has still to get beyond this. Descartes distinguishes between levels of reality, or being, by degree of ontological dependence; the more independently a thing exists, the more formal (actual) reality it has. Descartes distinguishes between objective and formal reality. An idea has a certain degree of formal reality as an entity in itself; but it also has an objective reality—its content, what the idea is about—which may differ from its formal reality as an idea. The cause of an idea must have at least as much *formal* reality as the idea has *objective* reality; that is, the actual cause of an idea must have as much reality as the content of the idea. One idea we have is the idea of God. In the case of the idea of God we have an idea with infinite objective reality since the object of that idea has infinite formal reality. An idea with such a content (such an object) could not be caused by something merely finite, with less formal

reality than the content, like ourselves, but must have as its cause something of equal or greater actual or formal reality; so only God can be the cause of our idea of God. This is a cosmological argument for God's existence. The notion of levels of reality can be summarized in the following diagram; the arrows show the direction of decreasing formal (actual) reality.



The other argument Descartes uses to prove God's existence is the ontological argument. God contains, by definition, all perfections, and one of these perfections is existence itself. Therefore God exists. One problem here is involved in suggesting that existence is a predicate rather than a term confirming that predicates are actualized. Another problem is that, although it may be part of God's definition that *if* He exists, then He exists necessarily, it may still be questioned whether anything actually satisfies that definition.

A serious problem for Descartes' arguments which aim to escape the exaggerated doubt is the charge of circularity: the Cartesian Circle. If we are dependent on the existence of God to free us from scepticism, it is important to see how far this dependence extends. If the dependence extends to God being our only guarantee of the truth of even that which we most clearly and distinctly perceive, then it is impossible to see how there can be any rational proof of God's existence; in that case the truth of any of the premises and the reliability of any of the inferential steps in the proof would logically depend on the outcome of the proof: God's existence. We cannot, without circularity, prove God's existence by means of propositions and arguments whose truth and validity depend on assuming God's existence. It is not clear what Descartes' final view is on this. One suggestion has been that God's role is not to guarantee clear and distinct ideas themselves as we intuit them—since they are in that case as certain as they could ever be—but to obviate the necessity of our running constantly through proofs to reassure ourselves. The central problem then with the proofs of the existence of God is not their circularity but their questionable validity and the dubiousness of their premises.

Descartes, however, thinks he has proved the existence of God. Having done this he can begin to reinstate some of the things cast

aside by the method of doubt by invoking the nature of God. In the case of the material world, what we clearly and distinctly perceive about it is that it is extended; and this is something grasped by the intellect, not the senses; it follows from our merely properly understanding the concept of matter. God would not deceive us about what we most clearly and distinctly perceive. Those ideas that we most clearly and distinctly conceive are innate; and once God's existence is proved, the truth of those ideas we identify as innate by subtracting the sense-derived ideas is also guaranteed by their being directly planted in us by God. This then gives us a pure physics of the world, but it is one that is hypothetical: we have a clear and distinct idea of what matter is as being essentially extended, but the question remains as to whether such matter actually exists. God is required again in order to demonstrate the possibility of an applied physics. The ideas I receive when I perceive a material world, which I suppose are caused by external bodies, could indeed have as their cause external bodies, but their cause might also be myself, or derive directly from God. These ideas come to me unbidden so I cannot be their cause, and I have a strong belief that they derive from material bodies; if the source of the ideas was other than what I strongly believe it to be, God would be allowing me to be deceived; but God is no deceiver; therefore bodies exist. This argument aims to prove the existence of the material world. This establishes the possibility of applied physics within what I clearly and distinctly perceive about bodies. If we judge as true only that which we clearly and distinctly perceive, God guarantees that those judgements correspond to actual states of affairs in the world.

All that has been established in Descartes' argument has been established by pure reason alone independently of information derived from the senses; the senses have been denied any role by the sceptical doubt. Truths must be tested by reason, not by the unreliable senses.

If God is no deceiver, why does he let us make mistakes at all? Letting us make mistakes is not the same as actively deceiving us. Descartes is clear that such mistakes as we make are our responsibility, not God's. The mind is made up of two chief faculties: intellect and will. We make mistakes when we allow the will to push beyond what is clearly and distinctly perceived by the intellect. God gives us the possibility of avoiding error: we merely have to stick within what we clearly and distinctly perceive: propositions we can know to be true purely by fully understanding them.

If this is the case, it tends to undermine Descartes' proof of the existence of the material world. His argument depends on the notion that God cannot be a deceiver and would be deceiving us if he allowed us to believe strongly that material objects were the cause of our perceptions of material objects when they are not the cause. But God

could only be accused of deception if in those circumstances He either implanted the belief in us, or such a belief was a clear and distinct one. Descartes does not attempt to demonstrate the former, and the latter is obviously not the case. So it is perfectly possible that God is not a deceiver and that material objects do not exist as the cause of our perceptions of material objects. Descartes has already admitted that God lets us make our own mistakes in judgement and these are likely to occur when we make judgements beyond what we clearly and distinctly perceive to be the case.

Descartes gives a dualistic conception of reality; there are two basic substances in the world, mind and matter. These two give at least the appearance of interaction: things in the world act on my sensory organs and result in perceptions; I will my arm to move, and it moves. But the problem arises for Descartes of how a non-spatial (unextended) substance, which cannot thereby be in motion, can cause the motion of extended substance, or how motions in our bodies can cause changes in consciousness. Mind and matter have no properties in common, and it is difficult to see how their interaction can be rendered intelligible. They are created substances dependent on God for their existence, but apart from that the explanation of their states should be independent of any causes "external" to their own type of substance. Descartes' motivation for dualism derives from his belief in both the immortality of the soul and the possibility of free will. The immortality of the soul is maintained by the soul being an independent substance which might survive the dissolution of the body. Free will is maintained by making the soul independent of the deterministic mechanical laws which govern matter; then our behaviour is not governed by mechanical compulsion, but can be acts done out of choice in knowledge of good and evil.

It is important to summarize some of Descartes' achievements. They are mainly seen in his attempt to gain a more objective point of view of the world, and this requires a conception of the world which is non-sense-based; an objective conception is non-species specific, and independent of the way we happen, contingently, to be biologically constituted. Some of our view of how the world is is contributed by our natures; and to get a view of how the world really is (how it is in itself), it is necessary to strip away as much as possible of the elements in our conception contributed by the particularities of our perceptual apparatus and perspective. Certainly the sense organs we happen to have could alter to give us a different view of the world, but the world would not thereby be different. The objective conception of the world is a conception which is universally valid, revealing the world as it is in itself, a conception devoid of features that depend, as apparent features of the world, on the contingent peculiarities of our point of view, such as those derived from our particular sensory apparatus. Reason provides a conception, as a source of disinterested universally

valid concepts and truths, independent of our, or indeed any, point of view. Take an extreme example: the truth $2+2=4$ would presumably be a truth for Martians no matter what sensory apparatus they had—they might see X-rays but not light-rays. The idea is that our view of the world could be objective and universally valid in the same way. We cannot perhaps attain this ultimately objective point of view—a God's-eye, or no-eye view—but it is something at which we can aim; only God sees things as they are in themselves independent of any point of view; for God there is no appearance/reality distinction, for His view is non-perspectival.

We can obtain objective knowledge of the physical world, according to Descartes, by concentrating exclusively on conceiving it to have only mathematical and geometric properties. Descartes needs to start from the point of disinterested pure consciousness, which is outside nature; using only the resources of reason or intellect that are found within the incorporeal consciousness, Descartes hopes to build a unified and universal conception of nature which would be common to all beings capable of reasoning at all.

Spinoza

Benedict (Baruch) de Spinoza (1632–77) was the son of a Jewish merchant who fled to the Netherlands from persecution in Portugal. The Jews who entered Amsterdam met a close-knit and strict Jewish community to which they had to accommodate themselves by manifesting doctrinal purity. Spinoza was taught at a school run by a rabbi, and he became familiar with Hebrew sacred books and Jewish theology. But in 1656 he was excommunicated from the Amsterdam synagogue for being unable to assent to important aspects of Judaic orthodoxy; the root of this lay in Spinoza's increasingly critical attitude towards the Bible. His life as an outcast from the Jewish community necessitated that he become financially independent; so Spinoza came to make his living as a lens grinder. Although towards the end of his life he was offered a professorship at the University of Heidelberg, he declined it as a threat to his intellectual freedom—he thus never held an academic post.

The advocacy of toleration, particularly the opposition to religious fanaticism, was a mark of Spinoza's outlook, surrounded as he was by violent schisms of every sort. Spinoza was held in great affection by his friends—friendship between those who in common seek truth being something, in the Aristotelian tradition, he valued highly. Something of Spinoza's inner strength and personal bravery is indicated by two incidents toward the end of his life. In 1670, while living in The Hague, Spinoza received a small annuity from Jan de Witt, Grand Pensionary of the Netherlands and an enlightened

advocate of religious freedom. De Witt was accused of treachery in 1671 when England joined forces with France against the Netherlands; an angry mob seized de Witt and his brother and beat them to death. In an uncharacteristic display of recklessness, Spinoza was prepared to confront the mob and denounce their barbarism, but he was dissuaded from this course of action. Later, in 1677, following his appointment to a peace mission to France, Spinoza too came under suspicion as a spy; his house in The Hague was besieged by an enraged mob; again Spinoza was prepared to try and face down the crowd despite the possibility that he might be killed in the same manner as de Witt.

However, these are incidents untypical of Spinoza's life, most of which was spent in independence and simplicity; he was stoical in outlook, and dedicated to intellectual and scholarly pursuits. Fortunately he was able to discuss his philosophical views with tolerant Protestant friends. He was uncomplaining, and cautious; suspicious of violent emotions (which is not to say he was unfamiliar with them), knowing well their destructive power; but he did not thereby lack either charm or warmth. He smoked a pipe, and liked to drink beer. He was unmarried, thinking that such emotional attachment would disrupt his scholarly study; although it seems that he had been disappointed in love early in life. The consumption from which he had suffered for many years, aggravated perhaps by the glass dust he breathed in his work as a lens grinder, claimed his life in 1677. Spinoza's interests wandered freely across mathematics and the various sciences. Among Spinoza's modest library there was the Bible, books of Euclidean geometry, works on optics, and astronomy. This apparently likable man was vilified both during and after his life, variously as heretic and atheist.

Spinoza's correspondence aids our understanding of his philosophy: that with Henry Oldenburg, who became secretary of the new Royal Society in London, but most important that with the scientist Tschirnhaus. In 1676 Spinoza was visited by Leibniz; he overcame Spinoza's initial wariness to the extent that Spinoza allowed him access to the unpublished *Ethics*. Spinoza also became acquainted with Christiaan Huygens who originated the modern theories of optics, and corresponded with Robert Boyle, the founder of chemistry.

There are probably three main influences on Spinoza's philosophical views: scholastic Aristotelianism transmitted through the early Jewish thinker Maimonides (1135–1204); Cartesian philosophy; and the works of Hobbes. Spinoza came to reject, or modify massively, all of these influences.

To gain full understanding of Spinoza, it is the *Ethics* on which one must concentrate. The *Ethics* is a work of stupendous ambition. Spinoza aims to connect how the world necessarily really is at its

deepest level with the practical concern of how we should live our lives and attain a blessed peace (*acquiescentia*) of mind. This project has a good deal to do with ways of controlling, but not eliminating, the emotions; emotional states and reactions are inextricably linked to beliefs; if we see that certain of the beliefs we hold are false, we can thereby change the emotions connected with those beliefs. This suggests that through a form of cognitive therapy there can be some control over emotions.

The *Ethics* is set out in a form which follows the methods of geometric proof: using axioms, definitions, and postulates, from which propositions are inferred by deductive reasoning. It uses a highly abstract and technical language, much of which derives from the medieval scholastic tradition—although its views are quite opposed to scholastic metaphysics. Spinoza aims to start from first principles which he thinks self-evidently true, and then logically deduce what consequences follow; thus the propositions that follow are proved and necessarily true. The definitions are not merely stipulative (arbitrarily laying down how a word will be used); they are meant to be true of the objects to which they refer; they are “real definitions” which can be true or false because they aim to give the necessary and sufficient conditions for their reference being what it is; that is, such definitions give a thing’s essential features. Nevertheless, the definitions often depart greatly from common usage. The axioms are both self-evident and primitive: they are obviously true, and not derivable from anything simpler.

The heart of Spinoza’s philosophy is the nature of *substance*. Certain aspects of the world seem to be dependent on other aspects for their nature and existence; if anything in the world is ultimately real in being fully independent—and we are not to embark on an infinite regress—we must reach something that does not depend for its nature and existence on anything else. The rationalist contention is that by chasing down the ladder of dependence, our *intellect* or *reason* will reveal what satisfies the conditions for ultimately independent being which is fully self-explanatory and explains everything else, so nothing whatsoever is left unexplained. The universe as a whole must have no superfluous features in its nature or existence that are inexplicable in being not deducible from its total concept. Spinoza is dissatisfied with Descartes’ analysis of substance; Descartes’ notion of the “created substances” mind and matter is for Spinoza a mistake because they are not fully self-explanatory. There are, for Spinoza, two main conditions which must be satisfied for something to be regarded as a substance:

- (a) Whether that thing is self-subsistent or self-caused (*causa sui*): that which has the most independent sort of nature and existence and does not owe its nature and existence to anything else.

- (b) Whether that thing can be totally conceived—understood or explained—through itself alone, without involving any conception of another thing outside it.

And there is a third point to be borne in mind which ultimately derives from Aristotle:

- (c) A substance is that which is a subject (ultimately: *always* a subject) and not a predicate (ultimately: *never* a predicate). It is the subject of predication, and not predicated of anything; it is what remains the same through changes in predication.

So substance is that which is self-caused, self-explanatory, and the ultimate subject of all predication. This amounts to saying that true substance must be such that all of its features are deducible from its essence.

Spinoza is committed to some form of the ontological argument: God, and only God, exists necessarily, since God's essence involves existence; it would therefore be a contradiction to suppose God did not exist. So God exists and, moreover, only God can fulfil the conditions for substance, therefore there can be only one substance. It is a mistake to regard mind and matter as substances: they are not fully self-subsistent, but are dependent modes or manifestations of God. Only God includes existence among the necessary and sufficient conditions defining His nature. A true substance must be that which contains within itself, as part of its essence, the *complete* explanation of its nature and existence.

This complete causal autonomy and explanatory autonomy amount to the same thing. If we have a clear and distinct conception of things, which we derive from self-evident truths intuited by the intellect, then the consequent logical deductive links between the concepts will correspond to causal links between things. In this way, the underlying structure of the world is seen to be one reflected in necessary deductive links. This conflates (in a way unsatisfactory to empiricists such as Hume) causal connections with logical necessity so that: if *A* causes *B*, then *B* is logically deducible from *A*.

It is vital to understand that Spinoza thinks that the intellect can ideally attain a system of concepts which represents the underlying nature of the world as a whole; and that a complete explanation of the world would be constituted by laying out all the deductive logical interrelations between these concepts.

Spinoza's concept of God is not one of a transcendent God who stands outside the world; Spinoza writes of "God or Nature" (*Deus sive Natura*); God is to be identified with the totality of the universe. Spinoza's view of God is sometimes regarded as pantheistic. The totality of the universe includes more than that which is material. God is infinite and unlimited; unless one contradicts this, there can be

nothing which is not “in” God; that is, there is nothing which is not dependent on God both ontologically and for its explanation. There can only be a single substance; there cannot be a plurality of substances. Substance in Spinoza has upon it the extremely restricting definition that it must be completely self-caused (*causa sui*) and must be entirely self-explanatory; and this eliminates the traditional distinction with respect to *true substance* between having necessary and contingent properties; that is, necessary properties given by an essence or definition, and accidental or contingent properties, derived from the conception of another thing that is an external cause; to be a true substance all its states must follow necessarily or deductively from its essence or definition, otherwise it would not be completely independent in being its own complete explanation. Spinoza identifies true substance with God or the totality of nature because only that can satisfy the conditions of a true substance by being fully the cause and explanation of itself; it satisfies these conditions simply because, by being the totality of what there is, there is nothing else that is required to be, or could be, its cause or involved in its explanation.

To suggest that there could be two or more substances would be to suppose the following.

- (i) To suppose something—assuming that everything has to be rationally explicable—outside the plurality of putative substances which explains the plurality; but then this contradicts the definition that true substance must be entirely self-explanatory.
- (ii) To suppose that a substance could be limited; but limitation entails that part of the explanation, and thus of the cause, for the substance being as it is does not lie within it, but depends on another thing outside it explaining its limitation; but then something limited like that could not be a true substance because true substance is by definition fully self-explanatory.

There are two alternatives here in talking of a plurality of substances: there could be two or more substances with *different* attributes or essences, or two or more substances with the *same* attribute or essence.

- (a) The possibility of there being two substances with different attributes is ruled out by the definition of God as having all attributes; God, as it were, uses up all possible attributes, so if there is a substance other than God, it must have the same attributes as God.
- (b) So if there is more than one substance, then those substances must have the same attributes.

Spinoza therefore aims to show that there cannot be two or more substances with the same attributes—the same essence. If they differ in attributes, then we have two substances with different attributes,

which is not what we are looking for. If two things differ only in mode, and modes are modes of substance and not themselves substances, then a difference merely in modes does not mark a difference in substance; since we are by hypothesis dealing with a difference only in mode, and not in attribute, the modes must be modes of the same substance; two things that differ only in mode are therefore essentially the same, and are not therefore different substances.

Moreover, we would have no reason to regard "two things" with the same attributes—differing merely numerically—as two; for there is no sense in which they could be distinguished, since all their features are dependent upon their attributes, or essence, which are here posited to be the same; a difference in modes would involve a difference in attributes in the case of true substance, since all its features must depend only on itself; this means there cannot be two true substances differing only in mode and not in attribute as well.

There cannot be a difference in substance apart from a difference in attributes, so there cannot be two substances with the same attributes. But there cannot be two substances with different attributes either, because of the definition of God as a being of infinite attributes. So there cannot be more than one substance.

Hence, true substance is utterly *causa sui*, cause of itself, and for this to hold true, there can be only one substance. This unique unlimited substance must have infinite attributes—that is, all possible attributes—each of which is infinite in its kind. True substance is God or Nature, and is theoretically conceivable in an infinity of ways, of which our intellect truly grasps just two: we conceive the world under the attribute of *thought* or under the attribute of *extension*; these are what the intellect perceives of substance as constituting its essence. Thus Descartes' two "created substances", mind and matter, are properly seen as attributes of the one substance, not themselves two substances.

The notion of something being the cause of itself (*causa sui*) may seem incomprehensible. For *A* to cause itself to exist would seem to involve *A* existing before *A* exists. But the notion of causation involved here is that of logical deduction; the existence and nature of *A* is caused by *A* in the same sense as the theorems of a geometry follow from the axioms; and here the sense of *following from* is entirely non-temporal; it does not involve succession in time, but rather a non-temporal logical relation.

The notion of two attributes is partly understood as two perspectives on the same thing—analogue to two sides of the same coin—but here the "perspectives" are intellectual, not spatial, points of view. There are two systems of concepts which represent or express the order of the same thing in two ways, such that each way of talking is irreducible to the other; explanations in both systems or schemes take place by logical deduction using the concepts within that system only;

the two systems of concepts, within each of which there are logical links, are irreducible one to the other; they are incommensurable. They are two completely autonomous ways of looking at the same thing.

All that we observe in the world as particular things are either modes of the attribute of extension (physical things) or modes of the attribute of thought (ideas, which make up minds); all things are thus a determinate expression of the essence of God. Infinite modes are those features that are common to all modes that fall under a certain attribute: motion and rest in the case of physical particles, and ideas in the case of thoughts. Finite modes are the more particular features of the world. Thus an infinite mode under the attribute of extension would be described by a law of nature that applied to all physical things, whereas a finite mode such as the red of this book is a particular feature of the book and is not a feature common to all physical things. The explanation of the existence and nature of particular modes derives either from the essence of that mode, something that lies within it "in so far as it is in itself", or something external to that mode, something that lies outside it. God or nature as a totality is the only thing which has within it the complete explanation of its existence and nature; all other things are modes which are determinate cases of God expressed under the attribute of either thought or extension, and to varying degrees their explanation lies outside such modes; but in any case the full explanation must ultimately be traced back to the nature or essence of God.

This begins to move us from metaphysics to epistemology. Spinoza thinks that the logical order of ideas (their logical relations) is the same as the connection of things (their causal relations). The perfect, or fully "adequate", understanding of the world would be attained if we could see how everything was deducible from the essence of God. We would then see how everything in the world follows by *logical necessity* from God's eternally fixed nature. This is more than determinism: it is necessitarianism. One might have a variety of sets of axioms from which different theorems could be deduced, which would constitute their explanation or proof. But these proofs are conditional or hypothetical in that they depend on the acceptance of the axioms: *if* one accepts the axioms, *then* the theorems follow by logical necessity, so that to accept the axioms (premises) and deny the theorems (conclusions) would imply a logical contradiction. In the completely adequate science of the world (falling under the attributes of extension and thought) there is only one possible axiom set: the essence of God. So the world is not explained in conditional truths deduced from a set of basic truths which we might reject in favour of some alternative set; the world follows unconditionally from God's nature, which it would be absurd to suppose could be different from what it is. God is perfect, so any change in God would produce imperfection in God; God cannot be other than what He is. On similar grounds Spinoza opposes final

cause or purposive or teleological explanations. God's nature stands immutably and eternally the same; it stands outside time. So this world not only follows in every detail, when properly understood, with logical necessity from God's nature, this world is also the only logically possible world. Not only is each link in the series deductively connected with other links, the series itself is the only logically possible series—the series itself as a whole is logically necessary. Presumably this means any other series, and hence world, would produce within it a logical contradiction.

The notion of a completely perfect conception of the world derives from Spinoza's doctrine of "adequate ideas". The world, and features of it, are always viewable under its two expressions of thought and extension; these two worlds run in irreducible parallel; they are isomorphic. From this metaphysics it follows that for every idea there is a corresponding physical correlate, an *ideatum*. This does not mean there cannot be false ideas, since truth involves more than mere correspondence of an idea to some *ideatum*; the idea must also be an adequate idea; this involves more than the external correspondence to the object the idea purports to be an idea of; it must also represent the true nature of the object represented. It is clear that Spinoza is using the term "true" in a way different from common usage. For an idea to be true in Spinoza's sense it must not only correspond to the facts, but must also be known to be true and one must know the nature of the object to which the idea corresponds; only then is an idea said to be adequate and true. Thus falsity is a privation of knowledge; although an idea that failed to correspond to the facts would also be false. To have an adequate idea of X involves understanding X, that is, knowing the causes of X being as it is; this involves explaining X by deducing it from other adequate ideas. Ultimately the chain of adequate ideas is traced back to axiomatic necessary truths and concepts called "common notions". An inadequate idea is like a conclusion without premises. An idea is more or less adequate in so far as it fits into a more or less general system of explanation; the system will be more general and powerful to the extent that features of the world can be unified and deduced from it by deductive reasoning. An idea becomes more adequate—thus adequacy is a matter of degree—by fitting as a deducible conception within an ever wider, and more inclusive, unifying, explanatory system. Complete adequacy would involve fitting in the idea or conception deductively with the system describing the order of the totality of things; ultimately this is the ideal system contemplated by God. The completely adequate system of ideas will ultimately be deducible from universally acceptable "common notions" that are seen as evident by intuitive reason: these are the axiomatic necessary truths and basic concepts of Spinoza's science and metaphysics that comprehend or constitute the logically necessary and essential features of the universe.

An adequate idea gives an intrinsic mark of truth, as distinct from the extrinsic mark whereby an idea merely corresponds to its object; a completely adequate idea does not merely correspond to its *ideatum*; it presents to us the true nature of, or understanding of, its *ideatum*. A false idea is one that is inadequate; we know it corresponds to an *ideatum*, but it will misrepresent, and fail to explain, the nature of that *ideatum*, by failing to place the idea in the deductive system of explanation which is constituted by a coherent system of ideas that represents the true order of things. To have an adequate or true idea of *X* is to understand *X*, which is to explain *X*, which is to know the causes of *X*. The criterion of truth is given by features of ideas or propositions themselves and the logical relation of proof between them, and not by a mere comparison of ideas and the world; the determination of what is true and what we know about the world is available to us within the circle of ideas themselves in the form of intuitions of reason giving “common notions” and necessary logical deductions from these notions. At the level of completely adequate ideas there turns out to be an exact agreement between ideas and reality.

We can use a spatial perspectival example to understand the notion of the completely adequate science. What I now see is in a way true only from my perspective, my point of view; if I moved, or if I were different biologically, what I see would be different—my view is in this way particular. The aim of an adequate understanding is to see things from no point of view; that is, to subtract all those features which make my point of view mine or a mere point of view. The intellect already provides us with such radically non-perspectival truths: $2+2=4$, for example. This is true from all points of view; its truth is unconditional in not depending on any qualifying reference to a perspective. Such is the nature of fully adequate ideas of the world; these are found in rationally universally valid “common notions” and deductions from them.

This rules out sense-perception as a means of attaining adequate ideas of the world; we are to aim for an intellectual conception of the world freed from the mixing of things in the world with their effect upon us in terms of bodily processes. When we observe the sun, the *ideatum* of the idea we have we confusedly think is the sun itself, whereas the *ideatum* is really, in the sense of its physical correlate, that bodily process corresponding to the perception of the sun, which is a result of the effect of the sun on us. This is not a great problem provided we come to understand the nature of our perceptions themselves; in isolation the ideas of perception are not false, but may become so—hence they are inadequate or untrue—when placed within a wider explanatory context. A true, and thus adequate, idea, of the sun as it is in itself will be approached by its deduction from other ideas as part of a general science of physical things, the concepts of

which are grasped by the intellect, and this will replace the “false”, inadequate, idea of sense-perception. The completely adequate system of ideas places each idea in a totality of ideas such that the deductive relation of the ideas represents the true order of causes in the world. This is the world as understood by the intellect of God, who is identical with the world.

Ultimately Spinoza’s completely adequate view of the world is *sub specie aeternitatis*—the view from eternity, from outside time, from no point of view. This is opposed to *sub specie durationis*—the view of things as happening in time. God has such an eternal, non-temporal view of the world; it should be our aim to participate in such a view. We already have such non-temporal universal truths in mathematics and geometry; it is senseless to apply time or duration to the truth $2+2=4$; it is more than always true, its truth lies outside time altogether, in eternity; the concept of duration has no application here at all. Spinoza thinks that a true, hence completely adequate, explanation of the world can be attained only through a view which is similarly *sub specie aeternitatis*; the view outside time is the final step in ridding a conception of all perspectives; one would then have the eternal, necessary, *a priori* deductive explanation for everything. Some of these truths we can grasp; but our finite minds enable us to grasp only a small fraction of them.

There are three levels or kinds of knowledge. The first kind of knowledge is sense-experience, the second kind of knowledge is deductive reasoning, the third kind of knowledge is immediate intuition of reason.

Sense-perceptions can be useful in giving us limited knowledge of particular facts and in the forming of inductive generalizations. Our finite minds cannot trace the infinity of causes that would give us fully adequate ideas of the objects of sense-perception. Our finite minds cannot cope with the infinite complexity of deducing truths concerning finite modes (“A red book is on my desk”) all the way back to the essence of God. Knowledge of the third kind, intuitions of reason, is the highest form of understanding. There we not only have ideas giving logical explanations by being related deductively to premises, as in the second kind of knowledge, we also simply grasp the proof complete in one intellectual act by seeing the rule in the instance. In the case of sense-perceptions, we are presented with one inadequate, fragmentary, logically unconnected idea after another (which is correlated with inadequately understood states of the body) with no real possibility of the order of presentation reflecting the true order of causes. Sense-perception is not needed and cannot give knowledge of the essence of things; in so far as we do not distinguish a thing from its essence, we can deduce its nature from its definition.

Sense-perception can give knowledge *that* but not knowledge *why*, which involves deducing the necessity of that perceived to be the case.

Nevertheless, sense-perception presents a low-level sort of knowledge since it can satisfy what seem to be Spinoza's three conditions for knowledge that p :

- (a) p corresponds to what is the case
- (b) there is no reason to doubt that p (that is not to say p cannot be doubted)
- (c) there is a good reason to assert that p is the case (it is not a guess).

Sense-experience as the ground for the assertion of either particular facts or inductive generalizations seems to satisfy these conditions. Knowledge in its highest senses of the second and third kind, which involve deductive proof or logical necessity, clearly satisfies the above conditions for knowledge, but to a higher degree.

The third kind of knowledge is the kind of understanding God has of things in their totality derived from "common notions". God's view of the world *sub specie aeternitatis* telescopes down the process of deductive reasoning involved in comprehension of the totality of the world to one intellectual "point". Time is thus ultimately unreal from a God's-eye point of view. The ultimate explanation of the world lies within the world; the world is fully explicable as a self-contained system.

The general metaphysical conclusions are reflected in the Spinozian response to the mind-body problem: ontological monism (a single substance) is combined with a conceptual dualism (double-aspect). A human being is viewed as mind or as body—these are two aspects of the same thing; indeed, the *ideatum* of the mind is the human body. This does not mean one is always conscious of one's body; it alerts us to a dual use of "idea of" in Spinoza. First, there is that derived from ideas being expressions in thought of that which is expressed under the attribute of extension; second there is the sense in which I have an idea *about* some object. In the case of an idea of a table there is the first meaning of the "idea of" the table, in the sense of the idea being an expression in thought of some state of my body affected by the table (that which may be involved in seeing the table); there is the second, different, meaning of "idea of" in the sense of my idea being about the table—its content or object is the table. In this second sense ideas are said to be active and to exhibit intentionality: they point beyond themselves to an intended object.

There can be no *causal* relation between mind and body; mind concepts and body concepts are incommensurable so that logical deductions, and hence causal laws, which included talk from both ways of conceptualizing substance would be senseless. The relation between the two systems of concepts is like that between two autonomous languages which can say or express the same things each in its different way. There is some relation between mind and body: it

is the correlation between determinate states of two attributes of one substance. The complexity of thought of which a mind is capable is therefore directly matched by the complexity of the body; a human being is capable of complex thought processes, and this has its correlate in the complexity of the human body. This means that although every physical mode (*ideatum*) under the aspect of extension has its corresponding idea, most things lack the necessary complexity to be capable of conscious thought. Spinoza is not committed to stones or chairs thinking; but the difference between them and us is only one of great degree.

A human being is one kind of finite mode of the one infinite substance. What gives meaning to the notion of any finite mode having limited individuality is our *conatus* (striving, endeavour or power): the endeavour to maintain its integrity or persist in being against the effects of external causes. The nature or essence of a finite mode is that without which it would cease to exist as what it is even as a qualified individual, and would collapse under external causes. In so far as the states of a thing are deducible from its nature or essence, that is the *conatus* or power of that thing in self-preservation. This will vary in degree and kind. The greater the *conatus*, the more self-dependent it is and the more that through its essence, it expresses power of self-preservation, power which is ultimately derived from and expresses the power of the only truly independent individual, God. Higher level finite modes such as organisms obviously exhibit *conatus*: they try to persist in being what they are—a man, a dog—with some degree of individuality. The greater our *conatus* the more we realize our essence as rational beings; but this seems to produce a conflict with our individuality, for we then have a view from which we appreciate our connectedness with the whole of nature. No finite mode can be ultimately self-explanatory of course, but the degree of independence is determined by the balance between the derived “active” (internal) explanation of its states and the “passive” (external) explanation of its states.

A result of this is that no thing can be the cause of its own destruction; the destruction of a thing is always through an external cause. This is because the *conatus* of a thing is its essence, and its essence revealed in a definition affirms what it is; thus in so far as a thing is considered only in itself, in virtue of its essence, it cannot be destroyed as that thing. This seems to make suicide impossible. But Spinoza can answer that suicide is a case of being overwhelmed by external causes. However, cases of rationally defensible self-sacrifice complicate matters; the answer relates to Spinoza’s conception of freedom as acting in accordance with universal rational principles.

Freedom does not consist in our being able to do otherwise than we do; it is not contrasted with necessity; it is understood in opposition to constraint. Everything that exists is necessary either by reason of its

essence or by reason of an external cause (another finite mode); everything that does not exist is impossible either by reason of its essence containing a contradiction, or for want of an external (efficient) cause. The external chain of causation is ultimately necessary by deriving from God's essence; the impression we have of contingency is merely the consequence of ignorance of causes. We are free in so far as the explanation of what we do derives from our conative disposition to behave in certain ways, as our essential natures meet each situation. The exact nature of the *conatus* will vary between organisms. There is nothing that is good or bad in itself; things are good or bad only in relation to some conative disposition; things are good or bad for someone or some kind of thing. Everything is free "in so far as it is in itself": that is, in so far as the explanation for what it does is derived from its essence, which determines what it is. In this sense God is absolutely free; not because what follows from His nature could be any different from what it is—not because He could have "acted" otherwise—but because God is totally self-determined, and thus totally unconstrained. We are in a state of bondage in so far as we are the slaves of external determinations and circumstances. This does not mean we should live without emotion, but we should, in order to be free, have *active* emotions following from reasoning; we should control our *passive* emotions which are derived from external causes. In so far as a man is externally caused, he acts under the influence of inadequate ideas, failing to see how events must follow by logical necessity from one another. The free man acts under the dictates of reason, by the active causal determination of an internal logic; the principles of reason are *universal*, thus in so far as we act because of reason we make ourselves free in virtue of acting from causes independent of particular circumstances.

This returns us to adequate ideas and their metaphysical connection with Spinoza's search for human happiness, contentment and freedom. To understand this we have to remember that Spinoza conflates logical and causal necessity. In so far as we entertain adequate ideas, our ideas follow one another by their internal logic, a logic that is independent of external causes. The explanation for the occurrence of one idea, in so far as it is adequate, will be found in its logical deduction from previous ideas; this gives a logical and causal integrity, a self-sufficient, self-contained system based on universal rational principles independent of external explanations and hence external causes. There will be some bodily equivalent to this mental aspect of human beings and in this sense we are free. What human *conatus* ultimately seeks to preserve is this power of self-determination itself. It reaches its highest degree when ideas are *sub specie aeternitatis* because such ideas are absolutely necessary and universally true.

We are free when we act according to reason because the dictates of reason are necessary, universal, categorical and thus independent of

context or particular situation. We act independently of contingent particular external causes and circumstances if we act by reason: we are then free.

Passive human emotions are controlled by reason to the highest degree under the third kind of knowledge; for then the truth I grasp is not an abstract deduction, but is intuited irresistibly in the particular case; thereby it becomes not a truth I merely rationally accept, but one that has *force* or *power* to effect changes in my emotional states. The inference has force as well as validity. But since Spinoza is a strict determinist, it is difficult to see what someone can *do* to bring about the attitudes Spinoza thinks desirable; either one will be determined to have them or one will not.

Our aim should be the attainment of a view of the world that is detached and eternal. By striving for the completely adequate view which is *sub specie aeternitatis*, of which only God is fully capable, one comes to see the strict logical necessity of all that happens; all follows from God's immutable nature by logical necessity. We can thus reconcile ourselves to the necessity of things. It no more makes sense to hate a man who hits us than it makes sense to hate a tree that falls on us; although in both cases this does not preclude our trying to do anything about it, like getting out of the way—but we understand the necessity of what happens through reason.

Although there seems nothing we can do to bring about human happiness and peace of mind, they nevertheless consist in having a certain attitude toward the world. The wise man engages in a life of philosophical contemplation studying the rational and eternal: a life of relative independence from the buffeting vicissitudes and unreliability of particular circumstance, one which gives enduring pleasure and grants peace of mind; the troubled mind is alleviated when one views the world and events in one's life *sub specie aeternitatis*. The rational understanding that God is the ultimate eternal cause of all things is what Spinoza calls the "intellectual love of God". To the extent that we entertain conceptions or ideas *sub specie aeternitatis*, we free ourselves from the bondage of time, since such conceptions are absolutely necessary and have no temporal reference; and it is in this that our ultimate happiness lies; to the extent that we do this, we participate in God's eternal vision and the eternal existence which is God's existence.

Leibniz

Gottfried Wilhelm Leibniz (1646–1716) was the son of a Professor of Moral Philosophy at the University of Leipzig. Leibniz's early education, with a Lutheran religious background, would have involved the study of Latin, Greek, theology, and Aristotelian logic.

He graduated from the University of Leipzig in 1663, and gained his doctorate in 1666 from the University of Altdorf near Nuremberg. He began his employment with the Baron of Boineburg who was first minister to the Elector and Archbishop of Mainz, but in 1667, following the death of Boineburg, he moved into the service of the Duke of Brunswick in Hanover. One of his major duties was that of librarian. Between 1672 and 1676, Leibniz was on a diplomatic mission in Paris, which was at that time the centre of European intellectual activity. There he met important thinkers such as Malebranche, Arnauld (with whom Leibniz corresponded extensively), and the physicist Huygens. Huygens, recognizing the talent of Leibniz, set about improving Leibniz's mathematical knowledge. In Paris Leibniz would have been fully apprised of Cartesian philosophy. In 1673 Leibniz visited London, where he met the chemist Boyle and the Secretary of the Royal Society, Oldenburg; on this visit he also became acquainted with the materialism of Hobbes. In 1676 Leibniz went to Amsterdam in the hope that he would find, in the work of Spinoza, answers to some of the problems he perceived in Cartesian philosophy. He spent a month there; some of the time was spent reading Spinoza's *Ethics*, some in discussion with the ailing Spinoza.

There were many influences on Leibniz's philosophy; apart from those already mentioned, he was impressed by Plato's *Phaedo* and *Theaetetus* and well acquainted with scholastic philosophy (derived from Aristotle)—for example the notion of substantial forms.

Leibniz was a stupendous polymath, active in almost every imaginable area of inquiry, from geology and mining engineering to philosophy, mathematics and logic. He was indeed a mathematician of genius, and discovered independently, and simultaneously with Newton, the infinitesimal calculus. His fertility of mind left an array of unfinished projects. Leibniz was a man capable of bouts of intense intellectual activity; he is said to have spent several days at a time sitting working at his desk—even sleeping in his chair. He suffered from intellectual isolation in Hanover, where he spent most of his time. During Leibniz's lifetime there were few academic journals, and letters were the chief means of exchanging ideas. Leibniz's correspondence is massive involving over 1,000 correspondents; in any single year he frequently wrote to more than 150 people. He hoped that one day all reasoning in various fields of inquiry could be united in one system, a universal calculus of all reasoning, which would eliminate fruitless disputes; answers to disagreements could be settled simply by calculation.

Leibniz never married; he proposed, but the woman hesitated long enough for him to think better of it. He was of medium height, with sharply intelligent eyes; he had broad shoulders, but stooped and had weak lungs. The last years of his life were ones of loneliness and

neglect. No member of the House of Brunswick bothered to attend his funeral.

The philosophy of Leibniz is not like a building based on unshakable foundations, it is more like a platform kept in balance by constant adjustments to the weight put upon various fundamental logical principles. These basic principles in Leibniz's philosophy are logically interconnected; and for this reason it has no definitive starting place.

In Leibniz's philosophy there is an intimate connection between metaphysics and the fundamental nature of logic. This is a view which has ancestors and heirs: it suggests that conclusions in and about the basic structures of logic lay bare the basic structures of the world. Certain important truths derived from logic are seen by Leibniz as having consequences for any attempt to explain the *fundamental* nature of the world which is studied in metaphysics. Probably the best approach to Leibniz is to state what the basic truths of his thinking are, and then proceed to see how he uses them to solve certain philosophical problems. There are five major basic principles in the philosophy of Leibniz.

- (1) *The predicate-in-subject principle: the nature of the proposition*
This "*in esse* principle" holds that, in *all* true propositions that which is predicated of a subject is contained within the concept of the subject. All propositions are ultimately reducible to the subject-predicate form. This gives a theory of truth in which in all and only true propositions the predicates are contained in the concept of the subject; all analytic propositions are true and all true propositions are analytic.
- (2) *The principle of non-contradiction*
This asserts that propositions p and not- p cannot both be true, and that any proposition that implies a contradiction is necessarily false; and any proposition whose denial implies a contradiction is necessarily true.
- (3) *The identity of indiscernibles*
This says that there cannot be two entities which have *all* their properties in common. Entities which are identical in their lists of qualities are the same entity; they are indiscernible.
- (4) *The principle of sufficient reason*
There must be a sufficient reason (complete explanation) why everything in the world is just so and not otherwise, even if we cannot know what that reason is. There are to be admitted no inexplicable truths about the world.
- (5) *The principle of perfection*
Those propositions which describe the most perfect world—the best of all possible worlds—are true. This amounts to saying that God creates the most perfect world He can and it involves the

notion that the most perfect world is "simplest in hypotheses and richest in phenomena"; God maximizes both plenitude or variety of phenomena and order or simplicity of explanatory hypotheses.

Leibniz makes a fundamental distinction in his logic between "truths of reason" (necessary or eternal truths) and "truths of fact" (contingent truths). Truths of reason are those truths which, by a finite analysis, show that their denial produces a contradiction, that is, an assertion of (p and not- p). To assert a necessary truth is, on analysis, to assert an identity. The analysis is a process of definitional substitution: for example, $1+1$ being substituted by definition for 2 . Thus, to assert $2+2=4$ is ultimately to assert $1+1+1+1=1+1+1+1$; to deny $2+2=4$ would obviously produce the contradiction that $1+1+1+1 \neq 1+1+1+1$. To allow that (p and not- p) could be true would be to threaten the possibility of all meaningful talk, since we would fail to make the most basic distinction required for any such talk, that between assertion and denial. The assertion that p , and its denial, not- p , cannot simultaneously be true. Truths of fact do not, if denied, entail a contradiction; to deny "Alan is wearing a green shirt" does not seem to involve any contradiction. Truths of reason are necessary truths in that they could not be otherwise; they must be true; in any possible world these truths must hold. Truths of fact are contingent, they could have been otherwise; they might not have been true; there could be possible worlds in which these truths do not hold. Leibniz accepts that truths of reason can be known independently of any sense-experience, *a priori*; whereas truths of fact can be known only through examining the world, *a posteriori*.

Leibniz argues that although the meanings of the terms of a language may to some degree be a matter of arbitrary definition, this does not mean that either the contingent or the necessary truths expressed in a language are dependent on contingent facts about language; the only thing that is contingent is the particular form the *expression* of such truths takes, not the logical status of the truths themselves as either necessary or contingent. This distinction between the truth expressed and the form of expression of a truth is particularly important in the case of necessary truths, which he sees as eternal and objective.

At first sight Leibniz's philosophy can seem obviously false; some of the basic principles listed above, far from being universal truths, seem plainly false when applied to the world. For example, surely it is *possible* (probable even) to have two identical objects? Surely it is far from obvious that all truths are true in virtue of the predicates being contained in the concept of their subject? It becomes clear, however, that what Leibniz is applying the basic principles to is the *underlying structure of reality*; this reality is a metaphysical reality that stands behind the world as it *appears*; it is grasped by the intellect by an

inexorable logic as the way the world is and *must* (necessarily) be at its most fundamental level if the most basic truths of reason are to hold. If we accept Leibniz's basic principles, then he argues that the nature of reality is not how it appears to be, but really quite different. This is to characterize substance, or the really real.

The examination of this underlying structure can begin by considering substance. In Cartesian philosophy there are two "created substances": mind and matter. In Spinoza there is just a single substance: "God or Nature". What the Cartesian view seems to leave out is an account of the individual, or identity. As we look around us it seems obvious that some things are separate individuals capable of remaining the same *individual kind* of thing while undergoing change, whereas other things are merely "heaps" or collections of qualities with no intrinsic unity. Compare a pile of pebbles, which is not a kind of thing, with a crab found on a beach. Scholastic philosophy, derived from Aristotle, had sought to take account of this through the notion of "substantial forms". Thus, the soul is the substantial form of the body, for whatever may befall someone, so long as that person exists the soul remains the same soul; without some such notion we cannot make sense of someone being young and that same someone being old; any change would, strictly speaking, produce a new entity, not the same entity with a new property. The notion of individuals here aims to do justice to the distinction we make between things which have an intrinsic organic unity as *kinds* of thing, such as men and dogs have, and things which are mere heaps of stuff, such as a pile of pebbles. But in pursuing things that are true unities or true individuals, Leibniz moves a long way beyond the Aristotelian commonsense substantial forms which are natural kinds such as man or horse.

In the case of physical things the identification of real unities (things that remain the *same kind* through change) is relatively unimportant; it is possible to say that all physical things are portions of a single extended substance. In the case of the person as mind, individuality becomes of pressing concern; identity in this case is of vital importance. Spinoza challenges the Cartesians to provide a principle of individuating minds; if the only essential attribute of mind is thought, it is difficult to see how there can be a plurality of distinct mental substances or minds differentiated by essence. Spinoza's conclusion is to deny any sense of individuality as substances to either physical things or minds; they have a limited individuality at the level of modes, but are all modifications (modes) of the one substance, without any ultimate substantial independent unity of their own. Leibniz sides with the Cartesians in agreeing to a plurality of substantial individuals, but makes the claim all-encompassing; for anything in the world to be real, there must be at some deep level true unities or individuals: completely autonomous entities.

This brings us to what Leibniz calls the "labyrinth of the

composition of the continuum", which leads him to his conception of substance, and thus to the ultimate nature of reality. Leibniz has the same general conditions for substance as were found in Descartes and Spinoza: that in considering the nature of the world and our explanations of that world, we must, if we are not to enter into an infinite regress, reach something which is (a) ontologically independent or autonomous, and (b) self-explanatory. Substance is the permanent stuff which stands behind appearances which are secondary or derivative. Things appear to change in the world; the explanation of these changes comes to an end at something that remains the same, otherwise the explanation would go on for ever. What is fully real is completely independent and self-explanatory; the fully real is the ultimate logically unchanging constituent of change and plurality. The explanation for anything, if we are not to regress infinitely by always having to look to another thing for an explanation outside that which we are explaining, must end in something that is fully causally autonomous and fully the explanation for its own states.

Spinoza says that within true substance must lie the full explanation of not only its nature but also its existence; and he contends that there can only be one substance, and that is the totality of reality. Leibniz demands not that a true substance should contain within itself the reason for its own existence, but only that it should contain the reason for its entire nature, that is, all its states.

In Leibniz's view, in giving a rational account of the world, we must give an account of what it is that is the ultimate constituent of reality; that which does not alter through natural change, but is, rather, the constituent of that change and, to avoid a regress of ontological dependence, is not itself subject to natural alteration. Leibniz is searching for that which, with respect to all natural means of change, cannot be destroyed and is without parts, and so is indivisible; the aggregation and dissolution of aggregates of such entities constitute all perceived change and plurality. Leibniz identifies this true substance as a *monad* (a word which derives from Greek meaning "unit alone"). Ultimately we must reach such really independent substantial unities, and each one is a unique kind, not merely a collection of parts; they do not change by natural means, but exist or do not exist all at once. They are perfectly determinate. Such entities are the only way to ensure that we have identified genuine substance; something not ontologically or rationally dependent on any further constituent elements because its existence is all or nothing; each is a unique kind that either exists complete, or ceases to exist completely; as a unique kind, if it changed in any detail, it would cease to exist altogether. The ultimate constituents of reality are an infinity of unique individual kinds called monads.

The "labyrinth of the continuum" problem involves considering the ultimate nature of the world, in particular the nature of matter. If the

world is a continuous whole, then its parts would seem to be unreal arbitrary divisions; if, on the other hand, the parts are real, then the world is not a continuum, but a collection of unrelated discontinuous parts. The aim is to reconcile real wholes which are continuous with real parts that are indivisible. We can consider this as the relation of wholes to parts, and present it as a dilemma: extended whole things are either finitely or infinitely divisible. If extended wholes are finitely divisible, we reach atoms, which are real parts in being indivisible; but then the whole that they make up becomes unreal because it is discontinuous, a mere arbitrary heap of atoms between which there is no intrinsic connection. The suggestion that there are, in addition, forces between the atoms runs counter to atoms being the ultimate constituents of reality in terms of which *all* else is explained and constituted. Nor can the coherence of atoms be explained through an interlocking system of hooks and eyes; anything capable of having hooks and eyes would itself be capable of having parts in need of some internal principle of cohesion. If extended wholes are infinitely divisible, as the Cartesians thought, then the parts are unreal because we have an infinite regress of divisibility; and this gives us a whole with unreal parts. Leibniz argues, against physical atomism, that anything extended must be divisible in principle. The solution in this search for a substance which reconciles the real continuity of the world with the real indivisibility of parts is to exclude *extension* from among the qualities ascribed to substances: the most basic entities of the world. Anything that can be divided would cease to exist as one thing, and thus would be subject to external causes, and could not be a true substance.

Ultimate substances are monads which have no extension; they are purely qualitative (intensive), and have no quantitative (extensive) properties; they are independent in all respects except for their existence, for which they depend on God, and they are simple in being without parts; they can be destroyed only by total annihilation (or miracle), not natural change, for natural change is the constantly changing aggregation of monads. This notion of substance is derived by analogy from the non-spatial "I" or "soul", for it is this that remains the same through all the changes in our lives, so that we retain our identity. Monads are the unchanging constituents of all natural change, in that anything that happens in a monad is a product of its own indwelling nature. There is an infinity of monads, each of which is a unique individual kind in virtue of being identified by a unique infinite list of predicates giving all its properties.

Leibniz conjoins the contingency of existence with the principle of sufficient reason to give a proof of the existence of God. For every fact or truth there must be a sufficient reason. Granted that something exists, there must be a reason why something exists rather than nothing; this reason cannot lie within the series of existing finite

things, for we would never among existing things find something whose existence did not itself require further explanation. We must find such a reason outside the world in a logically or metaphysically necessary being—a being whose existence is not contingent—which is the sufficient reason for its own existence. Another way of putting this is to say that although the state of *A* is explained sufficiently by reference to state *B*, so that we can explain this or that state from within contingent events within the world, we cannot from within the world of things with states explain why there are things with states at all, why there are any states whatsoever. This argument relies on the principle of sufficient reason having unlimited application; we might instead be prepared to argue that “Why is there something rather than nothing?” or “Why should there be anything at all?” is a question which does not have an answer; it is a brute fact beyond which we cannot go.

The world as it appears to us as matter in space and time is a set of “well-founded phenomena” (*phenomena bene fundata*); the world as it appears is our misperception of qualitative changes in the world of monads; the world of appearances is secondary, and derived from the underlying reality of an infinity of self-subsistent, self-explanatory monads which are without parts. This solves the problem of reconciling the continuity of the whole with the indivisible (simple) reality of the parts: the whole is a plenum or continuum in virtue of the adjacent monads differing infinitesimally from each other, and the parts are real in that monads, being unextended, are indivisible.

Given the conception of true substance as monads, we can now begin to apply to the world the basic principles of Leibniz’s philosophy listed above. Monads, as true substances, must—except for their dependence on God for their existence—be independent of all other things, and must be completely self-explanatory; monads can be both these things by all that is true of them being true analytically. Each monad is its own *complete concept* in that it contains within its essence the list of *all* the predicates, past, present and future, which are true of that individual monad, apart from its existence. God is the only substance that exists in conjunction with all possible worlds, for unlike all other substances, that God exists is analytically part of His complete concept or essence. Although the existence of all monads except God is contingent, Leibniz sees no sense in the distinction between accidental and essential properties of substantial individuals; all properties are equally essential in being deducible from the complete concept of the monad; and substantial individuals are individuated only through considering their whole being or complete concept.

Leibniz thinks that Spinoza confuses determinism and extreme necessitarianism. While, according to the principle of sufficient reason, everything in the world must be fully determined—there must be something which is sufficiently the reason for the way it is—this does

not mean that this or any other deterministic world is the only possible deterministic world. That would involve confusing necessary and contingent truths. Leibniz makes the distinction, and derives it from the idea that all propositions are ultimately reducible to the subject-predicate form; a true proposition is such that the predicate is contained in the concept of the subject.

Necessary truths (truths of reason), such as $2+2=4$, are those whose denial, in itself, implies a contradiction; they are unconditionally true in all possible worlds; they have an absolute or metaphysical necessity. Contingent truths (truths of fact) are those whose denial does not in itself imply a logical contradiction; they are, however, conditionally or hypothetically necessary when they are logically implied by some other true proposition from which it would therefore be a contradiction to deny they follow. Contingent truths (such as "Caesar crossed the Rubicon") are conditionally necessary truths, given that the individual monadic substance (Caesar), of whom the truths are predicated (crossed the Rubicon), *exists*. A proposition is *conditionally* necessary (contingent) if its denial is not a contradiction in itself, but there is some other proposition from which it logically follows. A proposition is *unconditionally* necessary if, by finite analysis, its denial is a contradiction in itself.

Unconditionally necessary truths (truths of reason) hold across all possible worlds, and cannot determine which of the infinity of possible worlds is actual. The principle of non-contradiction is sufficient to account for metaphysically necessary truths, although Leibniz also thinks such truths are eternal objective truths in being in the mind of God. But in the case of contingent truths a further reason is needed to account for why certain truths are actualized and not others. Truths are contingent because God was not ultimately logically compelled by the principle of non-contradiction to actualize those truths. The *further sufficient reason* for contingent truths—what among the non-necessary possibilities God actualizes—is found in the principle of perfection. God creates the best, or most perfect, of possible worlds from a choice of infinite possible worlds; the actual world is the one that maximizes compossibles. All possible truths strive to be actual truths in that they will be actual truths if their being true does not contradict the actualization of some other possible truth. The principle of perfection is the general test for truths of fact: the actual world is the one that maximizes both plentiful variety (diversity) and order (simplest laws). Existence is taken to be a perfection by Leibniz. All truths ultimately refer to truths about the underlying monads, so all truths are eventually analytic in that the predicates are contained in their subject; but in the case of contingent truths this analysis is infinite, because to show analyticity is equivalent to showing how that truth fits into the most perfect world.

The principle of perfection gives us a criterion of truth for choosing

scientific laws: we should choose the law that explains the greatest variety of phenomena with the greatest unifying simplicity.

Being true substances, monads are their own complete explanation, except for the explanation of their existence; thus everything that is true of them is true analytically; they are fully independent; so there can be no causal interaction between them. Nevertheless, things in nature appear to interact. This appearance is accounted for by Leibniz's notion of *pre-established harmony*. Leibniz denies causal relations involving necessary connections between phenomena or between the monads; he replaces these with pre-established harmony and causal laws with functional relationships; in science we are simply concerned with the determinate way one phenomenon varies in relation to another. It is these functional relations that constitute laws of nature, not some mysterious further notion of necessary connection. Just as the existence of any monad is always contingent, and there is an infinity of possible worlds, so there is an infinity of possible laws or orders of nature. The only true causes, apart from God, in the sense of producing deductive explanations, are the states of the monads derived from within each monad itself.

Each monad is completely self-contained, but in a more or less confused way every monad mirrors the entire universe. The mirroring of the universe gives each monad a unique point of view; these constitute active states of the monads which are "perceptions"; the tendency to change between these perceptions is termed "apperception". The spontaneity of changing states of the monads reflects Leibniz's concern for dynamics; that an essential property of substance must be force or activity, contrary to the inert extended matter of Descartes. The monads have "no windows" through which anything can come in or go out; monads are substances and there can be no interaction between substances. God's initial choice of what set of monads to create arranges things so that the subsequent states of the monads are perfectly coordinated or harmonized in accordance with certain laws. This is analogous to two clocks being set at the same time: they always strike correctly together at twelve o'clock and at all other times on the hour even though they do not interact. God, in choosing this world, arranges a perfect coordination of all its monadic elements. Each monad has within it an active force whereby its states unfold. This harmonious coordination of the monads involves a mirroring by each monad of the states of *all* the other monads, which means that a change in any one monad would entail a completely different universe, for adjustments would have to be made in the systematic arrangement everywhere else. The universe is a plenum; the plenum of space corresponds to the infinitesimal qualitative differences between monads which are perfectly compacted.

The world as it appears to us in space and time is a set of "well-founded phenomena" rather than a mere illusion; that is, the world of

appearances is *systematically* underpinned by states of the monads. Appearances are correlated with something that is ultimately real. Great distances in space are correlated with great qualitative differences between monads, small distances with the reverse. Time is correlated with our perceiving the unfolding of the states of the monads. All apparent relations are reducible to truths about individual monads. So we can say that the relation of *A* being heavier than *B* is reducible to a truth about *A* weighing five tonnes and a truth about *B* weighing one tonne.

We can now see why the identity of indiscernibles applies universally, as Leibniz suggests. Leibniz's principles apply to the ultimate nature of the world, not to things as they merely appear. It may be suggested that we could have two substances with identical sets of true predicates, but at different places in space. But space, as well as time, is itself something derived from truths predicated of the monads. Once we see that *all* true predicates describing all states whatsoever are contained within the ultimate monadic elements in the universe, we see that there could not be two substances with identical lists of predicates; there would be nothing left in virtue of which they could be distinguished.

Leibniz's view of the world can be summarized as follows. All reality is made up of an infinity of soul-like monads; these are true substances; they are ontologically independent of everything except God, as they depend on Him for their existence, and no two monads are alike. They are independent in the sense that all that is true of them is deducible from their full concept or essential nature. Logically necessary truths are true of all possible worlds in virtue of the principle of non-contradiction alone. Only God is such that a denial of His existence would be a contradiction; the existence of all other things is contingent. Each monad when it comes into existence goes from being an unactualized possibility to being an actualized possibility. But given that God chooses to create particular monads (basic substantial individuals), everything proceeds from the complete conception of those individuals with necessity. Thus some truths are contingent because, although given the creation of individual *A* all that happens to *A* follows with necessity, it is only hypothetical necessity, since the creation of *A* was not itself necessary.

The monads actualized are the reality that underlies appearances which are systematically related to those monads so that the appearances are well-founded phenomena. We explain the appearance of causation and causal laws between phenomena, which all derive from monads, by there being an analogue of strict rules governing the non-causal coordination of the states of the monads.

God cannot choose what is impossible, and any universe must include what is necessary; but among contingent truths—those truths that are neither necessary nor impossible—God chooses from among

the possible, pure essences that are not actualized. There must, however, be a sufficient reason for what God chooses if the universe is to be fully rationally explicable; the reason why God chooses to actualize some contingent possibilities rather than others cannot be found in the principle of non-contradiction, since their non-actualization would not imply a contradiction; the sufficient reason is derived from the goodness of God, which means that, from an infinity of possible worlds, He chooses the best of all possible worlds; a world of maximum plenitude or variety tempered with greatest order or simplicity of explanation.

It should not be supposed from Leibniz's talk of soul-like monads inhabiting everything that everything is thereby conscious. Nevertheless, the distinction between different levels of monads is a matter of degree and is dependent on their level of activity and the clarity of their perceptions. It is in virtue of these factors being at a high level in our case that we have the capacity for reason.

We are monads. The human body is a collection of monads which is dominated by the powerful monad of the human mind: the "I" in us. Leibniz's doctrine of pre-established harmony solves the Cartesian mind-body interaction problem; there is now no mystery concerning interaction for it is only an appearance, but one that is well-founded in the coordination of the monads. The appearance of mind-body interaction is the coordination of the mind-monad and the body-monads, and this is just a special case of monad harmonization. There is no more difficulty in explaining this than there is the coordination between any other monads in the universe; God so arranges things from their inception. The monads that correspond to the telephone ringing are perfectly harmonized with the monad which is myself having the experience of the telephone ringing, without the experience of the ringing being caused by the ringing itself. The intimate nature of the relation between the mind/self-monad and its body-monads, is accounted for by the special characteristics of my perceptions in relation to my body-monads. I am a structured aggregate of monads, structured by the degree of activity and clarity of perception of the monads. The dominant monad is that which has the greatest degree of activity and clarity. Leibniz distinguishes three levels of monads: self-conscious monads; conscious monads; unconscious or bare monads.

A remaining question concerns human freedom. The notion of human freedom in the sense of choosing otherwise at a particular moment seems irreconcilable with all truths concerning substantial individuals, such as particular people, being analytic truths. Although the predicates true of an existing individual are only hypothetically necessary, since they depend upon God's original decree to create *that individual* of which the predicates are true, this does not seem sufficient for freedom. It makes all that I do contingent

in the sense that there is no logical contradiction in supposing that the specific individual that is me might not have been created at all to do what I do. But, given God's decision to actualize the possible pure essence A , and thereby create monad A in particular, then its states, $(a, b, c\dots)$ follow necessarily or deductively from the complete concept of A . The existence of monad A is itself contingent—it is not contradictory to deny that A was brought into being or actualized—so any particular state of A , say c , is contingent in that “not- A ” is not a logical contradiction. There are possible worlds in which A might not be true because A might not have been actualized—brought into existence—at all, but instead A . But we do not say that people are free if it is a mere logical possibility that what they do might not have been done because *they* may not have existed at all. When God decides to create an individual monad A , this means creating the complete concept from which all truths predicated of the subject A follow deductively from analysis of—are contained in—the concept of that subject; thus to change any of these truths would be to change the complete concept and thereby destroy that individual as *that* particular individual and create another individual. It seems that I could only be free by controlling my complete concept; but only God has this control at the inception of that monad. All that is true of—happens to—an individual in total defines that individual. That Leibniz died in 1716 is a truth that follows necessarily, given the initial creation of that particular individual, that Leibniz had to die in 1716; if this had not happened, we must be talking of a different individual.

A worrying question remains for Leibniz, connected with the problem of freedom. Does the *in esse* (predicate-in-subject) principle apply to God? Does whatever God does follow deductively from His complete concept, including His decrees as to which world to create? If this is so, then the distinction between necessary and contingent truths is in danger of collapsing, because God's decree to create the most perfect world itself follows deductively from God's complete concept; and then what follows could not be otherwise unless God ceased to be God, destroying His own complete concept. It would then be a logical contradiction to suppose God could have chosen otherwise. This threatens a return to Spinoza's extreme necessitarianism.

Leibniz is a rationalist in the sense that he thinks reason can grasp the true nature of reality that lies behind appearances; he is also a rationalist in the sense that it ought *in principle* to be possible to deduce all the states of the world from an analysis of the complete concepts of actualized monadic substances. This *a priori* analysis is also infinite, and not completable by human beings, and moreover refers to an intelligible reality that lies behind appearances and accounts for those appearances, not to the appearances themselves. However, Leibniz's

metaphysics provides only a framework of principles which are vastly too general to allow the deduction of specific scientific laws; and in this sense Leibniz is an empiricist; we can discover specific scientific laws concerning the connection and order of appearances only from observation and experimentation.

CHAPTER FIVE

Empiricism: Locke, Berkeley, Hume

The empiricists in general have tendencies which contrast with those of the rationalists. Empiricists hold that all the material for knowledge, our ideas or concepts, and all knowledge of actual matters of fact, as opposed to logical or conceptual truths, must be derived from, or be reducible to, aspects of our experience: features of the information provided by the content of our senses and introspection. Empiricists deny that it is possible to know by reason alone the nature of what exists; rather, the nature of what exists can be known only through experience. We should reject as meaningless ideas or concepts which cannot be specified as corresponding to any possible experiences. We should reject knowledge claims concerning matters of fact about the nature of the world which are not supportable by the evidence of experience. This leads to a tendency among empiricists to emphasize that the limit of human knowledge and imagination is bounded by the limit of our experience. Empiricists reject the rationalist claim that it is possible to come to know by *a priori* reason alone the nature of an intelligible real world inaccessible to experience that stands beyond appearances. The empiricist may argue that concepts (such as substance), and the terms that express them, are meaningless or else must relate to some possible experience, since concepts and terms get their meaning by reference to some possible experience, but a world beyond experience cannot be a world that might possibly be experienced; in either case it is not possible to use meaningful concepts to talk of a world beyond possible experiences.

The tendency in empiricism is also to deny the existence of natural necessity: necessity is a property only of logical relations between concepts, or of logical relations between ideas or thoughts, not between things or events in the world whose existence, nature and connections are all contingent; such natural contingent connections can be discovered not by reason, which can establish only necessary truths and necessary connections, but only by experience.

Empiricism is inclined to argue that there are two exclusive and together exhaustive types of proposition.

- (a) Propositions whose truth, logically speaking, can be known merely by understanding them, or by deductive reasoning alone, independently of the evidence of experience: truths of reason.
- (b) Propositions whose truth, logically speaking, cannot be known merely by understanding them, or by deductive reasoning alone, but which depend on the evidence of experience: truths of fact.

All propositions which tell us anything about the real or actual world are truths of fact. Propositions stating matters of fact cannot be known to be true merely by our understanding them, or by our deducing them from other propositions known to be true by the understanding alone; if we can know them to be true at all, they must be known through consulting experience. It should be noted that the distinction is not the genetic one of how we come to have, acquire, or understand these different sorts of proposition, but a logical question concerning on what, once acquired or understood, the truth or falsity of a proposition depends, and on what knowledge of the truth or falsity of a proposition depends. If the truth or falsity of a proposition depends only on the meaning of the terms in it, then it is an *a priori* proposition whose truth or falsity can be known *a priori* by reason alone independently of empirical evidence. If the truth or falsity of a proposition does not depend only on the meaning of the terms in it, then it is an *a posteriori* proposition whose truth or falsity can only be known *a posteriori* by empirical evidence, not by reason alone.

The basic contrast between rationalism and empiricism is an argument about the extent and nature of what truths it is logically possible to know *a priori* by the understanding independently of experience, by intellectual intuition and pure logical reasoning alone, and what truths it is logically possible to know *a posteriori* by the senses, by experience and observation alone. The rationalist argues that certain things can be known with certainty to be necessarily true about the nature of reality, what exists, by *a priori* reason alone, even if such truths refer to a reality that lies behind appearances. This the empiricist denies, arguing that claims to knowledge of truths concerning the nature of reality or the actual world must seek their justification, if such justification is possible at all, in experience; *a priori* reason alone cannot reveal the real or actual nature or existence of the world. Reason alone can give knowledge only of what is necessary (that which must be because its denial is contradictory), impossible (that which cannot be because its assertion is contradictory), and possible (that which may or may not be because its denial is not contradictory), but *not what is actual* among what is merely possible or contingent (not impossible and not necessary). If the premises of a valid deductive argument are true, then the

conclusion must be true. A deductively valid argument is one in which to assert the premises and deny the conclusion would be a contradiction. Conclusions can be validly deduced from premises independently of the evidence of experience; but if the conclusions are factual, then such deductions must involve factual premises which can be known to be true not by reason alone but only by the evidence of experience; without the evidence of experience any factual conclusion of a deduction is at best hypothetical and not yet known to be true.

The spectre raised by empiricism is of two exclusive and together exhaustive sets of truths: one set is necessary, certain and known *a priori*, but says nothing about the actual nature of the world; the other set is contingent, not certain and known, if at all, *a posteriori*, but can say something about the actual nature of the world; this undermines the search for necessary and certain knowledge about the actual nature of the world by leaving all truths about the actual nature of the world both contingent and not certain.

Locke

John Locke (1632–1704) was born in Wrington in Somerset and died at Oates in Essex. Locke was far from being the caricature of the philosophical recluse; he was, on the contrary, a man well known in public affairs, sometimes involving considerable danger; but, despite his close involvement with controversial political affairs, Locke was a prudent man. Locke's father was a lawyer and a staunch Puritan and Parliamentarian who fought with the Parliamentarian army in the English Civil War; this began in 1642 against Charles I, who was beheaded in 1649. Locke attended Westminster School, and in 1652 he went to Christ Church, Oxford. At Oxford he studied the arts course of logic, grammar, rhetoric, Greek and moral philosophy. After obtaining his BA he was elected in 1658 to a Senior Studentship at Christ Church which was tenable for life. He taught Greek and moral philosophy, but soon became interested in medicine, and attained the BM (Bachelor of Medicine) degree from the University of Oxford in 1674.

It was during his time at Oxford that Locke became dissatisfied with the philosophy of scholasticism and first became acquainted with, and derived inspiration from, the works of Descartes. Locke was elected a Fellow of the Royal Society in 1668; there he came to know the chemist and physicist Robert Boyle (1627–92), whose emphasis on experimental method and the corpuscular theory of the constitution of matter impressed and decisively affected Locke: it influenced his philosophical thought, particularly in its rejection of Aristotelian modes of physical explanation. Sympathetic to Locke's views is the

motto of the Royal Society, *Nullius in verba*: "Nothing by mere authority". Locke's thought, both in its purely philosophical as well as in its political interests, is consistently marked by the advocacy of tolerance and resistance to dogmatism in the face of the limits and uncertainties of human knowledge. His political thought, as embodied in the *Two treatises on government* (1690), became a philosophical foundation of liberal democracy.

After Cromwell's Commonwealth, the monarchy was restored in 1660 under Charles II. Through his interest in medicine, Locke had initially become in 1667 a medical adviser to Lord Ashley, later the Earl of Shaftesbury. Locke in fact left his college, never to teach there again, and instead entered into a series of official appointments. Between 1675 and 1679, Locke spent time in France mainly for the sake of his poor health. His travels in Europe fostered his keen interest in all aspects of contemporary scientific work. This association and friendship with Shaftesbury was to bring Locke problems; Shaftesbury was party to the failed attempt to overthrow and replace Charles II with Charles's illegitimate offspring, the Protestant Duke of Monmouth. Shaftesbury, fearing impeachment for treason, fled to Holland in 1682, and died the next year; Locke also wisely, because of his support of Shaftesbury and Monmouth, moved to, and for a time hid in, Holland under a false name, until returning to England after the Glorious Revolution of 1688, when the Catholic Stuart King, James II, fled the English throne, to be replaced by the Protestant William of Orange, which led to the Hanoverian Succession. From 1691 Locke lived at Oates in Essex in the house of Sir Francis and Lady Masham until his death in 1704.

It is important to understand the overall aim of Locke's philosophy: it is concerned mainly with determining the nature, scope, and limits of knowledge and with giving an account of the nature of reality. Locke's position stands in contrast to that of many of his philosophical predecessors and, indeed, some of his philosophical successors. The heart of the matter lies in the interplay between scepticism and the scope of human knowledge; and it can be summed up by the aim of discovering what it is human beings are and are not fitted to know. Locke accepts that knowledge, properly speaking, is of truths which are *certain* and *universal*. Our inability to refute scepticism in various areas of human inquiry where we wish to claim to know truths might lead us to the despairing view that only scepticism can remain in those areas. Locke emphasizes the limits of human knowledge proper, but in a way that allows for areas where, although we do not have knowledge in the strict sense, we are not thereby forced into scepticism because in many of these areas of inquiry we are still capable of probable belief; and, indeed, the belief is sometimes so probable that it is virtually as good as knowledge. What Locke is advocating might be called degrees of appropriate certainty. This presents us with

something other than a choice between strict knowledge and total ignorance. In those areas where we cannot strictly speaking know, Locke argues that we should acknowledge that we have reached our limitations; but knowledge in the strict sense is usually not required; the probable belief we may have instead is sufficient for our purposes, and this, although not a refutation, is the answer to the sceptic. Locke advocates the view that absolute certainty in many important areas of human inquiry is not possible for us but nor is it required or even appropriate; an example is our degree of certainty about the existence of an external world.

Locke's strategy in delimiting human knowledge is to examine the power of the human mind and the objects of thought: ideas. The philosophy of Locke stands on two main foundations: first, that all knowledge derives from reasoning about our ideas and, secondly, that all ideas originate in experience. We cannot in our thinking and knowledge go beyond the ideas or concepts we actually have—ideas are the materials of thought and knowledge—and the ideas we have are bounded by what ideas can be attained through experience.

From this it is not surprising to find that Locke opposes what he regards as a prevalent notion that we have innate, or inborn, ideas in the mind independently of experience. It soon becomes clear that what Locke is most concerned to oppose is the existence in the mind of innate principles and knowledge; although in denying the existence of innate ideas—ideas being the building blocks of knowledge—Locke is also denying innate knowledge of truths. One of the chief motives for Locke's denial of innate knowledge is that the identification of a principle as innate or inborn is sometimes used, especially in moral matters, as a block to any questioning of the truth of that principle. But we must, Locke says, think through what we claim to know, and make knowledge our own. This goes along with Locke's general suspicion of authority as a valid ground for accepting something as true.

Apart from certain moral principles alleged to be innate, there were also said by advocates of innate ideas to be innate basic logical principles, such as "Whatever is is". One of the arguments used in favour of innate principles is that there are some principles that are universally assented to as true, and this shows them to be innate rather than acquired. Locke flatly denies that there is such universal assent; children and idiots just do not assent to abstract principles; but he goes on to say that even if universal assent were a fact, this would not show that the universal assent could not be explained in some other way than by saying that what is assented to is innate. In fact Locke thinks the argument from immediate universal assent to the conclusion that particular principles are innate confuses innateness and cases of self-evidence; the universal assent, on encountering a self-evident proposition, is fully accounted for by the relation of the terms in the proposition, meaning we cannot think otherwise if we understand it at

all. Locke rejects the idea that there might be innate principles implicitly in the mind which are not explicitly understood. Moral rules, which are supposedly innate, are not even self-evident and they therefore demand reasons to be given for their acceptance. Moreover, the abstracted ideas or concept terms of abstract principles suggested as innate can be acquired only after experience of the particular cases and the gaining of particular ideas.

Locke does not deny the existence of innate *capacities*—the power to perceive, believe, recognize truth and falsity, judge, assent to principles—but none of these capacities actually amounts in itself to possessing innate ideas, principles or knowledge of truths. If innateness merely amounted to the capacity to recognize and assent to truths when presented, then all knowledge, since it involves this, would be innate—which Locke thinks is absurd.

Locke never questions whether even if there were innate principles this would make any difference to whether those principles were true; he never questions the truth of putative innate principles. The reason for this is Locke's piety; if there were innate principles they would have to be true because they could be implanted directly in us only by God. Locke argues that there are, in fact, no innate ideas and principles, so the question of their truth or falsity does not arise, and the positing of them is unnecessary to explain the knowledge we have. The explanation for all the ideas we have is that they originate in experience: experience is made up of *sensation* derived from external material objects, and *reflection* derived from awareness of the workings of our own mind. Examples of ideas of sense-experience are yellow, elephant, cold, army; examples of ideas of reflective-experience are thinking, believing, willing, doubting.

Locke is not free from the charge of confusing psychological or genetic empiricism with philosophical or logical empiricism. Genetic empiricism is a psychological theory accounting for the way we actually come to have, or acquire, ideas and knowledge of which propositions are true and which false; philosophical empiricism is concerned only with that on which the truth or falsity of propositions depends and what is logically required in order to justify the claim to know whether the propositions are true or false. This makes the distinction between knowledge of truths being psychologically innate and its being logically *a priori*. Showing that a certain proposition is, psychologically speaking, entertained in the mind at a time prior to any experience would not show whether that proposition were true or false or have any relevance to justifying logically a claim to know it to be true or false. Whether a proposition can be known to be true or false logically independently of experience is not shown by discovering whether it was in the mind innately or not, but by deciding of what logical type the proposition is.

Take the following two propositions:

- (a) The internal angles of a plane triangle add up to 180 degrees.
- (b) There are lions in Africa.

If the truth of (a), which is a necessary truth, were questioned, we would prove it to be true by showing it is deducible from the axioms of Euclidean geometry; if (b), which is a contingent truth, were questioned we could only establish its truth by going to Africa and looking. The truth of (a), and knowledge of that truth, is, logically speaking, independent of evidence of experience, whereas the truth of (b), and knowledge of that truth, is, logically speaking, knowable only through the evidence of experience. Whether a truth is knowable *a priori* or *a posteriori* is determined by whether the truth can possibly be established empirically or non-empirically; and this is different from the truth being actually innate or acquired. We might possess no non-empirical truths such as (a) innately; but that would not alter the fact that these propositions are true regardless of any states of affairs in the world, and they can be known to be true independently of experience and by pure logical reasoning. We might possess a whole stack of what turn out to be empirical truths such as (b) innately, and although this might be psychologically surprising it would not alter the fact that the truth of these propositions depends on certain states of affairs in the world obtaining, and they can be known to obtain only through experience, not by pure logical reasoning alone. A truth such as "Either it is raining or it is not raining" ("*p* or not-*p*") is an *a priori* truth because it is true independently of any states of affairs in the world, and it logically can be known to be true independently of inspecting the weather; but it tells us nothing about the weather; it does not help us to decide if we should take an umbrella. All propositional beliefs, even if true, which are not logically *a priori* can be known to be true only by checking them against the evidence of experience, regardless of whether we have the beliefs innately or not. Those truths known independently of experience are said to be necessary in that their denial implies a contradiction; those truths known only by experience are said to be contingent, as their denial does not imply a contradiction. The philosophical concern should be to distinguish between *a priori* propositions, which are all those propositions where the logical justification of knowledge of whether they are true or false is independent of empirical evidence, and *a posteriori* propositions, which are all those propositions where the logical justification of knowledge of whether they are true or false is dependent on empirical evidence.

There is considerable uncertainty and controversy over what Locke means by "idea". Locke defines an idea as "whatsoever is the object of the understanding when a man thinks". Some have taken Locke to mean by "idea" some kind of mental entity—mental images which are objects in the mind. The consequence of this (a point raised by

Berkeley) is that it immediately leads to scepticism about knowledge through perception of the external world. If the "veil of perception" or "picture-original" view is correct, and we only ever perceive ideas in the mind, then there can be no way of checking if the ideas represent the external world truthfully, or even if there is an external world at all corresponding to the ideas. We are locked in a circle of ideas, with the knower logically blocked off from what is known; our ideas are a barrier between us and what the ideas are ideas of. Partly because of this point, which seems too obvious for Locke to have missed, and which he even seems to point out, other interpreters of his work suggest an alternative view in which the reification of ideas is resisted. Locke, it is said, means by "idea" in "idea of X" a mental or perceptual *act*, not a thing; "idea" refers to our understanding of X, or our perception of X, as distinct from X itself; "idea of X" means "X-as-it-is-perceived/understood/known/appears"; and it expresses the epistemological relation between the knower and the thing known. To avoid a regress, what must ultimately be caused in the perceptual process is an act of perceptual awareness itself, not another object of which to be aware. An "idea of X" involves two entities, knower and object known, not three by including an entity "idea of X". The expression "idea of" points out that our conception or perception of an object is *our* conception or perception; it is how it appears to us, as opposed to how the object is in itself, which may differ from our idea. This emphasizes the assertion that we inevitably view things under the constraint or qualification of their being seen from our point of view—how things appear to us—and that we cannot attain the God's-eye view of knowing objects as they are in themselves quite independently of all reference to its being our perspective. To say I have an idea of X is just to say I have some understanding of the object X. On this interpretation, when Locke speaks in a variety of ways about a relation of resemblance or non-resemblance between ideas and what they are ideas of, he is not committing himself to this being like the relation between a picture or image and an original—literal picturing—but rather the kind of relation that holds between an accurate and inaccurate description and the object described.

Locke divides ideas into *simple* and *complex*. Complex ideas are compounds of simple ideas. We may experience ideas in complexes, or even only in complexes, but they must be reducible to simple atomic unanalyzable ideas. The thinking behind this is that at some point there are ideas which cannot be broken down into anything simpler and to have the ideas at all one must derive them directly from experience. If one has never experienced the simple idea of red, there is no way that having the idea can be explained by showing how it is compounded of simpler ideas one has experienced; whereas the idea of a mermaid, even if one has not encountered mermaids in one's experience, is made up of ideas one has encountered in experience.

Locke is not saying that we always experience simple ideas first, and then build up compounds, merely that all compounds must be analyzable into simple ideas of which we have had direct experience. Locke's position places restrictions on the scope of imagination: whatever we make up we will only ever be compounding simple ideas that ultimately originate in experience.

For Locke the meaning of a word derives from its standing for, and its association with, an idea or complex of ideas; we know the meaning of a word when we know the idea it stands for. If someone has not experienced the simple idea X, then he will not understand the meaning of the word standing for X. We will, in attempting to speak about that which is, strictly speaking, beyond our experience and is in no way analogous to anything in our experience, be using meaningless expressions and talking nonsense because we will be unable to specify any idea for which the word stands.

If it is the case that we only ever encounter particulars in our experience from whence we derive particular ideas, the problem arises as to how we come by abstract general ideas, for which general words stand as signs—such as “redness”, “man”, “nurse”—which can apply equally to many particulars. Such general terms are necessary for communication and knowledge. Pure nominalism holds that all that any group of particulars under a general name have literally in common is the sharing of that name; but this leaves unanswered the problem of universals: namely how we know which particulars come under that general name in the first place. Locke has more than one answer. His first answer is that we are blessed with a faculty of abstraction: by a process of omission the abstract general idea is formed by leaving out of each idea of particular members of a similar class all those characteristics in which they differ, thereby including only that which is common. The general idea will itself be a particular; but it is not clear what the resultant idea amounts to. Berkeley argues that Locke's procedure is impossible: if we take away all particular features we are left with an impossible idea; we could not represent to ourselves a red which is no particular shade of red at all; there cannot be an idea which is merely determinable. Locke's second answer is that the meaning of abstract general ideas and words is fixed by “nominal essences”: we notice similar characteristics between particulars, and we decide on some set of defining objective particular characteristics by which we then have the ability to recognize whether any particular is correctly admitted to a specific general class.

Locke explains the relation between our ideas in the mind of sensible qualities of external objects and those sensible qualities as they exist in external objects themselves by making a distinction between primary qualities and secondary qualities,

- (a) Primary qualities: our ideas of primary qualities resemble those

qualities as they are in bodies. Primary qualities are size, extension, shape, movement, solidity.

- (b) Secondary qualities: our ideas of secondary qualities do not resemble those qualities as they are in bodies. Secondary qualities are hot, cold, sound, colour, taste, odour, etc.

Locke was greatly influenced by the atomic theory of matter propounded by Boyle; the basic stuff of the natural world consists of material objects which are made up of an insensible structure or configuration of atoms or corpuscles which themselves have no internal structure; these microscopic atoms have only primary qualities. Locke thinks, however, that the soul is immaterial, although he does not think it impossible that God could have made thought an attribute of matter. Macroscopic material objects we perceive appear to have both primary and secondary qualities, but both qualities at the macroscopic level depend on configurations of insensible particles which themselves have only primary qualities. The secondary qualities we perceive are not in objects *as-we-perceive-secondary-qualities* to be; this does not mean the secondary qualities are *nothing* in objects; rather, the secondary qualities are *in objects* some *determinate* fine corpuscular structure; our ideas of secondary qualities are a result of the power of qualities as they exist in objects, as insensible corpuscles, which produce certain sensations in us. The ideas of secondary qualities are an effect on us of those qualities in objects as insensible corpuscles with only primary qualities. The ideas caused in us of secondary qualities never resemble that which in objects causes us to have those ideas, but are in objects nothing but a certain configuration of corpuscles.

Take, for example, the secondary quality red: it is true to say that object *X* is red if what is meant is that *X* has a corpuscular structure such that under normal conditions it has the power to produce in us the idea or sensation of red, and thus the object *X* is seen as red; but it is false to say that object *X* is red if what is meant is that red exists in *X* in the same way as I have the idea or sensation of red. Locke also distinguishes a third quality which he simply calls "powers", which is the capacity of bodies to cause changes in other bodies such that they then appear different to us, as when the sun melts wax.

Another way of explaining the distinction between primary and secondary qualities is through the notion of resemblance and accurate descriptions. Our ideas of primary qualities can resemble (can be accurate or correct representations/descriptions of) those qualities as they are in objects. Our ideas of secondary qualities never resemble (cannot be accurate or correct representations/descriptions of) those qualities as they are in objects. This is not to say we cannot be mistaken about what determinate primary quality an object has; but we *can* be right in the sense that the quality exists in the object as the same kind

as that which is perceived. We might misperceive the determinate shape of *X* as triangular when it is square, but we are not mistaken that it really has some determinable shape or other; in this sense our ideas of primary qualities resemble the qualities as they are in objects. We will always be wrong about the object having any secondary qualities if we mean that the secondary qualities ever exist in the object in the same way as we perceive qualities; secondary qualities do not exist in bodies in the same way as we perceive them at all. This does not mean we are incorrect to describe *X* as red if we mean by this that it has that determinate corpuscular structure which causes one to have the idea of red under specific conditions.

God has chosen to connect specific corpuscular configurations in bodies with the power to produce the specific sensations or ideas we experience; why a certain corpuscular configuration should produce just those experiences within us is something Locke regards as mysterious.

Recent thinking suggests that Locke was not *making* the distinction between primary and secondary qualities, but was *accepting* the distinction, which he took over from the scientific work of Boyle. Berkeley objects to Locke's apparent argument for the distinction that the primary qualities are invariant and secondary qualities variant with respect to observers: primary qualities are just as variant with the changing perspective of the observer as secondary ones. But if Locke did not try by argument to justify making a distinction between primary and secondary qualities, then Berkeley's counter argument is beside the point. Locke's chief point in accepting the corpuscular hypothesis is that it provides an economical unifying explanation of a great variety of phenomena; and whereas we can conceive of an explanation of changes in secondary qualities in terms of changes in primary qualities, the reverse seems inconceivable.

How is Locke entitled to have an idea of, and talk meaningfully about, the insensible configuration of particles which are too small for us to experience them, given his empiricism about the origin of all ideas? Locke's answer is that our inability to experience such particles is purely contingent, and did we but have microscopical eyes, we would see them. Moreover, corpuscular explanations involve insensible particles which are entities which have properties of the same kind as, or are analogous to, the properties of macroscopic things we do experience, namely, primary qualities. We speak intelligibly in referring to the particles because we have ideas of the kind of properties they have and therefore understand what we mean by the words describing them.

Locke's account of substance, the most fundamental independent stuff in the world, is subject to different interpretations. On one view Locke notoriously means by substance "naked substance", a something I know not what: a "something", or *substratum* in general,

beside all the qualities we predicate of objects which "support" all those qualities. We have ideas of things having various qualities, and since we suppose that these qualities cannot subsist by themselves, we suppose there to be a something which they are the qualities of, and that that something is something beside the qualities themselves. But if a *substratum* is imagined to be that which is stripped of *all* qualities, one is left not with a special, if mysterious, something, but with an ineffable nothing. Thus the reason that this substance is not known is that a propertyless substance is logically or necessarily unknowable.

Other interpretations have suggested that Locke's remarks concerning pure substance in general—*substratum*—are ironic. The suggestion is that Locke rejects the confused notion of a pure substance in general and aims to replace such talk with positive talk of something else, while also wishing to explain how we are led to think of it as underlying aggregates of sensible qualities. He thinks we are led to belief in substance through: (a) the grammar of subject-predicate talk; (b) seeking something to explain the cause of the union of apparently unrelated aggregates of different sorts of qualities; (c) our notion that qualities—for example, the yellow, malleable, heavy qualities of gold—cannot exist separately from something in which the qualities can exist. Locke's reinterpretation of substance originates in substance as the sought-after cause explaining why some particular substance such as gold should always have the qualities of being yellow, malleable, and heavy, when there seems to be no connection between the qualities. The explanation for the connection or union of these apparently unconnected qualities in all instances of a particular kind of substance in fact lies in the common real determinate internal corpuscular structure.

Locke describes the nominal essence of a thing as simply the qualities or properties we decide to gather under a sortal name, such as "gold", for the purpose of classifying particulars into kinds. The nominal essence gives us a criterion for identification. Although there are natural constraints on us, the sorting of things into kinds in this way is created and linguistic.

Locke talks of real essence in two senses. First, the traditional scholastic sense of real essence as a thing's substantial form which makes a thing the kind of thing it is; Locke rejects this as obscure and having no explanatory use; to explain the properties of gold by saying that it has those properties because it possesses the substantial form of gold is just to say gold has the properties of gold; talk of substantial forms stops us seeking the underlying causes. Talk of underlying causes refers us to Locke's second sense of real essence; that is, Lockean real essence which is the real determinate internal corpuscular constitution on which the apparent properties depend.

We cannot strictly know the inner atomic structure of things because our senses are not fitted to perceive them; nevertheless, the notion,

unlike substantial forms, is an intelligible hypothesis which has genuine explanatory power. Moreover, our lack of knowledge of the inner atomic constitution of things is, unlike the lack of knowledge of "pure substance in general", merely a contingent matter.

Locke defines knowledge as "nothing but the perception of the connection and agreement, or disagreement and repugnancy, of any of our ideas". Propositions are true when the ideas constituting the propositions are connected in such a way as to make them true; we can know propositions to be true in so far as we can "perceive" this connection. Add to this the condition that knowledge must be of truths that are certain and universal, and what we can be said strictly to know turns out to be extremely meagre. But we are not left only with doubt where we cannot have knowledge since we can also have probable belief. Locke's overall aim is to commend to us the view that the lover of truth should not hold a proposition more firmly than the proof or evidence for it warrants. Locke lists four sorts of agreement and disagreement of ideas.

- (1) *Identity or diversity*
Here he seems to have in mind logical identity and contradiction.
- (2) *Relation*
Here he is referring to demonstrative logical or mathematical relations.
- (3) *Coexistence or necessary connection*
Here is meant connection of ideas which reflect the manner of connection of properties of things occurring together in nature.
- (4) *Real existence*
Here he means what really exists in the world.

Our limited ability actually to perceive the appropriate connection between ideas in a large range of cases immediately restricts what we can know, strictly speaking. There is no problem in claiming to know as true propositions whose ideas can be immediately perceived as connected or disagreeing, such as "blue is blue" or "blue is not yellow"; these are intuitive truths. Such truths Locke refers to as trifling. Locke more dubiously claims some moral truths can be known intuitively. There is also little difficulty in making a plausible case for our knowing truths which result from logical deductive reasoning, such as geometric and mathematical truths, which can be thought of as made up of intuitive steps or connected chains of intuitive truths which form the process of demonstrative reasoning. After this difficulties arise.

Locke himself admits that to have an idea is one thing, but it does not follow, when not actually receiving the idea, that anything exists corresponding to that idea. The problem is the lack of any connection to be perceived between our having an idea and the real existence of that which the idea is an idea of. A possible exception is the existence

of God and that the idea of God entails that God is—which amounts to a compressed ontological argument. Locke equivocates on what we can be said to *know* exists. He thinks that we have intuitive knowledge of our own existence; he thinks that we can have demonstrative knowledge of God's existence; and he thinks that, while we are actually perceiving objects, we have a belief of such great assurance and certainty that those objects exist without us that it "deserves the name knowledge". He is clear, however, that strictly speaking we cannot know the truths expressing actual factual connections between the properties we experience objects to have or know the scientific hypotheses with which we describe their behaviour (for example the connection of the idea of "gold" and "soluble in *aqua regia*" in the proposition "Gold is soluble in *aqua regia*"); we cannot know truths in these cases because we cannot perceive any intrinsic connection between the constituent ideas reflecting those properties such that it would make them true; we cannot perceive any necessary connection between the ideas; all that we perceive is the juxtaposition or conjunction of the ideas. So in the case of natural science we are not capable of knowledge, but we can believe with some degree of probability in the truth of scientific propositions, and the probability of truth will increase in proportion as it conforms to my past experience and that of others.

Locke's view suggests a hierarchy of certainty, here given in descending order of certainty:

- (A) intuition
- (B) deductions or demonstrations
- (C) sensitive knowledge
- (D) natural science.

(A) and (B) strictly constitute areas of knowledge; (C) is knowledge of the existence of particular objects in the external world as we actually perceive them, although it is not so certain as (A) and (B); but with (D) we have only probable belief. Knowledge of our own existence is included in (A), and that of the existence of God in (B). With these exceptions, Locke is in danger of leaving us with knowledge almost entirely of propositions which are hypothetical non-existential (stating what follows if we accept certain propositions, regardless of whether those initial propositions are actually true) and verifiable *a priori*, and little knowledge of propositions which are categorical existential (asserting the actual existence and nature of things) and verifiable *a posteriori*. There is certainly a problem in claiming to know the general or universal existential propositions and the existence of objects not actually perceived which are required for natural science. In short, knowledge is restricted to necessary certain truths, in which case knowledge is limited to logical relations and excludes relations of fact which are neither necessarily nor certainly true.

Locke is Cartesian, or at least rationalist, in giving a necessitarian account of reality: knowledge of reality would ideally be one of revealing the natural necessity and connection of things. He differs from the rationalists in his scepticism over whether natural necessities can actually be known; but he also differs from empiricists in holding that there nevertheless are natural necessities—necessities between matters of fact about the world—which could be known. Thus he does not fit the traditional empiricist mould for two important reasons:

- (a) Locke does not share the empiricist view that all knowledge which we can know independently of experience by reason alone is thereby trivial and unable to tell us anything about the actual nature of reality. Mathematical and geometrical truths are cases of non-trivial *a priori* knowledge in which we discover new truths.
- (b) Locke believes, unlike Hume, in natural or metaphysical necessity. The epistemological problem that we cannot know natural connections to be necessary and with certainty does not show the necessary connections are not there. Locke says in addition that our inability to perceive the connections as necessary is a purely contingent matter which depends merely on our inability to perceive the inner microscopic corpuscular structure of material objects; could we see this structure, we would perceive that the connection between the qualities objects have is necessary. If we could see the microscopic structure, we would see that the sensible qualities or properties of *X* which depend on that microscopic structure must occur together necessarily.

Locke does not see the problem Hume uncovers, that no matter how acute our senses we would only ever perceive one idea *A* in conjunction with, or followed by, another idea *B*, but would never perceive between them a necessary connection such that *B* must be in conjunction with, or must follow, *A*, and things cannot be otherwise. If the connection were necessary, then the assertion of (*A* and not-*B*) would be a logical contradiction, but it never is when describing actual matters of fact. There is no analogous connection between natural matters of fact for necessary deductive connections or logical relations. It is never a logical contradiction to suppose that *A* occurs, but *B* does not follow, or that property *A* is not found with property *B*, no matter how many times the conjunction of *A* and *B* has been observed. Necessity based on logical contradiction is the only sort possible. The universal generalization "All *A* is *B*" and the necessary causal connection "If *A* occurs, then *B must occur*", where *A* and *B* describe matters of fact, cannot be known to hold, or the beliefs rationally justified, through the evidence of experience or by deductive reasoning; thus they cannot be known or rationally justified at all; this is the logical problem of induction and causation.

Berkeley

George Berkeley (1685–1753) was born near Kilkenny, Ireland. At the age of fifteen he entered Trinity College, Dublin, and graduated with his BA in 1704 at the age of nineteen; he became a fellow of the College in 1707. The spur to his philosophical writing probably derived from reading Locke, Newton (1642–1727), and Malebranche (1638–1715). Berkeley's *New theory of vision* appeared in 1709, with a fourth edition in 1732. His major philosophical works, *A treatise concerning the principles of human knowledge* (1710) and the *Three dialogues between Hylas and Philonous* (1713), were both published by the time he was twenty-eight. In 1724 he resigned from his fellowship to become Dean of Derry. In 1728 Berkeley left, with his wife, for America in an attempt to found a college in Bermuda to educate the native Indians and the sons of local planters, but the money for the project failed to materialize from the government in England. Thus in 1731 Berkeley returned to England, and eventually to Ireland where he became Bishop of Cloyne in 1734. In 1752 he moved to Oxford, and died there suddenly in 1753 at the age of sixty-eight.

It is perhaps more than usually necessary in understanding the philosophy of Berkeley to place it in its intellectual context; otherwise Berkeley's philosophy can seem too obviously false to require serious examination; his philosophy has been called immaterialism or idealism, although the two terms are not exactly equivalent.

Berkeley exemplifies one way of stringently applying empiricism: he conjoins the view that all we can ever know is our immediate ideas with the view that words and other expressions in our language derive their meaning only from association with specific ideas; this leads to the ontological doctrine that only ideas subsisting in minds and minds themselves can be said to exist because to talk of things existing in any other way is meaningless as the expressions used in the talk are necessarily unconnected to any ideas. Expressions not translatable into, or associated with, some experience are meaningless.

The essential background to the understanding of Berkeley's philosophy is formed by a combination of the new scientific materialism and the representative theory of perception. Scientific materialism, mainly derived from Newton, proposes a mechanistic conception of the universe which functions like the works of a giant clock and a corpuscular hypothesis as to the constitution of matter. The representative theory of perception, mainly derived from an interpretation of Locke, is here the thesis that the immediate objects of perception are always ideas. There are also connected problems arising from Descartes and Malebranche concerning the relation between the incorporeal mind and the corporeal body. Berkeley saw the scepticism that could arise from these beliefs as a scandalous affront to common sense and a threat to religious belief; but all the forms of scepticism,

Berkeley thinks, can be eliminated at one blow by rejecting their common assumptions.

The scepticism to which the materialistic philosophy gave rise took three main forms:

- (a) the existence of sensible things
- (b) the nature of sensible things
- (c) the existence and nature of God.

The main additional sceptical problem posed by Cartesianism is:

- (d) how matter and spirit can interact.

Materialism gives rise to all the first three forms of scepticism when combined with the doctrine that we only ever perceive immediately ideas in our minds by opening an unbridgeable gap between how things appear to us and how they really are in themselves: a gap between our ideas and what our ideas are ideas of. Material objects, specifically their corpuscular structures, are seen as the cause of our ideas; but material objects do not have, in the same way that we perceive them, all the qualities that they appear to have. The gap between the ideas that we immediately perceive and their supposed causes, which we do not directly but only ever mediately perceive by way of ideas, opens up the possibility of an insoluble scepticism concerning our knowledge of the nature and even existence of the objects of the external world. We can never gain immediate access to the something, whatever it is, that is the cause of our ideas to check whether the ideas which supposedly represent the nature of that something are accurate, or even whether the supposed something exists at all; we can never perceive the something that is the supposed cause of our ideas immediately but only mediately in virtue of perceiving immediately intermediate mental objects: ideas. Materialism also leads to atheism according to Berkeley, since the posited material substance is to a high degree, or perhaps completely, independent of God in its operations and existence. Many materialists supposed that God was ultimately still required as the creator and first mover of the universe; but if we suppose that the universe has existed for ever, then God's existence again becomes dispensable. The existence of God is still possible, but His existence is not logically required, nor even obviously important.

An additional, but connected, source of scepticism derives from Descartes and Malebranche. In the Cartesian view there are two distinct substances, mind and matter, whose essential attributes are thought and extension respectively. The problem then arises as to how their interaction is to be made intelligible: how can the non-extended mind cause changes in motion of extended bodily parts, such as the brain, and how can motions of the extended bodily parts cause changes in non-spatial mental substance which produces thoughts? This problem led Malebranche to the doctrine of occasionalism: this

holds that although mind and body do not interact, God on the appropriate occasions systematically intervenes to produce the same result as if they did interact; on the occasion of my willing the movement of my body God causes the correct bodily movement; on the occasion of my observing a physical object God causes me to have the appropriate perception by sharing in His ideas.

Berkeley thinks that materialism is:

- (i) *Unjustified*
The arguments presented for the adoption of materialism are insufficient,
- (ii) *Unnecessary*
The thesis is extravagant since it posits the existence of material entities that are not required to give an explanation of the course of our experiences,
- (iii) *False and must be false*
Matter is not, and indeed cannot be, the cause of our experiences,
- (iv) *Meaningless*
It requires us to give meaning to the term "matter" or "material substance" which is something we never directly experience, which is the cause of our ideas; but as the meaning of a term is the idea for which it stands, and there can be no idea of that which we cannot experience, then all terms referring to entities such as material substance, which are beyond experience, must be meaningless,
- (v) *Contradictory*
It requires that ideas may exist when not perceived by us in an unthinking corporeal substance or matter.

In several important ways Berkeley is a very strict empiricist. Generally he holds that the limits of what it is intelligible or meaningful to talk about must refer to something in the content of our experience. If we are making some distinction in the world, it must, to be genuine, refer to some perceivable difference; if a proposition is intelligible, it must refer to something perceivable. It is surely part of the persuasiveness, even attractiveness, of Berkeley's idealism that it asks us to concentrate only on the actual character of the content of our own minds.

Berkeley's overall strategy in opposing all the forms ((a), (b), (c), (d), above) of scepticism derives from closing the gap between our ideas and what our ideas are ideas of; thus preventing the sceptic from driving a wedge between the two. Berkeley advocates negatively immaterialism and positively idealism; he also assumes that if materialism can be shown to be false, then his form of idealism must be true in virtue of its being the only alternative to that materialism.

Talk of material objects, in Berkeley's philosophy, is not a reference to some material substance which can exist unperceived as the supposed cause of our ideas but which, since the objects of perception are always

ideas, we never actually perceive. To talk of material or sensible objects is to talk about actual or possible objects of perception, and that is to talk of ideas or bundles/collections of ideas themselves which must, as ideas, exist in a mind or spiritual substance. To talk of material objects or sensible things is not to refer to something other than the ideas we perceive, it is to talk of those ideas themselves; what we mean by material objects is just certain ideas or sets of ideas. Any reference to the nature or character of the world is a reference to, and is only intelligible as a reference to, actual or possible experiences. What we immediately perceive in vision is a flat, two-dimensional array of colours and shapes. In the *New theory of vision* Berkeley presents arguments to show that distance is not something immediately perceived but something constructed from certain orderly relations of the ideas of different senses in the mind. Thus to say an object is one mile away is just to say that a certain sequence of ideas—for example, those constituting the experience of walking forward—would have to go through the mind before we received such-and-such ideas of touch. This lays the groundwork for the view that what is perceived (the object of perception), because it is in no case an immediate perception of something at a distance from us, is therefore always something in the mind.

The equating of ideas with sensible things, which thereby makes sensible things mind-dependent, eliminates each of the previously mentioned forms of scepticism ((a), (b), (c), (d), above) produced by materialism and Cartesianism in the following way.

- (a) The existence of sensible things. This problem is eliminated because the sceptic cannot drive a wedge between ideas and things; if the objects of sense *are* ideas, and we cannot doubt that we have ideas and thus ideas exist, we cannot doubt the existence of the objects of sense or sensible things.
- (b) The nature of sensible things. This is just the sum of a thing's sensible qualities. In addition science no longer purports to reveal the essential nature of things in the external world whereby it can establish the necessary connections required for true causal relations between the sensible properties of things we can perceive; rather, it aspires only to map the regular correlations between ideas, that is, between phenomena.
- (c) The existence and nature of God. This problem is eliminated by making God metaphysically indispensable: once material substance is eliminated, it is necessary to affirm that God exists as the immediate real cause of those ideas that are not caused by our imaginations and as the sustainer of those ideas we do not actually perceive; thus God's existence is manifest at all times as the immediate cause of the vast majority of that which we experience; the supposition that God does not exist is refuted by almost every experience we have.

- (d) How matter and spirit can interact. This problem is eliminated by denying the existence of material substance; then the problem of interaction between spirit and matter simply does not arise. Berkeley also rejects occasionalism, arguing that we cause those ideas which constitute what we can legitimately will, such as moving our legs.

Berkeley presents various arguments opposing materialism.

- (1) Berkeley thinks that the conception of matter as really having only primary qualities, such as extension, shape, solidity, movement, is an impossible one; he questions whether it is possible for us to conceive of a shape which is no colour whatsoever; the conception of matter required for materialism is impossible, for it involves matter devoid of all secondary qualities, which are types of qualities which it could not lack, and from which primary qualities cannot be separated.
- (2) Berkeley argues that it is a logical contradiction to talk of conceiving of a thing which exists unconceived, for to conceive of the possibility of something existing unconceived is necessarily to conceive of that thing. But this argument, although tempting, is fallacious. It is true that it is not possible for *A* to be conceived of, and at the same time both exist and be a thing unconceived; but that does not mean that at some other time *A* could not exist as an unconceived-of-*A*; thus there is nothing contradictory in *A* existing unthought about.
- (3) Berkeley turns Locke's argument concerning the relativity of perceptions against Locke's materialism. Berkeley takes Locke to be arguing for the distinction between primary qualities (shape, size, motion, solidity) and secondary qualities (colour, taste, heat, sound, etc.) on the basis that those qualities, not really in objects as we perceive them to be, are those that vary with the disposition of the perceiver; such qualities are, as they are perceived, subjective or in the mind (Locke does not in fact argue that secondary qualities are therefore *merely* subjective) and result from the effect of the insensible particles on us. But Berkeley points out that if this argument proves that secondary qualities are ideas in the mind, the same argument proves that primary qualities are also only ideas in the mind, for these too vary with the observer. In fact, there is no reason to suppose that in either case we have shown the qualities to be subjective, for there is no reason to believe that for a kind of quality to be really in objects, or be attributed as a real objective property of objects, it must be invariant with all changes in the observer. Moreover, we would actually expect the real properties of things to vary with the observer; for example, size as we get closer to an object.
- (4) This argument concerns pain and heat. When we approach a fire

closely the heat is felt as a pain in the mind; when we are at a further distance from the fire the heat is felt merely as warmth. We are not tempted to say that the heat felt as pain is in the fire; so we should also say the same for the lesser degrees of heat felt as warmth, that heat is an idea in the mind.

- (5) In this Berkeley runs together the notion of matter with what Locke has to say about substance in general. He attributes to Locke an account of substance which he thinks unintelligible, and then takes this to be Locke's account of material substance or matter, so that is also unintelligible. Locke's discussion of substance in general seems to suggest that it is characterized by being the "support" of all qualities; the qualities cannot subsist alone, so substance is that in which the qualities subsist. But if substance is the support of *all* qualities whatsoever, then any attempt to give it a positive characterization is impossible, since to do so would be to attribute qualities to it; thus substance becomes an unknowable qualityless "something". While this argument is perfectly flawless as an attack on a qualityless *substratum*, it is wide of the mark as an attack on matter because no materialist would suggest that matter is qualityless.

The general form of Berkeley's positive argument for idealism is as follows. Sensible things (ordinary objects) are those things perceived by the senses, and those things perceived by the senses are ideas. It follows that sensible things are ideas or collections of ideas. In addition, ideas can exist only if perceived by minds. With this additional premise it follows that sensible things cannot exist unperceived.

Repeatedly Berkeley asks how the supposed "material substance" should be characterized: what qualities or properties does it have? Indeed any concept, apart from that of mind, if it is to be given a meaning at all, must be translated into talk about some possible or actual experiences. Whatever is suggested as the nature of "material substance", he points out that, if we can make what we are talking of intelligible at all, the quality referred to is something that we experience; but what we experience immediately is ideas, and hence the existence of the quality is as an idea in the mind; and if we refer to something that we do not experience, then he does not understand what we mean when we refer to it.

Berkeley makes a distinction between immediate and mediate perception; respectively between the immediate sensations of the various senses, which involve no inference and about which we cannot be mistaken, and that which is suggested by these perceptions. The proper objects of perception are strictly speaking only those things we perceive immediately, and all else that we claim to perceive is a construct or inference from immediate perceptions.

Thus Berkeley identifies the normal everyday objects or sensible

things that we talk about with ideas or bundles of ideas; but in making things into ideas he thinks he can show that he has not made them any less real. Berkeley's idealism is opposed only to the philosopher's conception of material substance as that in which sensible qualities that we perceive through the mediation of ideas subsist when we do not perceive them. Berkeley concludes that the very meaning of saying that sensible objects exist is that they are perceived—although at times he suggests that an object's existence consists in its being perceivable. Berkeley moves from the commonsense belief that sensible things are simply what we perceive, to idealism which holds that the existence or being of sensible things consists in their being perceived or at least perceivable. In the end Berkeley holds to the view that to be or exist as a sensible object is to be actually perceived, and not to the phenomenalist view that to be is to be perceived or *perceivable*—to be perceivable is to exist as a mere permanent possibility of sensation. Thus, in Berkeley, with respect to sensible things, *esse est percipi*: to be is to be perceived. This is not the only meaning that can be given to existence, however: minds or spiritual substance, which have ideas, also exist. To exist is thus also to perceive: *esse est percipere*: to be is to perceive or be a perceiver. So in full we can say *esse est aut percipi aut percipere*: to be (exist) is either to be perceived or to perceive. Spirits are not, like sensible things, constructed as phenomena out of perceived collections of ideas; they are that substance in which ideas inhere.

This position might seem to suggest implausibly that when sensible things are not perceived by us they cease to exist: that they would come and go out of existence. This would be true if only our own or only human minds did the perceiving. But Berkeley's view is only that to exist is to be perceived by some mind or other. This is part of God's place in Berkeley's world, although strictly speaking God does not perceive ideas since He lacks senses, He nevertheless sustains in existence by His mind those ideas of sensible objects not actually perceived by us. Ideas that do not subsist in our finite minds subsist in the infinite, omnipresent, omnipotent mind of God. God is essential to Berkeley's system; and if the system is true God is indispensable to all of us. God is required for two main reasons. First, God is required to give the continuity of a sustained existence to sensible things unperceived by us. Second, God is required as the cause of those ideas we experience which are not caused by us. The only entities capable of being real efficient causes are minds, which alone are active as they are capable of willing; ideas themselves are inert and incapable of being real efficient causes. Berkeley agrees with Locke that causality can only be understood through the experience of willing, but goes further in saying that the only intelligible cases of causation are those that involve willing. We are to a limited extent capable of creating ideas through the faculty of imagination, but most of the ideas we have are not caused by us; they must therefore be caused by some other mind;

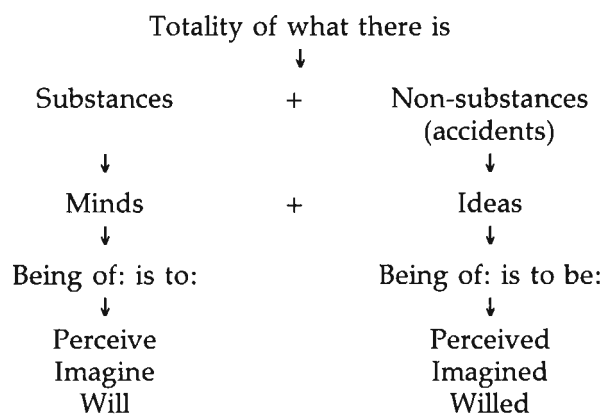
nothing but the infinite mind of God could account for the richness, stability and orderliness of the ideas we perceive. God *directly* causes us, without the unnecessary mediation of any material substance, to have those ideas which we call ideas or perceptions of sensible things, which are those ideas not caused by ourselves.

Berkeley maintains the distinction between perception of reality and the imagination, and denies the suggestion that he has turned the world into mere fancy. Initially the distinction is made by pointing to those ideas that come before our mind that are not products of our will and imagination; these ideas are ideas of reality and have some other cause, and that cause is God. In short, the real is characterized by being those ideas caused by God. However, dreams also are involuntary although caused by us. Also the problem remains of how we identify which ideas are God-caused. There is, argues Berkeley, a greater strength (force and vivacity), order and coherence among ideas we refer to as being of reality.

There remains too the problem of distinguishing veridical perceptions from illusions. A stick appearing bent in water is a genuine perception, since it is not caused by us; it is an illusion, not in isolation, but in virtue of its relation to the sequence of other ideas we have, such as whether it is followed or not followed by the experience of a straight stick if we feel the stick in the water or the sight of a straight stick if we take it out of the water.

Berkeley seems to say there is an "archetype" (original) idea in the mind of God which God wills us to perceive. We perceive ideas as well as imagining ideas. God imagines and wills ideas only; if this were not the case, we would have to posit an infinity of Gods as the cause of each other's perceptions. God wills that we perceive "ectypes" (copies) of aspects of the archetype ideas in His mind. The notion of two or more people perceiving the same thing, although their ideas may be qualitatively different, seems to depend on there being a common archetype.

We can summarize Berkeley's ontology in the following way:



Reference here to "Minds", of course, includes the mind of God.

Berkeley's idealism claims not to question the truth of the judgements of common sense; rather it claims to affirm them and to make clear what affirming those truths really means. Berkeley's world will *appear* exactly the same as the world containing matter; it makes no difference to the course or order of our experiences. Nevertheless Berkeley's world *is* different even if it looks the same.

This brings us to Berkeley's views on the meaning of words or terms. The meaning of terms is the ideas for which they stand; if there is no identifiable idea corresponding to, or associated with, a term, then it is meaningless; if the term has a meaning at all, it must refer to some feature of experience: to a particular idea or collection of ideas.

This leads us to examine Berkeley's objection to abstract ideas as the meaning of general terms. Locke had suggested, according to Berkeley, that it was possible to form abstract ideas from particular ideas and that this explained the meaning of general terms and their ability to apply to any particular of a class of particulars similar in some respect; thus we form the abstract idea of triangularity, which is what the term "triangularity" stands for, and so it applies indifferently to every triangle. A general term such as "man" applies to all things of the same kind, namely men. The abstract idea applies indifferently to all particulars of a certain class by virtue of including only that which all the particulars have in common and nothing in which they differ. Berkeley thinks that Locke's notion of our forming abstract ideas is both impossible and unnecessary. It is impossible because the process of abstraction involves separating qualities that cannot be separated, and running together qualities that are incompatible. In the case of triangularity we have to separate off just the property of being a triangle from that triangle being, for example, any particular or determinate size or colour; it is also an idea of a triangle which is no particular kind of triangle, so it must, to be general, be an idea which is at once all and none of the different kinds of triangle. Berkeley thinks that we cannot form such an idea. Abstract ideas are unnecessary because terms can be general without their meaning deriving from their standing for abstract ideas: terms become general through their being *used* to stand for a class of particulars which are similar in some relevant respect.

The connection of this with Berkeley's objection to materialism is that he sees the route to positing material substance as dependent on the possibility of abstraction. If we can form abstract ideas, it is possible to argue that we can speak meaningfully, through the formation of an appropriate abstract idea, about something that exists which is not, and could not be, an actual object or content of experience; we can thereby give meaning to terms such as "matter" or "material substance" and so refer to something other than what we can

actually experience—which is particular ideas—and then posit its existence independently of its being perceived. If Berkeley has shown that abstract ideas are impossible, and if abstract ideas are required to give meaning to terms such as “matter” or “material substance” which refer to that which can exist unperceived, then he has shown that all talk of matter or material substance in this sense is meaningless or unintelligible.

Berkeley is, however, strangely inconsistent in his empiricism, since he sees fit to talk, and claims to talk meaningfully, about mental substance and God, of both of which we can never actually have ideas, so talk of them should strictly be meaningless. Ideas can only be like other ideas; ideas are passive or inert whereas minds are active; ideas are thereby debarred from representing spiritual substance. Berkeley tries to get round this by claiming that although we cannot, strictly speaking, have ideas of spirit, we can have a *notion* of it. He intends by this to contrast spirit with matter: whereas the latter has been shown to be impossible or contradictory, mind is at least possible and intelligible, and we can therefore form some notion of its operations.

The only sense that Berkeley gives to causation is that of active willing. Ideas themselves are inert and passive, incapable of willing, and therefore incapable of causal influence. The supposed material substance in which qualities are said to inhere is also lifeless and passive, and would therefore be incapable of causal influence. Only spirits are active; it follows from this that the cause of all ideas must be some spirit or mind. Some ideas are caused by our own finite minds, as when we imagine ideas; but the vast richness of our other experiences must be caused by the infinite mind of God.

When it comes to his analysis of natural science, in particular physics, Berkeley’s views find powerful echoes in modern instrumentalism. Berkeley argues against essentialism in physics: essentialism suggests that beyond the phenomena or appearances that we observe, the phenomena are caused by and united in an ultimate reality whose essential nature (such as atomic structure, extension, or substantial form) finally explains all phenomena and the necessary connection between phenomena observed to be constantly conjoined. This necessary connection takes the form of logical deducibility. The positing of some kind of essential nature is required to give a foundation to unifying causal laws which are the characteristic aim of science. A causal law of the form “If *A* then *B*”, or “All *As* are *Bs*” does not merely describe the accidental juxtaposition of *A* and *B* in our experience, but aims to identify a necessary connection between *A* and *B* such that we say if *A* happens, then *B must* follow, and if something is *A*, it *must* also be *B*; in short *A* and *B* are connected in a way that could not be otherwise. That there exist such necessary connections between ideas we experience is denied by Berkeley; no such necessary

connection is perceived between phenomena. There are no essential natures in things beyond experience; indeed, it is senseless to posit an essential nature in a reality of things beyond phenomena which would account for the necessary connection of our ideas; all that we ever experience is a succession of ideas among which we perceive patterns, associations and regularities. The search for such unattainable necessary connections only breeds scepticism about the achievements of science when science fails to show that it can establish how the world *must be*. Scientific theories do not present us with the truth about reality—metaphysics and theology do that—rather their value lies in their usefulness as general rules by which we can predict phenomena: what ideas will follow what, and what ideas are invariably found together. By limiting the aspirations of science Berkeley hopes to secure science from scepticism, and at the same time make room for the indispensability of theology.

Ideas are seen by Berkeley as natural signs; the experience of idea X is a sign that idea Y is about to follow; and it is our job to learn what these regularities are and to come to know the rules which correctly map the patterns of ideas; but we must not suppose that we have thereby discovered necessary connections between the ideas that could not be otherwise. That the ideas follow each other in regular order is entirely dependent on the will of God who chooses to present to us ideas in definite regular patterns, the rules of which we can learn. In learning the order of natural signs in science we learn the “language of God”: the signs He systematically presents us with. The experience of getting closer to a fire will be followed by the experience of pain; but the two experiences are not necessarily connected; the relation between the two experiences is contingent; there is nothing about the experiences themselves, or about any further thing which is the cause of the experiences, which means that the juxtaposition of the experiences could not be otherwise. Yet we can trust in God that He will invariably maintain a regular order which it is possible for us to learn. In this way science is seen merely as a more systematic attempt to chart our experience than our everyday understanding, but not different in the kind of knowledge it produces.

It is, however, not true to say that Berkeley gives a regularity theory of causation. Although the mapping of regularities between non-causally associated ideas is the aim of science, real efficient causal influences take place between spiritual substances and ideas.

On Berkeley’s view, the use in science of various terms such as “force”, “gravity”, “attraction”, “cause”, “effect”, and “insensible particles” is harmless provided we do not think that these terms name real entities in the world which explain the causal necessary connection of phenomena or events we experience; such terms should be seen as merely useful suppositions or hypothetical posits which may aid us in making predictions. They do not describe facts about the

world; but we can use them to help us predict phenomena; the phenomena can be understood as occurring *as if* they were facts about reality. From the point of view of facilitating the discovery of the general rules describing the order of phenomena, the truth of what one supposes as a mechanism is to be valued purely for its convenience, and its truth is irrelevant, for its truth as a mere useful supposition does not arise at all. More positively we can say that anti-essentialism encourages us always to seek further explanations because it does not assume there will be, and we might find, some point at which explanations are exhausted and complete.

Nevertheless, the sense in which we can be said to learn the *language* of God gives some residual meaning to scientific theories or laws being true; not every invariable correlation will constitute a law of science; the use of the terms *language* and *signs* suggests a structure that, although not necessary, does have an order of meaning and syntax analogous to that of a language.

Many problems reside in Berkeley's system. It is difficult to see how his proof that God exists can be valid if based on the premise that ideas that are not perceived by our minds must, if they are ideas of real things, continue to exist, and can do so only in the mind of God. No possible empirical evidence could verify the proposition that the ideas constituting object *A* exist unperceived by us. We are precluded from establishing by experience the ontological continuity of ideas constituting sensible objects when we do not experience them by the fact that any attempt to gather appropriate empirical evidence would be self-defeating: we cannot get a sly glance at things unperceived. This is rather like trying to determine whether the fridge light goes off when one closes the door, except that in the case of ideas constituting sensible objects it is a logical impossibility, not an empirical difficulty involving empirically determining if things exist unperceived. If the only guarantee we could have for knowing real things exist unperceived is following a proof that God exists, then a proof of the existence of God cannot, without being circular, use as a known premise that real things exist unperceived when not perceived by us.

The basis for idealism is that all that we ever perceive is ideas or sensations—light, colours, sounds, smells, tastes and the like—which can only be conceived of as existing in the mind. It is this that must be denied in an effective refutation of idealism. We must say that we can be immediately aware of physical objects in perception; what we perceive is appearances or aspects of objects themselves, not other entities called ideas that mediate between us and objects perceived.

If Berkeley were to stick strictly to his empiricism in using as evidence only the immediate content of our own minds, then it is difficult to see how he could avoid extreme solipsism: there is nothing he can be sure of except the nature and existence of the ideas of which he is immediately or currently conscious.

Hume

David Hume (1711–76) was born in Edinburgh, into a family of the minor gentry near the Scottish Border; the family home was the estate of Ninewells, close to the village of Chirnside near Berwick. David Hume's father died in 1713, leaving his mother to bring up David and two siblings, of whom David was the youngest. Their religious education was Calvinist in character with regular attendance at kirk.

Hume entered Edinburgh University in 1723 when not quite twelve. Here he received instruction in Latin, Greek, mathematics, physics and philosophy, and became acquainted with the work of John Locke and Isaac Newton; but he left the university around 1726 without taking his degree. By this time he had arrived at the atheism that was to last for the rest of his life. He returned to Ninewells where, following the family tradition, it was proposed that he turn to law as a profession; but Hume had no appetite for the law and instead spent time studying great classical literature. In 1734 Hume entered the offices of the West India company in Bristol, but his stay here was very short-lived, and he went to France where he could live more cheaply, first in Rheims, and then at the small town of La Flèche in Anjou; here he wrote *A treatise of human nature*. He returned to London in 1737 and after some difficulty eventually found a publisher; the *Treatise* appeared in 1739 and 1740, by which time he had returned to Ninewells. The book did not receive the high level of attention he had hoped, although he exaggerated when he said that "It fell dead-born from the Press." In 1745 Hume's application for the professorship of philosophy at Edinburgh University was rejected. From 1747 onwards Hume earned his living chiefly as a diplomatic secretary, which involved travel abroad. During this time he continued to publish short essays on various topics, and began work on the *Enquiries concerning human understanding and concerning the principles of morals*, in which he sought to rectify the presentational and stylistic deficiencies which he thought had led to the modest acclaim awarded to the *Treatise*; the *Enquiries* was published in 1748. In 1752 Hume became librarian to the Faculty of Advocates in Edinburgh, having been turned down in 1751 for the Chair of Logic at Glasgow despite the support of the vacating professor, Hume's friend, the economist Adam Smith (1723–90); it was as a librarian that Hume began his *History of England*. In 1761 he became a personal secretary at the Embassy in Paris and was extremely popular in Paris society. In 1766 Hume returned to England with the philosopher Jean-Jacques Rousseau (1712–78); however, Rousseau's chronic paranoia and unreasonableness soon caused them to fall out. Hume retired from work in 1769 and lived in Edinburgh. In 1775 he was struck by a fatal wasting disease of the bowels and he died the following year.

Hume's affable disposition while terminally ill was typical of his

general character; he also remained unshaken in his rejection of any kind of survival in an afterlife. Although lean in his youth, in later years he had a rotund physique, and he took pleasure in food and good conversation. Despite having a formidably sharp intellect, he seems to have had a generally amiable, sociable, cheerful personality.

There is a tension which runs through Hume's philosophy between scepticism and naturalism. The sceptical side involves the employment of various arguments showing that we lack any rational justification for beliefs usually regarded as fundamental to our view of the world. There are three beliefs of particular importance that come in for this treatment:

- (a) existence of causation and the rationality of induction
- (b) existence of the external world: bodies continue to exist independently of us in the external world
- (c) existence of a permanent self.

In each case Hume sets out to show that we have no rational justification for the belief, but also how the belief is a fundamental product of the faculty of imagination in human nature. Hume's purpose in revealing the lack of rational warrant is to show the limits of what human reason can account for. The naturalist strand in Hume's philosophy now enters for he does not draw the conclusion that because we lack rational justification for these beliefs we ought therefore to reject the beliefs. It is a fact that we do irresistibly, invariably and universally hold these beliefs, which are the foundation of thought and necessary for our survival; if our holding of these beliefs cannot be accounted for through our possessing sufficient rational grounds for the beliefs, then it is still to be explained why nevertheless we hold these beliefs, think the way we do, and remain unshaken by sceptical arguments directed against them. In short, one possible explanation for why we hold these beliefs is that we have rational grounds for doing so, but where we do not have rational grounds there must be some other explanation for why we have these entrenched beliefs. The explanation is to be found in the science of human nature. This science reveals that the way we come to form these beliefs is the same kind of way as other animals form beliefs; it is therefore quite proper to say that animals reason.

Sceptical arguments or reasoning can operate only against other arguments or reasons; but given that the explanation of our holding certain fundamental beliefs or thinking in certain ways is not to be found in our having reasons at all, the sceptical arguments or reasons against these fundamental beliefs or fundamental ways of thinking find no purchase; rational arguments are simply irrelevant. There is no question that we ought to think differently because we lack rational grounds in these cases, as the sceptic suggests, since nature, specifically human nature, ensures that we cannot help thinking in

these ways; these ways of thinking are *fundamental facts about human nature* which are explained by *non-rational* laws describing how we go on or function; the beliefs thus produced are not thereby *irrational*; they would be irrational only if we supposed that the explanation of our having the beliefs is based on insufficient rational justification and that rational justification is required. We are psychologically constituted in such a way that, given a certain course of experiences, we will inevitably come to hold certain kinds of beliefs.

In our philosophical search for the ultimate foundations for our beliefs we come to see that certain of our most basic or fundamental beliefs are rationally groundless or unjustified; but we also come to understand that they are not the kind of beliefs that can be rationally grounded or justified; therefore the lack of rational justification is not to be thought of as a deficiency in these beliefs. They are not the kind of beliefs which we can be rationally justified or unjustified in holding; so showing there is no rational justification for the beliefs does not show them to be irrational or confused; rather, they are *non-rational*, but beliefs that we must have resulting from the way our natures fundamentally are. This position can be further defended by pointing out that if we enter into the process of giving reasons at all and suppose that it can ever be successfully brought to an end, there must be some beliefs for which reasons neither can be given nor are required; justification has to end somewhere.

An analogy may help. If we take the notion of *love* we can clearly understand that cases may arise where *L* giving reasons to *M* why *M* should love *L* rather than *N* is simply out of place; it is not that *L*'s reasons are bad reasons; reasons of any sort are simply irrelevant and make no difference; it may just be a fact that *M* loves *N* and not *L*, and that is an end to it. One might as well argue with a tree that it is unusually early to come into leaf, or with an avalanche that it is wrong to fall on villages.

This naturalism has serious consequences for anything like Descartes' project for an absolute, non-species specific, objective conception or understanding of the world based on pure reason, not on concepts dependent on our contingent biological or psychological constitution. For it turns out that some of our most basic conceptions and beliefs are not transcendent and eternal, but depend on contingent facts about human nature. Descartes supposes that the fundamental conceptions involved in a truly scientific view of the world are either intuitively obvious or rationally justifiable, and thereby are true universally for any intelligence whatsoever. Hume argues that these conceptions are dependent on human nature being what it is and functioning in certain ways, and without a nature which reacts in certain ways to experience such conceptions or ideas would not arise at all, since they cannot be derived from or justified by universal and valid deductive reasoning or experience. Our

fundamental concepts and beliefs, which we apply to, and regard as real features of, the world, are species-dependent, not non-perspectival and absolute. That we have an idea of, and belief in, causality and induction, a belief in external physical bodies and in a relatively permanent self, depends on our reacting to certain experiences in certain ways; such ideas are neither a product of the pure necessity of reasoning nor derivable from passive observation of the world; our having these ideas depends on experience combining with the way human nature functions.

The tension between scepticism and naturalism arises from the uncertainty as to whether any particular case of a belief lacking rational justification should lead us to reject the belief or lead us to conclude that it is vain and unnecessary to ask for justification. The answer would seem to involve assessing how fundamental the belief is to human nature; that is, to what extent it is universal, irresistible and permanent.

Hume maintains the view common to other philosophers of his period that we are only ever immediately acquainted with the contents of our mind: perceptions. He divides perceptions in the mind into *impressions* and *ideas*. These are to be distinguished not by their origin, but by their degree of force and liveliness; impressions are lively perceptions or experiences and ideas less lively. Impressions are the primary or first appearance in the mind of any mental content, ideas are secondary and derivative weaker copies of impressions. Roughly the distinction is between actually experiencing X, and thinking about X. Fundamental to Hume's philosophy is that ideas, which are, generally speaking, the materials of thought, are faint copies of impressions and that we cannot have a *simple* idea of which we have not had a simple impression. Every simple idea has a corresponding simple impression that resembles it, and every simple impression a corresponding idea; that is, every simple perception appears both as impression and idea. This account has the odd consequence that to think about X (say, a pain) is mildly to experience X (a pain), which is surely false. We can have complex ideas of which we have no corresponding complex impressions, but only if they are made up of simple ideas copied from simple impressions we have had. The reason for this view is that Hume wishes to identify the correct impressions from which we derive ideas. There are two possible sources of ideas: impressions of sensation and impressions of reflection. Impressions of sensation are basically sense-experiences; impressions of reflection are often new impressions which derive from the natural way we react to certain impressions of sensation. If we have an idea which is derived from an impression of reflection in this way, then the existence and nature of the resultant idea partly depend on the workings and nature of our mind, and the idea is not something derived wholly passively from experience of the world. The question is whether we are then

justified in regarding the resultant idea as corresponding to a real feature of the world, or whether the idea does not correspond to a real feature of the world since it is simply a product of the way we react naturally to certain impressions of sensation, which in themselves do not contain that idea. For example we find that the idea of evil and evil acts is not derived from anything observed purely in acts, but results from the impression of reflection, *abhorrence*, we naturally feel, because of the reaction of human nature, at seeing certain acts; that we then regard evil as really in the world, and certain acts as abhorrent, results from the idea of evil being projected onto certain acts in the world, although it is not derived from something observed passively as really being in the world. If we did not react in certain natural ways to produce these impressions of reflection we would not, from observing the world, find any passive impressions of sensation from which the idea of evil could derive.

The meaning of a term is to be found in associating the term with the correct idea. If we cannot find any impression of either sensation or reflection as the origin of an idea which is presupposed in the corresponding term having meaning, then we must conclude that we are deluded when we say we have the idea, and the term which publicly articulates the supposed idea is in fact meaningless. But we must look carefully; if we cannot find an impression of sensation (perceptions of red, chairs, mountains, as well as sensations such as hot, cold, pain) we may well find an impression of reflection (feelings, passions, emotions, basic appetites, such as anger, sadness, hunger) from which an idea we have derives; but this has the important consequence that the true meaning and implications of the term corresponding to the idea may be quite different from what we thought them to be. We will have to conclude that if an idea derives from an impression of reflection or inner sentiment only, then it is not an objective feature of the world, but one that depends on our natural propensity to react to experiences in certain ways according to our human nature.

Hume distinguishes between memory and imagination on the basis of the distinction between impressions and ideas. Memory: the order/sequence and combination of ideas is the same as the original order/sequence and combination of the impressions. Imagination: the order/sequence and combination of ideas can be different from the original order/sequence of the impressions.

The *imagination* is of fundamental importance for Hume's account of why we have the beliefs we do have. The order/sequence and combination with which ideas feature in our imagination is not random but has rules governing that order; there are forces of attraction, which, although not intrinsic to the ideas by themselves, govern the way simple atomic ideas and complex ideas are associated as a result of fundamental propensities of human nature.

Hume argues that all perceptions are really distinct from each other; they can exist at different times; they can thus be conceived existing separately without any contradiction; therefore any connection, if it exists at all, between perceptions is contingent and not necessary. It is the *human mind* that, according to certain natural propensities, associates perceptions which have logically distinct existences and between which no necessary connections are ever discovered by reason or observation; but it is from this *feeling of being determined* to associate ideas in certain ways, which is an impression of *reflection*, that the idea originates of the perceptions themselves being necessarily connected.

Hume sees part of his function as explaining why we hold certain fundamental beliefs; this he does through discovering and calling upon the laws governing the order of perceptions in our minds. The basis of Hume's explanation is the "principle of association of ideas"; this explains why we in fact think as we do, although we may have no rational justification for doing so. Ideas become associated in our minds in specific ways and this controls the order or sequence of thoughts through our minds. There are three main factors that determine which ideas are associated in the human mind:

- (i) resemblance: qualitative similarity
- (ii) contiguity: proximity in space and/or time
- (iii) cause and effect: the thought of one idea leads to the thought of a causally connected idea.

The mind naturally moves smoothly from one idea to another in accordance with these principles of association. If we have an impression of *A*, or entertain an idea *A*, we naturally move to the idea *B* related to it in the highest degree by some or all of the above principles. Ideas are mental atoms among which Hume attempts to describe the rules governing their behaviour.

The objects of human understanding and inquiry fall into two exclusive and exhaustive classes. The distinction is sometimes called "Hume's fork": this contends that all meaningful propositions can be divided into one of two types:

- (I) relations of ideas
- (II) matters of fact and real existence.

All propositions of type (I) concern the abstract relation of ideas, and can be known to be true *a priori* because their denial would involve a contradiction and they are thus necessary. Examples are truths in mathematics and logic. They are intuitively or deductively certain. The examination of the meaning of the constituent ideas of the propositions alone is sufficient to establish their truth or falsity. All propositions of type (II) concern connections between matters of fact and the actual existence of things, and can be known to be true, if at all, only *a posteriori*

by experience, and not through examining the meaning of the constituent ideas alone because their denial does not involve a contradiction and they are thus contingent. Examples are the propositions of natural science and common-sense statements of fact. The price of our knowing propositions of type (I), however, is that they are trivial truths that can tell us nothing about what is actual and contingent, but only what is possible (not contradictory), impossible (contradictory) or necessary (denial is contradictory). Thus we cannot know any truths about the actual contingent or real world *a priori* by pure logical reasoning alone; if we can know truths about the world at all, we must rely on the evidence of experience. Propositions that do not concern either relations of ideas or empirical matters of fact are meaningless.

Closely connected with this is the way Hume shows that we lack reasons for our fundamental beliefs by showing that the only two possible sources of rational justification do not provide reasons for those fundamental beliefs.

(I') *Reason*

Justification by intuitive, demonstrative, deductive or logical *a priori* reasoning.

(II') *Senses*

Justification by the evidence of observation or *a posteriori* experience.

These are exhaustive of the sources of rational justification. Hume purports to show that rational justification from either source, demonstrative reasoning or experience, is lacking for our fundamental beliefs in causation in the world and inductive inference, in the existence of physical objects in the external world, and in a persistent self; thus they cannot be rationally justified at all; nevertheless, the mechanics of the mind are such that we *hold irresistibly* these beliefs so necessary for our survival. Hume's positive contribution is to give an account of why, in fact, given that rational justification cannot account for it, we do hold these basic beliefs.

Why, in particular, do we form beliefs about matters of fact that we have not observed on the basis of what we have observed? Characteristically this takes the form of an inductive inference of the form:

$$\frac{\text{All observed } A\text{s are } B\text{s.}}{\text{Therefore all } A\text{s are } B\text{s.}}$$

or

Therefore the next *A* will be a *B*.

But is there any rational justification for this inference? Take, for example, the propositions "All unsupported bodies fall", "The sun will rise tomorrow", or the propositions "All *A* is *B*" and "If *A* occurs, then *B* must occur". These are characteristic of the propositions of natural

science and common sense. Is there any rational justification for our assertion of these propositions? As it stands the above inductive inference, which might be used to support such propositions, is clearly deductively invalid: it is possible for the premise to be true but the conclusion false. In all such instances we move from cases we have observed to cases we have not observed on the supposed basis of there being a *causal relation*. That is, *A* is the cause of *B*, which supposes that *A* occurring is necessarily connected with *B* occurring.

If the inference from *A* we have observed to *B* we have not observed, and the belief that they are necessarily connected, is to be rationally justifiable, it must be because of (I') reason or (II') the senses. Hume thinks both fail to provide such rational justification.

Hume is clear that the causal connection between *A* and *B*, which describe events in the world, is not explained and rationally justified by (I'): its being logical or deductive. The relation between event *A* and event *B* is not like the relation in a deductive argument between premises and conclusions. If the connection were deductive, and hence logically necessary, then the assertion of *A* and the denial of *B* would involve a contradiction. But in the case of connections of events or matters of fact this seems never to be the case; the assertion of a matter-of-fact connection and its denial seem equally conceivable. The logical relation which holds between a plane figure being three-sided and its being triangular, or its internal angles being equal to 180 degrees, is the kind of relation that would, if it applied, make a connection necessary and enable us to justify rationally the inference to cases we have not observed from cases we have observed; but such a relation does not hold between events in the world corresponding to our ideas of them *A* and *B*. *A* and *B* can exist at separate times, therefore *A* and *B* are separable in thought; the existence of *A* can be supposed without supposing the existence of *B*, and the assertion that *A* is always found with *B* is therefore a contingent, not a necessary, truth. In short, if it is ever the case that *A* and *B* can exist at different times, we can conceive of *A* and *B* as separate, and any connection between them cannot be necessary.

It might seem as though the causal relation is deductive, and thus we can know *a priori* the connection between *A* and its causal consequences *B* because we know the kind of thing *A* is: say a billiard ball. But the question arises as to how we know what kind of thing *A* is. Hume argues that in the case where *A* is something entirely new to us, we can know that *B*, or anything else, will follow only by *experience*. Logically speaking, apart from what would be logically contradictory anything could happen. If it seems as though we can deduce *B* from *A*, this is because we have already observed the behaviour of *A*-like things and included in the definition identifying *A* as *A* (what is an *A*) the relation to *B*. We cannot from examining *A*-in-itself or alone prior to any experience of *A*, before a characterizing definition of it that may

include *B* as a causal consequence, deduce what will follow. In identifying *A* as an *A*—as something of a certain sort—we already have to include certain potential causal consequences; we cannot separate what we mean by an *A*—what *A* is—from all its causal consequences. To show that we could by pure reason alone deduce *B* from *A*, and yet by this produce new non-trivial knowledge, we would have to define *A* independently of its causal consequences, but this is impossible if what we mean by an *A*—and hence use to identify something as an *A* in the first place—must include the range of *A*'s causal effects. That certain causal consequences are connected with *A* is not something that can be known *a priori*.

Alternatively it might be the case that we make the inference from *A* to *B*, and are rationally justified in doing so in accordance with (II'), because we observe in experience a necessary connection between *A* and *B* when observing the conjunction of an instance of *A* and *B*, or *B* following *A*; but in fact we observe no such necessary connection between *A* and *B*, but simply observe *A* and *B* occurring together. The hammer is thrown, hits the window, and then the window breaks; there is no necessary connection observed as part of this, but rather a sequence of logically distinct events. We observe no necessary connection between observed matters of fact themselves, but only events conjoined with or following one another. Nevertheless, we still believe some events and ideas to be necessarily connected, and it remains to be explained why we do so.

Partly the formation of beliefs about the unobserved on the basis of the observed is founded on the principle that "Every event has a cause". But Hume shows that this principle lacks rational justification by showing that it cannot be justified either by (I') or by (II'); this applies Hume's fork. First, it is not a necessary logical truth, since its negation does not imply a contradiction; the assertion of an uncaused event is conceivable. He notes that the assertion of an uncaused event does not involve the contradictory assertion that the uncaused event is *caused* by "nothing", rather it asserts that the event has no cause at all. Second, it is not a truth that can be known empirically, since it can be neither established nor refuted by experience; logically there is no hope of examining all cases. It cannot be confirmed because we cannot examine all cases to show every case has a cause; it cannot be refuted because in any given case we cannot examine and exclude everything that might be a cause.

If the causal relation between *A* and *B* is not deductive, then the move from the observed to the unobserved on the basis of observed *As* and *Bs* is an inductive inference, and if the assertion of general propositions such as "All *A* is *B*", or "If *A* occurs, then *B* must occur", is to be rationally justified, then they depend on some kind of "uniformity of nature principle": that conjoined events that we have observed will hold in cases we have not observed. Thus, events that

we have observed to be constantly conjoined in the past will continue to be so in the future. In short, the uniformity principle asserts that the laws of nature will hold in cases we have not observed, and the future will resemble the past. The acceptance of the uniformity principle would make the inference, from cases we have observed to those we have not, rationally justified—the inference would be valid—by acting as a required premise in the inference from instances we have observed to those we have not observed.

All observed *As* are *Bs*.

Uniformity principle: past conjunctions will continue in future.

Therefore all *As* are *Bs*.

or

Therefore the next *A* will be a *B*.

But what is the rational justification for the truth of the uniformity principle itself? Again Hume's fork is applied, this time in testing the uniformity principle. First, if the uniformity principle were a logical truth, then its negation would be a contradiction, its denial inconceivable; this is clearly not the case; it is certainly conceivable that any law which has operated in all cases until now should cease to operate in the future and should fail to operate in cases we have not observed. The uniformity principle cannot be known *a priori*. Secondly, the uniformity principle, if it is itself merely a further matter of fact, cannot be justified by experience for any such attempt will be irredeemably circular. We might try to justify the uniformity principle by experience *a posteriori* by saying: the uniformity principle itself has always operated or held in the past, and so it will continue to operate or hold in the future, therefore the uniformity principle is justified by experience. In applying this to the uniformity principle itself such a justifying inference is circular, since it is exactly the kind of inference which depends for its validity on accepting the uniformity principle: that past observations *are* evidence that the future will operate in the same way.

The startling conclusion that Hume draws from his analysis of our belief in unobserved matters of fact is that such beliefs lack all rational justification, and thus having a rational justification is not responsible for our making the inference from observed *A* to unobserved *B* following the observation of *A* and *B* conjoined in the past. We do not make the inference from *A* which we observe to *B* which we do not observe because we are rationally justified in doing so. Nevertheless we *do* make the inference, so there must be some other explanation for why we make it.

Hume gives on the one hand an account of causation and what is involved in the idea that events are causally connected, on which all

moves to unobserved matters of fact depend; and on the other hand an account of the conditions under which we hold the belief that events are causally connected.

- C' (a) spatial and temporal contiguity
 (b) temporal priority: cause comes before effect
 (c) necessary connection between cause and effect
- C'' (a) observed spatial and temporal contiguity
 (b) observed temporal priority: cause comes before effect
 (c) observed repeated constant conjunction.

The reason for these accounts is that Hume wishes to argue that C' describes the necessary and sufficient conditions for events being causally linked and what is involved in the idea that they are, but we come to hold the belief that they are causally connected in just those conditions or circumstances described in C'', and those conditions or circumstances do not rationally justify the belief as true, nor is there any other way of doing so.

When we believe *A* and *B* in sense C' to be causally connected:

- (1) We make the inference from observed *As* and *Bs* to unobserved *As* and *Bs*.
- (2) We believe or expect, not merely think, that *B* will occur following a fresh observation of *A*.
- (3) We believe the connection between *A* and *B* to be a necessary connection: that it could not be otherwise.

We do not have any rational justification for the inference involved in (1), for the relation between *A* and *B* is neither logical nor justified by experience. We have no rational justification for the belief (2), since it cannot be based on either logic or experience. We do not have any rational justification for the belief (3), since the relation is not logically necessary, nor is a necessary connection between instances of events *A* and *B* something we observe in experience of *A* and *B*; we observe *A conjoined* with *B*, but we do not, as a feature of our experience of them, observe any necessary connection.

So (1) our *making the inference* from *A* to *B*, and (2) our *belief that B* will follow an observation of *A*, and (3) our belief that *A* and *B* are *necessarily connected* are not explained by our being rationally justified in the inference or the beliefs. Hume's conclusion is that these are not a matter of rational justification at all. It still remains to give an explanation of these matters.

The explanation Hume gives returns us to features of human nature, the principles of the association of ideas and how we react to certain experiences. The explanation in all the cases (1), (2) and (3) derives from habits or customs of the imagination: mental habituation. This tendency to mental habituation is a propensity of human nature. The basis of the explanation is that *repeated observation* of the constant

conjunction of *A* with *B* as in *C''* sets up a habit of association in the mind of *A* and *B*, and it is this that leads us to (1) make the inference from *A* to *B* in cases we have not observed, (2) believe that *B* will occur having had a fresh impression of *A*, (3) believe that *A* and *B* are necessarily connected.

Hume gives an account in *C''* of the circumstances or conditions in which we *in fact* come to judge that *A* and *B* are causally connected, rather than where we are rationally justified in so doing. The explanation of our belief in causal connections then derives from the product of those circumstances and our natural reactions in those circumstances. Following the repeated observation of the conjunction of *A* and *B* in our experience in accordance with the conditions *C''* there is set up in our minds the habit or custom of associating *A* and *B*; and these are just the circumstances in which we say *A* and *B* are causally connected. Taking points (1), (2) and (3) above in turn, Hume gives the following accounts.

(1) *Making the inference from A to B*

It is just a *fact* about our fundamental psychological constitutions that in circumstances *C''*, following the observed repetition of *A* and *B* in conjunction, we *do make* the inference from *A* to *B*. The repetition of *A* and *B* constantly conjoined in our experience sets up a habit or custom such that on the observation of *A* we compulsively move to the idea that *B*. Thus we infer the idea of *B* from the idea of *A* in cases we have not observed, but the move is not a rational move at all, since it is neither deductive nor justified by experience.

(2) *Believing that B will follow A*

To understand our expectation or belief that *B* will follow *A* on observing *A* in conditions *C''*, we must understand what a belief is for Hume. He explains a belief as being just the degree of liveliness or force of an idea, and not a difference in, or addition to, the content of an idea; the difference between merely conceiving or thinking *X* and believing *X* is a matter of the force and liveliness with which the idea of *X* strikes us. In the case of believing *B* will follow *A*, Hume's explanation is that there is a transference of force by a kind of inertia from the fresh impression of *A* to the idea that *B*, which enlivens *B*, where the habit of associating *A* and *B* exists, and this turns the mere thought of *B* into a belief or expectation—a lively or vivid idea—that *B*. It should be pointed out that sometimes Hume presents a somewhat different theory of belief, whereby it is a difference of attitude towards an idea, or the manner in which an idea is conceived or entertained, which constitutes believing an idea, and which makes believing something feel different from an imagined fiction: it is an idea being more strongly or vividly conceived or entertained that

constitutes a belief in an idea, rather than a difference in the vivacity of the idea itself. It is not clear if these two theories can be reconciled: in the first theory, belief is a matter of how an object of thought strikes us, in the second theory it is a matter of how we take hold of the object of thought.

(3) *Believing that A and B are necessarily connected*

The inference of *B* from *A* is not based on the necessary connection of *A* and *B*; rather, the idea of the necessary connection of *A* and *B*, essential to the belief in a causal relation *C'*, depends on our *in fact compulsively making* the move from the impression or idea of *A* to the idea of *B* following the repeated observation of the conjunction of *A* and *B* as in conditions *C''*. We have no impression of a necessary connection between *A* and *B* derived from observing the conjunction of *A* and *B* themselves: we just see *A* happen, then see *B* happen. But if the idea of necessary connection, and hence our belief in causation between events, is not to be a delusion and meaningless, there must be some impression from which it derives. The idea of necessary connection derives from a new impression of *reflection*, which in this case is *the feeling of determination* resulting from the mental habit of our passing from the idea of *A* to the idea *B*, following previous *repeated* observation of the constant conjunction of *A* and *B*. The idea of necessary connection does not correspond to anything in the impressions of *A* and *B* themselves, nor does it arise from the perceived repetition of their conjunction *alone*, which would in itself produce no new impression; it corresponds to a new impression of reflection which is a generated feeling of determination, as we habitually pass in the mind, because of an associative propensity of human nature, from the idea of *A* to that of *B*, on having repeatedly had experience of the conjunction of *A* and *B*. The idea of necessary connection, and that of causality which depends on it, would not have arisen at all, because there would have been no corresponding impression from which it could arise, except for the propensity of human nature to produce a suitable new impression of reflection; no impressions of *A* and *B* would alone be sufficient to give rise to the idea of necessary connection. There is no circularity involved in this account: the idea of necessary connection derives from the *feeling* of determination, whether there is actually any determination or not, because we in fact move and have a propensity to move from *A* to *B*, which establishes a habit in our minds, following exposure to the repeated observation of constant conjunction of *A* and *B*. That the idea of necessary connection derives from an impression of reflection or feeling in this way has a very important consequence: that the necessary connection, and therefore causal connection, that we suppose to exist between events themselves and our ideas of those events is, in fact, *in the mind*, not an

objective feature of the world; it is something we project onto the world owing to habit, not something observed in events in the world, and it is falsely regarded as an objective feature of the world or real relation connecting events we observe.

In sum, the belief in causal connections, which includes necessary connection, depends on our natural movement from one idea to another, not the other way around.

Hume gives an analogous account of the remaining fundamental beliefs (mentioned at the beginning of the Hume section): (b) the existence of the external world: bodies continue to exist independently of us in the external world and (c) the existence of a permanent self. The strategy is the same: we have no rational justification for these beliefs through reason or the senses, but nature through the imagination has ensured that we have these beliefs, and human nature gives an account of this non-rational mechanism. We believe that there are bodies existing continuously and independently of us, and that we are the same self over time.

Hume begins by saying that it is vain to ask if bodies (external material objects) exist or not, since we cannot help believing that they do; the question of interest, therefore, is what accounts for having that belief. The belief in the external world is constituted by a belief in objects that exist continuously (when not perceived, for example) and exist independently of perceivers. Reason cannot justify this belief: not only is it not the case that most people use rational arguments to come to this belief, but also it is not possible to give a demonstrative proof that the external world exists such that a denial would be a logical contradiction. The senses cannot justify the belief: all that we have, if we examine our sense-experiences or perceptions carefully, is impressions which are perishing (non-continuous or interrupted) and dependent (internal or mental) for their existence and nature on perceivers. All that we are aware of is perceptions which are perishing and dependent; we do not perceive any objects distinct from impressions. So what features of our perceptions lead us to believe, or produce the belief, that our impressions of sense are of external material objects which do exist continuously and independently of us? It is not the force or involuntariness of certain impressions that accounts for the belief, for these are features of impressions, such as pains, that we do not suppose exist independently in the external world. The features of our sense-experience from which the belief derives are the *constancy* and *coherence* of certain series of perceptions which lead the *imagination*, operating according to certain propensities of human nature, to overlook the fleeting and internal nature of impressions. The series of perceptions can be *constant* in that there are resembling collections of perceptions in a series even though there may be gaps between them, as when I look at the table in my room, go out

and come back and look again. The series of perceptions can be *coherent* in that although the collections of perceptions in a series change, they do so in a predictable way, as when I come back to my room and find the fire has burnt down as expected. First, we resolve the conflict between the gaps in our perceptions and their constancy by regarding the gaps as only apparent, with the object of our perceptions really continuing to exist in the gaps. Second, we explain the coherence of our perceptions by the supposition that the objects perceived exist constantly and independently in the gaps when not perceived.

Our belief in continuous and independent objects is one in something that preserves identity through time; this would strictly involve perceptions which are invariable and uninterrupted. We have bundles of perceptions which, although perishable and interrupted, also exactly resemble each other and thus they exhibit constancy. Because these bundles exactly resemble each other the human mind overlooks the gaps and lazily treats them as if they were the same uninterrupted perception. Thus we come to form the belief in, or lively idea of, continuous and independently existing objects corresponding to these bundles of perceptions; the belief or lively idea which fills the gaps itself derives its liveliness from the resembling impressions either side of the gaps in our perceptions. In short, we naturally and habitually confuse a series of interrupted but resembling perceptions with the alike single continuous perception that would be invariable and uninterrupted, and thus believe that sensible objects exist as continuous and independent objects.

The belief in the self, or a personal identity that persists over time, receives similar treatment. Its existence is indemonstrable by reason. Through experience when we look into ourselves we do not perceive anything corresponding to the permanent self, or spiritual substance, in which perceptions inhere, but only particular fleeting perceptions themselves. The human mind is really a bundle of distinct perceptions between which we perceive no real or necessary connection. The explanation for the belief in the self which we nevertheless have arises from the natural association of ideas which is a product of the perceptions themselves with unavoidable wedding or associative propensities of human nature, giving rise to an impression of *reflection* which is a feeling that the ideas are connected; but this association of ideas and the consequent feeling of connectedness between the ideas depend on us and our nature, and the connection is not a real connection between the ideas themselves. It is from this *feeling* of connectedness, which is an impression of *reflection*, that the idea of the mind being unified in a single self, which is a continuous and unchanging thing, arises and is ascribed to what are really separate and variable perceptions; this leads us to mistake what is really a collection of logically distinct perceptions for something that is connected in a unity and has identity.

Generally we cannot know if the connections we feel exist between perceptions are real, for we never perceive necessary connections existing between them, but merely perceive one following another. In fact, we know perceptions to be distinct existences or atomic; they are able to exist independently of each other without logical contradiction. The idea of connection between them is just a copy of a parent impression of reflection—the sentiment or feeling of determination in the mind as we naturally associate ideas—but we can have no knowledge of whether the connection actually holds.

Nature has taken care that we hold our most fundamental beliefs. We irresistibly believe in causation and inductive inference, and believe in the existence of independent continuous external bodies and a persistent self, even though we have no rational justification for the beliefs from reason or experience. Thus nature ensures that the arguments of the sceptic find no purchase against processes that are not a matter of rational justification at all but are a matter of deep instincts in human nature.

CHAPTER SIX

Transcendental idealism: Kant

The German philosopher Immanuel Kant was born in 1724 into the midst of the European Enlightenment. The Enlightenment meant different things in different countries, but certain common features can be discerned. Kant referred to the Enlightenment as European man's coming of age; the assurance with which man had known his place in the universe was being destroyed for ever. This did not mean the replacement of one doctrine by another in which man could at least find a place, no matter how unpleasant it might be; man was cast adrift in a void, there to be dependent only on his own resources. The Enlightenment questioned the right of anyone at all to claim a monopoly of truth; this throws the decision as to what is the truth back on the individual. The abandonment of authority as the source of truth leads to a profound search as to the origins and justification of our beliefs. The eighteenth century is marked by many embarking on this search full of hope, confident that human reason has the capacity to provide answers and discover truths. It led many thinkers who were intelligent and honest in their deliberations to scepticism; an inability to see how claims to human knowledge can be justified.

Developments in astronomy, with the work of Copernicus in the sixteenth century, had already begun to undermine the medieval edifice which gave man his defined place in the universe. The Great Chain of Being, with God at its summit, stones at its base, and men and angels in between, was dismembered. The Sun, not the Earth, was the centre of our planetary system, situated in a universe of unthinkable immensity and man was denied his privileged place in it. Newton's synthesis of the astronomy of Copernicus and Kepler, and the terrestrial mechanics of Galileo, gave no one a privileged position; laws of nature are objectively and uniformly true in all places. There was also no need for a God to maintain the activity of the universe

since it was relatively autonomous, like a clock, and perhaps only required someone to wind it up periodically; but this diminished God's influence to a point where He could be dispensed with, even if a highly religious man such as Newton did not wish to do so. The religious scientist must now serve God through the humble task of uncovering the wonderful order bestowed upon the universe by the Creator at its inception. However, a tension had now emerged in discoveries that appeared to reveal the magnificent workmanship of God's universe, but that at the same time made belief in God optional, since God's intervention in the universe, except perhaps at the very beginning, of which we knew nothing, was not required in explanation as it had been before.

Out of the Enlightenment we may evolve a criterion separating the religious from the non-religious, a criterion based on a more fundamental notion than the existence and authority of God. This can be based on whether it is thought that the universe has some special place or concern (negative or positive) for human beings. It is a universe unresponsive to all human values, one to which human values are simply not applicable, an amoral universe, that gives rise to the crisis begun for man in the Enlightenment. Some reject this aspect of the Enlightenment and continue in acceptance of God, although for many it can never be quite the same; others embrace the idea of an entirely amoral universe, and suffer the problems of discovering what, if anything, can then have value; still others act merely *as if* the universe still responds to human values; they live under the shadow cast by a figure that has already left the scene.

It would be wrong to think of all the most revolutionary intellectual figures before and during the Enlightenment as free-thinking atheists; some of the most important figures were Copernicus, Descartes, Locke, Spinoza, Newton, Leibniz, Berkeley, Kant, and all were religious men to varying degrees and in different ways, men often profoundly worried about where their thought seemed inexorably to be taking them; this sometimes forced them to take rearguard action against the consequences of their own thoughts. They all contributed to the complete change in man's world-view, whether they intended to or not.

Kant both benefited from, and went beyond, the Enlightenment (*die Aufklärung*). After an initial immersion in the rationalist philosophy of Leibniz, Kant could no longer accept it; under the influence of Hume, and the German Crusius, Kant says he was woken from his dogmatic slumbers. Another powerful influence on Kant was Newton. Before devoting himself to philosophy, Kant had been a scientist; he saw the effect that a Newtonian view of the universe was going to have on morality, God, and our freewill. For if Newtonian views were universally and rigorously applied, they left little place for God, and undermined morality in fundamental ways: a Newtonian universe was

an amoral mechanical system in which objective values seemed to have no application; man himself was an entity subject to the universal remorseless laws of nature, whose actions were absolutely determined by events that had already occurred, and which were thereby always outside his control; whatever we may *feel* about the matter, we are not free to choose, and where there is no freedom there is no responsibility for action, and thus there can be no moral evaluations. A tree is not free to choose, despite being alive; so when it falls on someone, the event is neither moral nor immoral, it is amoral, just something that happens. Human actions were now in danger of becoming just things that happen.

Kant tried to respond to all these influences, and reconcile them in a new synthesis. The empiricism of Hume had, it seemed to many, led to scepticism about human knowledge, identity and freedom, and Kant could not accept this. The rationalist view argued that there were innate principles of the understanding or reason with which man could *a priori* comprehend the basic nature of the world, although not the world of appearances, but a real world that lies behind appearances which ultimately explains those appearances. Hume undermined this by showing that these principles either were analytic—restating what, in disguised form, had already been assumed—or went beyond being analytic and could not therefore be justified by reason alone; but Hume found they could not then be justified by experience either. There was no midway course for empiricism.

Kant set out to show that these views could be reconciled; he tried to show why the true nature of the relationship between experience and the world is such that we can know things about the world of appearances *a priori*—truths knowable independently of the evidence of experience—although we can have no *a priori* knowledge of a real world beyond appearances. Kant wants to show that we can know certain truths *a priori* which are not trivial logical truths known merely because of their formal structure. We can know the truth “If p then q , p , therefore q ” *a priori* precisely because we can substitute uniformly any propositions we like for p and q ; but for that same reason such logical deductions can, independently of experience, tell us nothing about the world. Our ability to know them *a priori* derives precisely from the fact that they commit us to nothing about the actual world. Kant thinks he can show how we can know universal necessary truths *a priori* about the world as it appears, although not the world as it is in itself.

Kant draws an analogy between his own revolution in philosophy and that of the Copernican revolution in astronomy, but only in the following respect: Copernicus had dared to suggest that some of the motions of the heavenly bodies were only apparent and were as a result of the motion of the observer. Similarly Kant suggests that

some of the properties we ascribe to external objects are a result of constructive mental processes to which appearances have to conform. The philosophy propounded by Kant also attempts to be universally valid in covering all self-conscious rational beings. Kant proposes that our experience involves elements partly contributed by us, and partly by the world; this does not mean our conception of the world is merely subjective in being true only from a particular point of view, or that it is absolutely objective, since the conception of the world cannot be separated completely from ways that we experience the world.

Kant

Immanuel Kant (1724–1804) was born in the Prussian town of Königsberg, into a pietist Lutheran family; there he became Professor of Logic and Metaphysics in 1770, at the age of forty-six.

Kant is frequently seen as almost a caricature of the popular conception of a philosopher; outwardly his life was the very model of the fastidious, studious, self-contained philosophical speculator. There is no doubt that like many original people he was capable of great acts of self-discipline. Yet he was not an unsociable man, or an unentertaining lecturer; he was fond of female company, although he never married. He never ventured many miles from Königsberg. His life is therefore depicted as being, on the whole, dull and uneventful. This may well be true; we should temper this somewhat patronizing conclusion by reflecting that many of us do not have lives a great deal more exciting. Near the end of his life, when he had already been withdrawn from society for some time, Kant's intellectual powers crumbled; he failed to recognize friends, and he was virtually blind; yet those closest to him still had glimpses of his good nature and will power, and of the great philosopher behind the shell of the man that remained.

A discussion of Kant's epistemology and metaphysics naturally centres upon the *Critique of pure reason*, his most complete thinking on these subjects. An additional work on the same subjects is the *Prolegomena*. Kant published many other works on science, aesthetics, and on ethics.

Kant, to some extent, saw himself as solving the errors committed by Hume and Leibniz. Hume's philosophy has been interpreted by some as collapsing into scepticism; central claims for human knowledge, which are logically presupposed by natural science, are found to be unjustifiable on the basis of his empiricist philosophy whereby all such claims must be rationally justified either by pure reason *a priori* or by the evidence of experience *a posteriori*. Neither is found to provide such rational justification, although nature takes

care that we nevertheless hold the required fundamental beliefs. Not only did our common-sense beliefs about the world become unsupportable, but the most powerful intellectual achievement of the day, Newtonian mechanics, was also undermined. Newtonian mechanics seemed to give a complete unifying explanation of the workings of the universe; it was revolutionary in regarding the universe not as operating under special laws for different regions, but as being unified throughout under one objective set of laws. Kant saw this as supremely worth defending against Hume's scepticism. Knowledge for Kant, as for Leibniz, had to be necessary and universally valid. Hume undermined this, leaving us with knowledge of the world, in so far as we could have any at all, which was subjective, particular and contingent. The most important basic beliefs about the world could not be justified by reason, but if we examined closely what we actually experienced—the information provided by experience—they could not be justified by experience either. The most important basic beliefs in question were: the belief that the world operates by necessary causal laws, so we can make inference beyond what we presently perceive to unobserved cases; the belief that there exist independent continuously existing objects; and the belief that there is a continuous self. In short, empiricism, with its adherence to the view that experience must be the sole source of evidence about the world, led to scepticism when it was found that experience in itself, if carefully examined, was not sufficient to justify some of our most basic beliefs about the world.

Kant was convinced both that, contrary to Leibniz, knowledge of the world had always to be concerned with the world of our experience, not a reality beyond appearances, and that, contrary to Hume, the senses were not alone as a means of justifying our knowledge of such a world. The way out of this is to deny that sensation and experience are one and the same. Kant's basic idea is a distinction between form and content; the form of our experience is knowable *a priori*, the content is given *a posteriori*, and only in combination can these provide knowledge of the world. We could not have knowledge of a world other than the experienced one; but sensation alone could not support our claims to knowledge. Sensation is always particular, changing and subjective, and our knowledge claims are general, universal, unchanging and objective. Leibniz was impressed by the power of mathematics; maintaining a distrust of the senses as a source of knowledge that led back to Plato, Leibniz sought a metaphysics that describes the fundamental or underlying nature of the world beyond appearances, which was independent of the evidence of experience, based on a few basic principles; the world of appearances is explained ultimately through the reality that lies behind it; it is this reality which is the metaphysical foundation for all other knowledge of the world. This is not to say Leibniz thought that

humans could deduce all scientific laws from *a priori* metaphysical principles; such *a priori* principles are too general and the *a priori* principles and reason describe not appearances but the reality underlying those appearances. Metaphysics seeks to describe what the world must fundamentally be like if it is fully rationally explicable.

Kant thought Newtonian mechanics explained not a reality behind appearances, but those appearances themselves; the question was how this was possible in the light of Hume's attack on our ability to justify through examining our sensations the kind of necessary universal laws Newton proposed, and the application of such laws to experience. It could not be achieved through Leibniz's philosophy, for Hume had also shown that the machinations of pure reason alone could not generate any new knowledge concerning what is actual; a pure logical argument unpacks only items that are already contained in its premises. The finite ability of the human mind may give us the impression that something new is arising; but it is already there; for God there would be no point in doing mathematics, or logic, or playing chess; He would already know all the consequences.

There were other intellectual structures that Kant thought it necessary to defend: Euclidean geometry, absolute space, continuous infinite time, the applicability of mathematics in explaining the world. Underlying Newtonian mechanics especially are the concepts of causality and substance. Each area of human inquiry has its limits; one Newtonian limit consisted in not questioning the existence of matter, but instead concentrating on how all posited matter behaves. But without the establishment in reality of a general concept of an independent, self-subsisting stuff, Newtonian mechanics is left entirely hypothetical: *if* the world is a certain way *then* these are the laws of its behaviour. In addition the justification of general laws as such had to be attempted: universal causality, which allows us to go beyond seeing that this follows that to saying that this always causes that, and so make inferences to cases we have not observed. Hume thought that rational justification for our beliefs could lie only in either reason or experience; but neither reason nor experience could justify our belief in an external world of bodies, substance, causality, or the self of personal identity; we could only show how they in fact arise as natural beliefs in response to the experiences we have. It is just these general concepts or categories that Kant aims to show we are justified in applying necessarily and objectively to the world we experience, although that application could not be justified, or refuted, by experience.

It must be emphasized that Kant thought that in some areas of human inquiry some final answers had been generated. The world did obey Newton's laws, Aristotle's logic said all there was to say about logic; space was Euclidean and three-dimensional, time was classical and stretched like an infinite straight line towards the future and back

into the past; causality did apply universally. All these things have been questioned by modern thinking; Einstein questioned Newtonian space, time, and motion; quantum mechanics questioned universal causality; modern logic generated a richer array of theorems, making Aristotelean logic a small fragment of it. Kant was not narrow-minded, but Newton's world-view in particular was so powerful and all-encompassing in its unified explanations of a vastly diverse range of phenomena that to be overwhelmed by its finality was understandable. Nor must we let Kant's adherence to these particular theories detract from his important and revolutionary views.

Kant's *Critique* is, roughly, divided into two parts: the Analytic and the Dialectic; the Analytic includes the Aesthetic. The word "aesthetic" derives from a Greek word *aesthesis* relating to perception by the senses. The special Kantian sense of "Aesthetic" concerns the *a priori* form or order necessarily imposed by our capacity to receive representations—our sensibility—on the material supplied by the senses. The form or order is *a priori* and necessary, and Kant discovers it by subtraction of both the material of sensation and the concepts contributed by the faculty of understanding. These pure forms of sensible intuition or of experiences turn out to be space and time. The Analytic is largely positive; in it are determined the *a priori* principles of the understanding; we are also shown the proper use of metaphysics in providing the basis for our objective knowledge. The Dialectic is largely negative. We are shown the misuse of metaphysics in using concepts to go beyond what we can possibly experience, to a world of illusion and contradiction; we are also shown why we are prone to be tempted to this kind of speculation. The Aesthetic and Analytic give us a metaphysics of experience; they display what must be the basic features of experience and reasoning. The Dialectic shows how we err when we attempt to extend our knowledge beyond that which it is possible for us to experience.

We now turn to examining some well-used terms in Kant's *Critique*. These divide into three pairs: *a priori/a posteriori*, analytic/synthetic, necessary/contingent. First we distinguish *a priori* statements, which once understood can logically be known to be true prior to, and independently of, the evidence of experience, from *a posteriori* statements, which once understood can logically be known to be true only by the evidence of experience. Analytic statements are true in virtue of the meanings of the terms in the statements and are known to be true merely by understanding the meanings of the terms contained in the statements; synthetic statements cannot be known just by examining the meaning of the terms in the statements. Generally speaking, although it is this that Kant will question, necessary statements (those that must always be true or must always be false) are *a priori* analytic, and contingent statements (those that may be true or may be false) are *a posteriori* synthetic. Thus, "All

bachelors are unmarried" is *a priori* analytic; we can know it to be true without consulting our experience, nor could any experience refute it, for the meaning of "bachelor" includes "unmarried"; if someone was suggested to us as an example of a bachelor who was married, we would respond by explaining how we define "bachelor", not by seeking empirical evidence. Analytic truths are those truths whose denial is contradictory; the predicate "unmarried" is contained in the concept of the subject term "bachelor". However, "All bachelors admire Kant" may be true, or it may be false; the way we find out is by empirically investigating bachelors; it certainly is not part of the definition of the term "bachelor" that an admiration or otherwise for Kant should come into it, and so it cannot be known to be true *a priori*.

Hume thought that the only necessary propositions were analytic ones (mathematics, for example); but the price we pay for our only pieces of necessary truth is that they are quite empty; they tell us nothing about the world. They simply unravel linguistic definitions. Logical truths such as "not-(*p* and not-*p*)" are known to be true *a priori* precisely because they exhibit a universally valid form which is devoid and independent of content; any proposition could be substituted for *p*, therefore the whole expression can tell us nothing about the actual contingent world. Logic alone can tell us only what is necessary, impossible or possible, not what is actual and contingent: that which is, but might have been otherwise. Hume argues that all our knowledge of the world must come from the senses; but all we can generate from that source is contingent particular statements which cannot support general necessary statements, such as the reality of universal causation, the truth of universal laws, the real existence of an independent constant external world. If we observe *A* followed by *B*, we note that we perceive no necessary connection between *A* and *B*, which is an essential part of the belief that *A* causes *B*, that would justify saying *B* must always follow *A*; but this is the form of universal laws of nature and the basis of any inferences from the observed to the unobserved.

The disagreement between empiricists such as Hume and rationalists such as Leibniz centres on whence our knowledge of the world derives, on what knowledge of truths about the world logically depends, and on the emptiness of analytic propositions. In general, the issue is that of the informativeness of truths knowable independently of the evidence of experience: whether such truths can tell us anything about reality. The rationalists see analytic truths and deductive reasoning as an *a priori* source of knowledge, admittedly not of the ephemeral world just as we experience it, but of the reality behind those experiences. Leibniz has a problem maintaining any *a posteriori* synthetic truths at all, since he thinks all truths concerning underlying reality must ultimately be analyzable into the subject-predicate form

and be analytic. Unlike the rationalists, the empiricists see analytic truths as empty or trivial statements, which can tell us nothing about the actual contingent nature of the world.

Kant found himself agreeing and disagreeing with both parties. He agrees with the empiricists, and disagrees with the rationalists, that *a priori* analytic truths are empty, and that our knowledge must be of the world we can experience; but he also thinks that we can know necessary and universal *a priori* truths that tell us something about the real or actual world of experience. Kant agrees with the rationalists that not all *a priori* knowledge is empty, but disagrees that this knowledge can be of a world behind appearances. The answer for Kant is the existence of propositions that are synthetic *a priori* and in some way necessary; these truths, knowable prior to the evidence of experience, are irrefutable by any experience, and yet they go beyond the mere meaning of the terms used in expressing them and determine *a priori* certain truths concerning the world as experienced. The necessity and universality of the truth of synthetic *a priori* judgements cannot derive from their being analytic and their denial implying a logical contradiction; they must be necessary and universal truths for some other reason. Kant's positive project, his transcendental philosophy, is to show how it can be possible to know truths *a priori* which are necessarily true of the world as it appears, but which are not necessary by merely being analytic. Such a synthetic *a priori* truth is that every event has a cause.

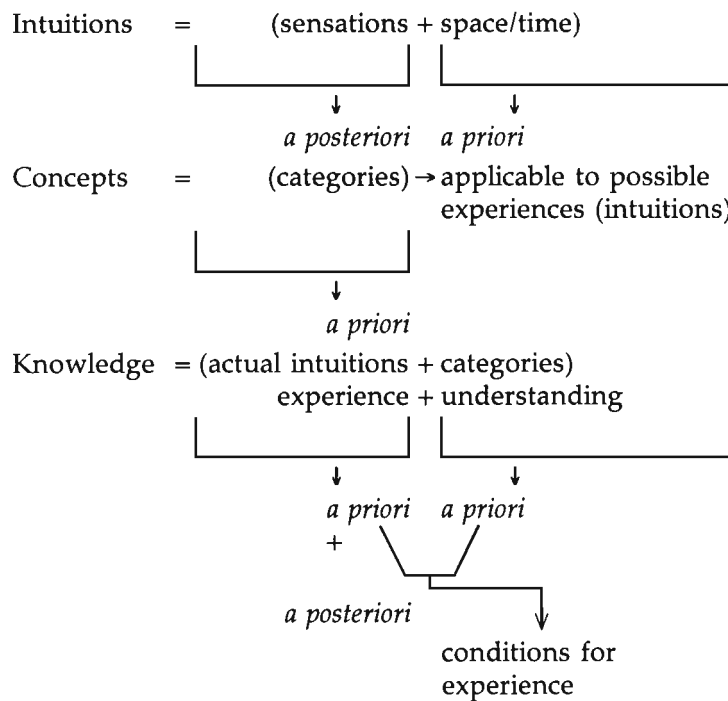
The term "transcendental" does a lot of work in Kant's philosophy. Generally whatever is transcendental is not derived from, or justifiable or refutable by, experience, yet is applicable to, or is a condition for, all experience. Transcendental knowledge is knowledge not of objects, but knowledge of the necessary *a priori* conditions of our cognition of objects. Kant uses the term to denote the *a priori* factors in our knowledge.

Kant analyzes experience and understanding in order to justify objective knowledge. Intuitions consist of sensations which are necessarily subject to the forms of space and time; sensations are *a posteriori* and space and time are supplied *a priori* by our sensibility or capacity to receive representations; but sensation is not separable from those *a priori* conditions. Space is the form of outer sense, of objects in the external world, whereas time is the form of both outer and inner sense—our inner experience necessarily only involves succession in time. Space and time are the *a priori* forms of our sensibility as a whole. These pure forms of our intuitions are analogous to filters on a camera: the only images formed are ones that have passed through or been subject to the filters. The pure forms of intuition are not empirical: they are not derived *from* experience, rather they are the necessary form of all experience. Nor are space and time concepts, for there can be no object (like a table) corresponding to space and time in general. Kant

further holds that the pure intuition of space is presupposed by geometry, and that of time is presupposed by arithmetic.

In addition to this, *knowledge*, as opposed to the mere having of experiences, involves the use of the basic concepts or categories of the faculty of the understanding. The knowledge that what we see is a table involves having and applying the concept of a table by a judgement of the understanding, not just seeing something in space and time. Furthermore our understanding *necessarily* operates with certain basic concepts or categories. Knowledge is possible through the conjunction of actual intuitions with the necessary categories of the faculty of understanding. The senses alone are literally thoughtless; the understanding alone is contentless.

A summary of the nature of intuitions, and the relation between them and concepts of the understanding producing knowledge, can be given in the following diagram.



There is a sharp distinction between the intellectual and sensory elements in human knowledge. The mind is active in understanding nature, not a passive receptacle waiting to be filled by experiences. Transcendental philosophy does not give us particular scientific knowledge of the world we experience; but the transcendental deduction shows how we can know the necessary *a priori* elements

presupposed by such scientific knowledge of the world as experienced. For example, we cannot know *a priori* that *A* is the cause of *B*—that is a matter for scientific empirical investigation; but it can be known *a priori* that *B* has some cause—that much can be proved by transcendental philosophy.

Kant was well aware of the distinction, said to be confused in the work of some earlier philosophers, between the origin (*quid facti*) of something, and its justification (*quid juris*). The revealing of the origin or genesis of a truth or belief has to be distinguished from whether the truth or belief can be known *a priori* or *a posteriori*. The origin concerns facts about psychology; the question of whether a proposition is *a priori* or *a posteriori* concerns what logical type the proposition is. Propositions that can be shown to follow deductively from certain logically necessary premises can be known independently of the evidence of experience, since their denial would imply a logical contradiction; but some truths can be known only by consulting the evidence of experience, even if the belief in the truth happens to be psychologically innate. I may have been born with the belief, which is true, that “There are lions in Africa”; but the conditions for the belief being true depend on facts about Africa; knowledge of those facts, and hence knowledge of the truth of the proposition describing those facts, can be justified only by experience of Africa; it could not be proved *a priori* by deductive reasoning or *a priori* by merely understanding the meaning of the terms in the proposition that expresses the belief. To show that something is psychologically *a priori* does not show it to be *a priori* valid or true, still less that its truth is knowable *a priori*.

Kant was not engaged in speculative empirical psychology. If Kant can justify the necessity of the application of the forms of space and time, and the categories, to the world, he will have achieved a great deal. In the first case we have, for example, justified, and explained, applied mathematics; in the second we have justified concepts essential to science, for example, substance, causality, plurality, unity and the like.

Running through Kant’s philosophy is a distinction between form and content. The form of experience is knowable *a priori*; the content or filling is given to us and is knowable *a posteriori*; but the two elements are not simply separable. The form of our intuitions is space and time, the forms of our understanding or thought are the categories. In actual intuitions, sensations and space and time are not separable; in actual knowledge, intuitions and categories are not separable. This idea is essential to understanding Kant’s transcendental idealism: his notion of objectivity is designed to counter empirical idealism, which is the position that our knowledge is only subjectively valid concerning the content of our own minds.

The “schemata”, which are kinds of restricting frameworks, are

required to give rules for applying the categories, for the concepts of the understanding in their pure form are never met in intuitions; we must take the pure concepts and form schematisms by which particular intuitions can be identified as falling under pure concepts. If we take the example of the category of substance as that which is always a subject of predication and is never predicated of another subject, the schema of substance is that which is permanent in time while other things change. The schema of necessity is the existence of an object at all times. The schema of causality is the succession of real things according to a rule. Time is presupposed *a priori* in our experiencing things existing simultaneously or successively; and it is indeed temporal existence that is the primary condition to which schemata of the *a priori* imagination must conform. It is the schema which ensures that the categories are applied only to objects of possible experience; the understanding is effectively limited to experience (intuitions of our sensibility) by requiring that the application of the pure concepts is through schemata which involve the *a priori* pure form of inner intuition (time) and outer intuition (space); that is, the categories are limited to objects in time and space. Thus the categories become more than pure or formal logical truths, but come to have objects to which they apply; they come to tell us something *a priori* about the objects of possible experience, that is, possible intuitions. Through the methodological adoption of the mechanism of schemata, reason does not attempt to describe a world beyond or behind all possible experience; in this case it is not a world which is as a matter of fact out of reach of all experience from which we exclude ourselves, but rather a world which is necessarily out of reach of all possible experience. What is denied is "transcendent" knowledge: knowledge of things-in-themselves or, in Kant's terminology, noumena beyond the conditions for all experiences. For example, it can be said to be possible to experience atoms, although in fact they are too small to see (at least with the naked eye); whereas it is impossible that we should experience timelessness or eternity, since all experiences are in time as they involve succession; nor is it possible to conceive of a spaceless world.

We can see the categories as the highest point of a hierarchy of classificatory and ordering concepts. We use the concept "tree", which falls under the concept "plant", which is an "object", which is subsumed under "substance", something that is separable and can remain the same while undergoing certain sorts of changes. We can conceive of a world as experienced to which the lower and more particular concepts do not apply—a world without trees, in which the concept "tree" is not applied in our judgements—but we cannot conceive of a world to which the concepts of something that can endure through change, universal causality, plurality and unity do not apply. The same applies to the other twelve in the table of categories.

	I	
	Quantity	
	Unity	
	Plurality	
	Totality	
II		III
Quality		Relation
Reality		Substance and accident
Negation		Cause and effect
Limitation		Reciprocity
	IV	
	Modality	
	Possibility and impossibility	
	Existence and non-existence	
	Necessity and contingency	

These are the categories with which we must think if we think about the world at all, and they must therefore be presupposed in, apply to, any way the world can appear to us and be involved in all judgement and knowledge.

In the metaphysical deduction of categories, Kant tries to demonstrate how the categories arise from general logic—from different kinds of logical judgements. However, Kant's exposition is unusually terse. The judgement "Some S is P" ("Some cows are black") involves concepts; it involves the concept of *plurality*, since it involves two terms, it involves the concept of *reality*, since it states something is.

Perhaps of greater importance to the modern reader is the transcendental deduction, for here we have an argument that attempts to justify the application of categories as such; that there are concepts we necessarily have to apply to experience, whatever these concepts specifically turn out to be. The sense of "deduction" in the transcendental deduction is more akin to a defence in law than an argument in formal logic.

The transcendental deduction runs as follows. The aim of the transcendental deduction is to show not only that there are categories or concepts we necessarily apply to our experience, but also that that experience must be such that in applying the categories we can be said to be making objective judgements, or judgements about objects. The absolutely minimum condition for experiences which are *something to me* is that the experiences are subject to a synthesis such that they are all part of one consciousness. To say that experiences are thus united is equivalent to the condition of apperception, that is, the experiences are possible objects of self-consciousness; it must be possible for the "I think" to accompany all my representations. The "I" here is not empirical self-consciousness; sometimes I reflect, and sometimes I do

not; it is the transcendental unity of apperception: the unity given by the mere possibility of my being self-conscious of whatever experiences I have. For this apperception to make sense it is necessary that I am aware of something which is not-self, objects which have a unity and independence of their own, distinct from my self; if they were not thus independent, I would not be engaged in an act of self-consciousness at all. The items on which I reflect in self-consciousness, that is, the items of my consciousness, are not-self and are therefore objects; they have objectivity. Now to reflect at all is to apply concepts; to say, for example, "x now", "there are more xs than ys", "x is different from y", "x again", "y has got bigger"; in reflection concepts must be applied, so what presents itself could not be a totally disordered stream of sensation, each item utterly unrelated to any other. In the final step, having shown we necessarily apply concepts, Kant, due to his faith in his metaphysical deduction, thinks he has shown that it must be just those concepts or categories deduced in the metaphysical deduction that we apply.

To sum up: consciousness is a uniting of intuitions, the condition for this is possible self-consciousness; the condition for self-consciousness is awareness of objects, or objective experiences (experiences under categories); the objects of consciousness on which we reflect in self-consciousness are therefore subject to concepts (are objects having order intrinsic to them); and if we must apply concepts, the categories revealed in the metaphysical deduction must be the concepts we apply.

Kant equivocates about the nature of objects, items of which we can claim to be able to make judgements independent of the particular state of the subject. Whether the objectivity granted by the categories as the necessary universally valid conditions for all experience is enough to give us everything we expect of an object, and an objective world, is open to dispute. But the transcendental deduction attempts to justify the application of the categories by all rational consciousnesses, not just the human mind. There cannot be forms of understanding quite different from our own. Kant does allow that there could be forms of sensible intuition other than our own human forms.

Hume correctly thought we could not derive an abiding self from the flux of perceptions open to introspection; but Kant argues that the ability to introspect at all assumes a self or subject which has the experience, for we say, "This is my experience"; it must be possible for the "I think" to accompany all my representations. But I can think only according to the categories; so there can be no experience such that it is not subject in my judgement to the categories, since then there would be experiences of mine which could not be accompanied by "I think", which is impossible. The awareness of self derives from the awareness of our power to unite representations in one consciousness.

This creates for Kant the possibility of objective knowledge of the world; knowledge must include experience, and we necessarily have to apply the categories which give the form of that experience.

Whereas Kant's argument may have justified the application of necessary conditions for experience—some set of categories or other—it is not clear that he has justified the application of all and only those categories he lists in particular; that would follow only if we accepted the metaphysical deduction.

This has led some to update the categories but maintain their necessity; it has led still others to update them but to abandon their necessity. The second of these positions seems to abandon the point of Kant's transcendental idealism, for then the categories are neither universal (for they apply only to human cognition) nor necessary (not transcendently necessary but psychological facts). On the other hand, the first position has great difficulty generating categories which at once can be shown to apply necessarily to any comprehensible world, while at the same time avoiding the triviality of being entirely vacuous and non-specific.

Interpretations of Kant's transcendental idealism vary. One view asserts that we have obtained objective knowledge because the categories have been demonstrated to have universal intersubjectivity. Another view suggests that Kant has to show that there is a world of objects existing independent of us in some further sense than the world we experience and know, necessarily conforming to the categories which are not thereby merely arbitrary and subjective. But this destroys Kant's position by asking him to accomplish the impossible. We cannot possibly know that objects in themselves, distinct from how they are experienced or appear to us, are organized according to the categories, but we can know that objects as they appear or the world-as-experienced must be organized according to the categories, since the way objects appear partly depends on ourselves and we must apply the categories in thinking about what we experience. The world, or nature, just is the sum of possible experiences; the world of phenomena. Noumena, or things-in-themselves (*Dinge-an-sich*), are not objects of experience; they stand proxy for a world beyond appearances that is unknowable; this realm is nothing to do with the world as studied by science. Noumenon is not, it must be emphasized, the atomic world, or anything where our lack of actual experience of it is purely a matter of accidental contingent fact. The atomic world exists straightforwardly (or so it seemed in Kant's day) in space and time, even if the laws governing its behaviour are discovered indirectly by its effects; our inability to observe atoms directly is an empirical, not a transcendental, limit to our experience. The appearance/reality distinction is not between phenomena/ noumena, but between the variant/invariant features of our experience. To suggest that we can still look around the edge of all

our experiences, dropping our form of cognition, to a world untainted by that form, to see if the categories actually apply, is to attempt what Kant denies is possible, and to abandon precisely the ground from whence the objectivity of the categories arises. The categories which we bring to experience cannot be abandoned, for they are present whenever we have an intelligence capable of self-conscious thought.

Kant says his position supports empirical realism and refutes idealism. Whatever we may think of Kant's arguments, he cannot be defending empirical realism in the form of knowledge of objects devoid of our form of understanding; to think otherwise is to miss the point. If we tried to apply Kant's views to objects totally independent of our, and all intelligent, modes of understanding, Kant could never have hoped to justify the necessary application of categories; there would always be an unbridgeable gap between the way we think and what we think about; we would never be able to show the categories applied to reality in this sense, rather than merely indicating how we have to think about the world. If any conception of reality is inseparable from mind, then there is a possibility of explaining why our basic intellectual structures—causality, substance, plurality, and the like—must actually apply. The point is that as far as we are concerned, transcendental idealism delivers all that a bald empirical realism supposes to be the case; these two positions are in that sense equivalent and indistinguishable. A logically or transcendently inescapable perspective is equivalent to an objective view. Universal objectively valid knowledge, invariant with, and not requiring qualifying reference to, the state of the subject, is squared with the argument that there cannot be a perspectiveless world-view of things-in-themselves through the establishment of the categories and forms of intuition as transcendently necessary and objective for all possible appearances in being invariant with the experiencing subject. There is then no perspectiveless position from which the rational perspective itself can be checked; if the perspective is thereby universal it is also necessary and objective and independent of the individual subjective perspective.

This is not the only interpretation of Kant's position, and Kant himself was not entirely consistent or clear; he plainly felt uneasy about it. Kant sometimes speaks as if noumena are the unknowable causes of our experiences.

Kant attacks in the Dialectic the possibility of knowledge transcending experience and its *a priori* form or conditions to attempt to gain knowledge of unconditioned noumena, a perspectiveless view of things-in-themselves. Kant is setting the necessary presupposition of all human knowledge and so marking the bounds of legitimate inquiry. The Dialectic is the logic of illusion. That is not to say that we cannot think beyond the bounds of possible experience; we can form concepts—for example of substance—to think about that which exists

beyond our possible intuitions, and so outside space and time; but knowledge is not possible.

Noumena are unknowable; we can speak of noumena only negatively: we can say what they are *not* as compared to phenomena that we can experience, since we can say that none of our concepts can be positively applied to characterize noumenon. It is indeed unclear if we can legitimately talk of either noumenon in the singular or noumena in the plural, since the first involves the category of unity and the second that of plurality. Whatever is the case, noumenon, or the thing-in-itself, is reality in the sense of being independent of all conceptual determinations which apply necessarily to the world as experienced; and, since all knowledge involves applying concepts, things-in-themselves are unknowable.

Illusory metaphysics which aims at knowledge has three main subjects: God, and proofs for the existence of God; freedom, which connects with cosmology; immortality, which connects with the soul. Metaphysical speculation which aims at knowledge of truths concerning these subjects has been endless, fruitless and contradictory. In contrast to physical science, disputes seem undecidable. As Kant says, it has involved "deluding the adventurous seafarer ever anew with empty hopes, and engaging him in enterprises which he can never abandon and yet is unable to carry to completion". Kant wants to show why this is so, and put an end to it. This is the overall aim of Kant's "critical philosophy".

Kant sets about this demonstration in the Antinomies. The strategy is, after taking some matter about which we illegitimately aim to know, to present a pair of equally logically compelling arguments from which are derived a thesis and antithesis which are mutually exclusive and collectively exhaustive alternatives. The conclusions cannot both be true, but we have no way of knowing which is true and which false. The proof of the thesis and antithesis is by *reductio ad absurdum*: showing that denying an assertion leads to an impossibility, thus demonstrating the truth of the assertion. Kant presents four Antinomies: first, the finitude or infinitude in space and time of the universe; secondly, the finite or infinite divisibility of substance; thirdly, whether there is freedom or no freedom; fourthly, whether there exists an absolutely necessary being or not. These matters are undecidable by human reason, since we are presented with equally convincing conclusions which are mutually contradictory. However, to agree that the Antinomies show this, we would have to accept the arguments for each thesis and antithesis in each Antinomy as equally valid; unfortunately their quality is variable.

Hegel (1770–1831) was to suggest that the opposing conclusions of Kant's Antinomies indicate not the limits of human reason, but the need for a synthesis which somehow encompasses the conflicting conclusions as to the nature of reality.

Arguments for the existence of God are classified in three ways: physico-theological, cosmological, ontological. The physico-theological is basically the argument from design, whereby, if an orderly clock needs a clockmaker, the world surely needs a worldmaker. Hume had attacked this argument on the grounds that if the clock/world analogy was weak, then the world might not need a maker; if the analogy was strong, then the worldmaker was no better than a clockmaker, and need not be a God at all. The cosmological argument harks back to the ancient unmoved-mover argument of a first cause required to start the universe off; this is already implicitly undermined in the Antinomies. The most significant attack is upon the ontological argument. Here God's existence is said to be deducible from the concept of God; God is perfection, it is more perfect to exist than not to exist, therefore the perfect being must exist. Kant's refutation of this proof rests on arguing that "existence" is not a descriptive predicate adding anything to the meaning or concept of a subject, so that to say something exists does not therefore attribute an additional property to a subject at all; rather it merely says that there is something to which the concept of the subject applies. We do not add an additional property, after we have listed all the attributes of Kant, by saying Kant exists; rather it is to say that all the properties of Kant—shortness, thin body, philosopher, etc.—actually have an instance.

Kant was concerned that he had, in a sense, done his job of providing necessary metaphysical foundations too well; especially with reference to the universally valid application of causality to phenomena, it seemed as if there was no place left for human freedom. Kant replies through an analysis of the self. Although the world of phenomena may be determined by the causal laws of physics and transcendental concepts, the noumenal world beyond experience is not. Kant's answer is to posit a noumenal-self, or transcendental-self, which is "outside" the phenomenal world; man viewed as noumenon can therefore act freely according to the moral law. The transcendental-self is the only transcendental object we have access to; here our perspective and a perspectiveless view become one and the same; the distinction between appearance and reality can be eliminated. This explanation of freedom leaves too many questions in obscurity to be satisfactory; moreover, because the moral law governs the operation of the noumenal-self, it fails to explain how we could ever act wrongly. If it is maintained that the operation of the noumenal-self originates totally spontaneously, then it amounts to nothing more than a reassertion of belief in freewill. In any event Kant's call upon the transcendental world should, on his own account, be illegitimate, as this world is unknowable, and its causal interaction with the phenomenal world impossible, since the concept of causality cannot apply to it.

Kant does leave some positive function to the ideas of

unconditioned reason; they can be regulative of our inquiries, even if concrete knowledge of truths cannot directly be derived from them. If we treat the ideas of unconditioned reason as unobtainable aims, they may act as injunctions. For example, the idea of determining if the world has a beginning in time is not something we can settle by pure reason, nor could any empirical inquiry determine the answer; but the question of the universe's temporal origin requires us to keep searching for ever greater understanding of the universe's origin.

We can summarize the philosophy of Kant in the following way. Kant starts from the problem of justifying the objectivity and necessity of the form of intuitions and the concepts we apply to the world. Their necessity and objectivity seem unjustifiable by the raw sensations of experience alone or because their rejection would involve logical contradiction. The world for us can be nothing but the sum total of possible appearances, and the form given to those appearances—applied to the raw sensations—is the product of our minds; appearances, but not things-in-themselves, have to conform to the form given to them by our understanding; these forms are objective and necessary because they are that to which all appearances must conform if there are awareness and judgements concerning those appearances; these forms are universally valid for all rational beings. Thus they are objective because they apply to all worlds conceivable to us, and to rational beings in general, and so are independent of the subjective contributions of any individual minds. The world as noumenon is the world considered as other than how it can ever appear to us; such a world beyond all possible appearances is unknowable; it is a world in which the *a priori* form produced by our intellect is not valid, since it is the world as it is independent of all appearances, beyond possible experience. The function of philosophy is not to provide us with knowledge of the nature of reality as a whole or in itself—how the world might be beyond how it can possibly appear to us—but with knowledge of the *a priori* form or structure of those appearances themselves. Nor can philosophy lay down *a priori* the scientific laws of nature; but it can justify the presuppositions that the scientific empirical inquiry into the laws of nature involves. Philosophy studies the only thing it can: the necessary and universal *a priori* form of the world as it appears to us; the *a priori* forms are necessary and objective because they are how any rational minds must think; the forms are therefore applicable to any conceivable world, that is, to all that is a possible appearance to us.