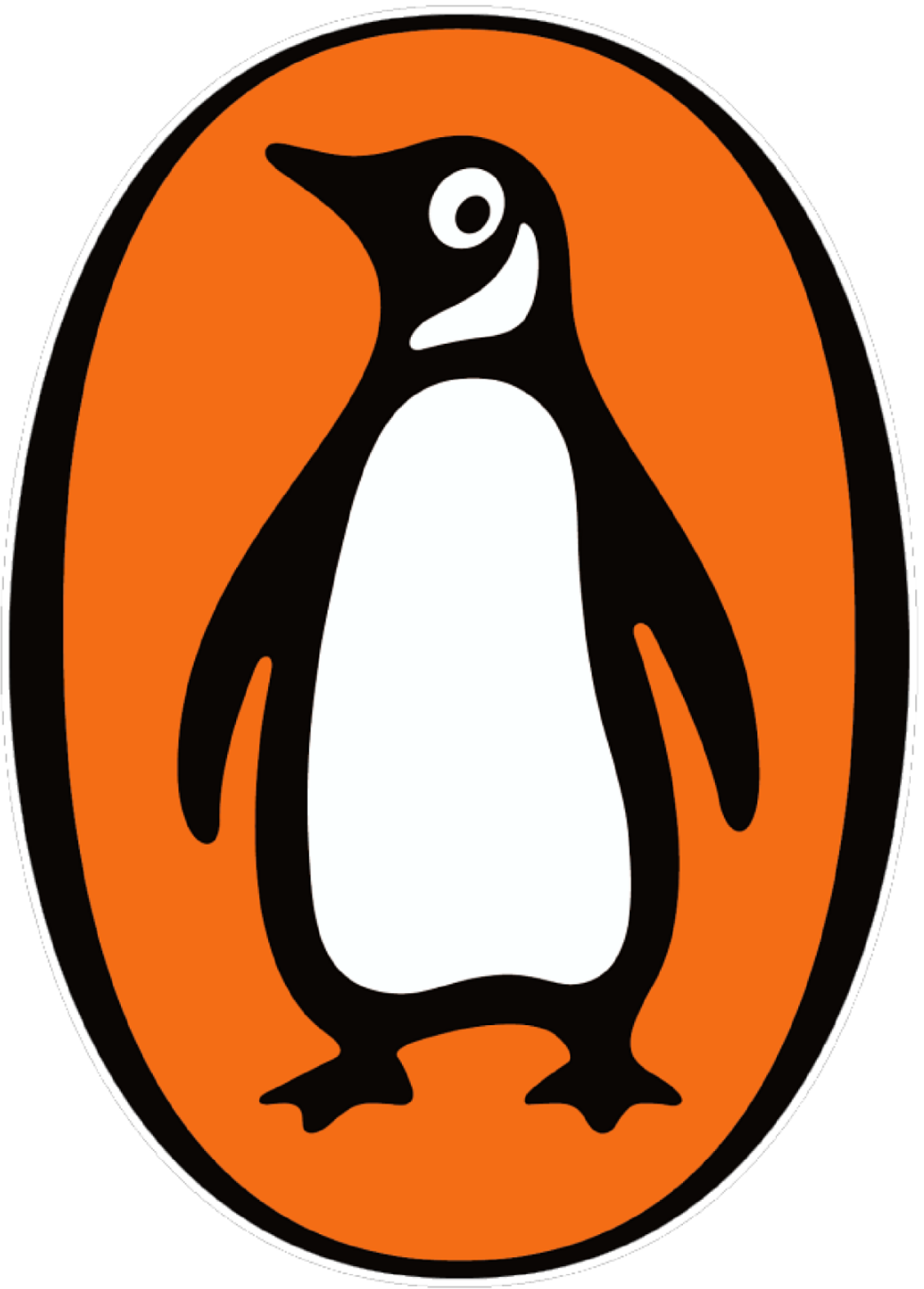

Contents

About the Author

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Preface

This survey of philosophy's history is intended for the general interested reader and for those embarking on the study of philosophy. There are fine scholarly treatments of particular periods in the history of philosophy for those who wish to take their enquiries further, and I hope that some readers will be motivated by the following pages to turn to them, and above all to the primary literature of philosophy itself. Not all the classics of philosophy have an impenetrable veil of technicality and jargon draped over them, as is the case with too much contemporary philosophical writing, the result of the relatively recent professionalization of the subject. It was once taken for granted that educated people would be interested in philosophical ideas; the likes of Descartes, David Hume and John Stuart Mill accordingly wrote for everyone and not just for trained votaries of a profession.

To tell the story of philosophy is to offer an invitation and an entrance, much as Bertrand Russell did in his *History of Western Philosophy*, a book that achieved near-classic status for the sparkling clarity of its prose and its wit – though not always for its accuracy, adequacy or impartiality. Nevertheless that was a book I relished as a schoolboy, along with its nineteenth-century predecessor, G. H. Lewes' *A Biographical History of Philosophy.* It is a testament to both that, after the long intervals that have elapsed since they were written, one can enjoy them still, despite knowing that the explosion in more recent scholarship has added much to our understanding of philosophy's history, and that philosophy's history itself has grown longer and richer since their time. The ambition in what follows is to iterate their achievement for our own day, and to supplement the endeavour by looking not only (though mainly) at the Western tradition but beyond it to the other great traditions of thought – the Indian, Chinese and Arabic–Persian – even if only in outline, to indicate comparisons.

An historical overview obviously does not pretend to offer a complete treatment of the thinkers and themes it discusses; for this one must go to primary sources and scholarly examinations of them. But not all readers intend to carry the study of philosophy further, and for their purposes it is important that they should be given a reliable account of the thinkers and debates constituting philosophy's great story. That aim is fully in view here.

My method, accordingly, is to give as clear and concise an account as I can of philosophy's main figures and ideas. Notes are kept to a minimum, and almost all are asides or amplifications, not textual references; there are bibliographies citing the main texts referred to, and works which will take readers further.

It is an almost irresistible temptation to discuss and debate, criticize and defend, when writing of philosophical ideas, for that is the very essence of philosophy. But in this kind of book that temptation has to be restrained to a considerable degree, not just because yielding to it would quadruple the book's length, but because doing so is not the main point. At times, though, it is necessary to show *why* what followed from a given philosopher's ideas was influential or prompted disagreement, so an evaluative element is not wholly absent.

Acknowledgements

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Introduction

Philosophy's history, as today's students and teachers of philosophy see it, is a retrospective construct. It is chosen from the wider stream of the history of ideas in order to provide today's philosophical concerns with their antecedents. This fact has to be noted if only to avoid confusion about the words 'philosophy' and 'philosopher' themselves. For almost all of its history 'philosophy' had the general meaning of 'rational enquiry', though from the beginning of modern times in the Renaissance until the nineteenth century it more particularly meant what we now call 'science', though a 'philosopher' was still someone who investigated anything and everything. Thus it is that King Lear says to Edgar, 'First let me talk with this philosopher: What is the cause of thunder?' On William Hazlitt's tombstone, engraved in 1830, the famous essayist is described as 'the first (unanswered) Metaphysician of the age', because at that time what we now call 'philosophy' was called 'metaphysics' to distinguish it from what we now call 'science'. This distinction was often marked by the labels 'moral philosophy' to mean what we now call 'philosophy', and 'natural philosophy' to mean what we now call 'science'.

The word 'scientist' was coined as recently as 1833, giving the related word 'science' the sense it now familiarly has. After that date the words 'philosophy' and 'science' took on their current meanings, as the sciences diverged more and more from general enquiry by their increasing specialism and technicality.

In contemporary philosophy the principal areas of enquiry are epistemology, metaphysics, logic, ethics, aesthetics, the philosophy of mind, the philosophy of language, political philosophy, the history of debates in these areas of enquiry, and philosophical examination of the assumptions, methods and claims of other fields of enquiry in science and social science. Most of this is, and certainly the first three are, the staple of a study of philosophy at universities in the Anglophone world and in Europe today.

And correlatively, these are the fields of enquiry that determine which strands in the general history of ideas are selected as today's 'history of philosophy', thus leaving aside the history of technology, astronomy, biology and medicine from antiquity onwards, the history of physics and chemistry since the seventeenth century, and the rise of the social sciences as defined disciplines since the eighteenth century.

To see what determines which strands in the history of ideas to fillet out as 'the history of philosophy' we therefore need to look backwards through the lens of the various branches of contemporary philosophy as listed above, and this requires a preliminary understanding of what these branches are.

Epistemology or 'theory of knowledge' is enquiry into the nature of knowledge and how it is acquired. It investigates the distinctions between knowledge, belief and opinion, seeks to ascertain the conditions under which a claim to know something is justified, and examines and offers responses to sceptical challenges to knowledge.

Metaphysics is enquiry into the nature of reality and existence. What exists, and what is its nature? What is existence? What are the most fundamental kinds of being? Are

there different kinds of existence or existing thing? Do abstract entities outside space and time, such as numbers and universals, exist in addition to concrete things in space and time such as trees and stones? Do supernatural entities such as gods exist in addition to the natural realm? Is reality one thing or many things? If humans are wholly part of the natural causal order of the universe, can there be such a thing as free will?

Metaphysics and epistemology are central to philosophy as a whole; they are, as it were, the physics and chemistry of philosophy; understanding the problems and questions in these two enquiries is basic to discussion in all other areas of philosophy.

Logic – the science of valid and sound reasoning – is the general instrument of philosophy, as mathematics is in science. In the Appendix I give a sketch of the basic ideas of logic and explain its key terms.

Ethics, as a subject in the philosophy curriculum, is enquiry into the concepts and theories of what is good, of right and wrong, of moral choice and action. The phrase 'as a subject in the philosophy curriculum' is employed here because the word 'ethics' has multiple applications. Even when used as the label of an area of philosophy it serves to denote two separable matters: examination of ethical concepts and reasoning – this is more precisely described as 'metaethics' – and examination of 'normative' moralities which seek to tell us how to live and act. Normative morality is distinguished from the more theoretical metaethical enquiry by describing normative morality as a 'first order' endeavour and metaethics as a 'second order' endeavour. By its nature philosophy is a second-order enquiry, so 'ethics' in the context of philosophical study standardly means metaethics.

But the word 'ethics' also, though relatedly, denotes the outlook and attitudes of individuals or organizations regarding their values, how they act and how they see themselves. This is a familiar and good use of the term; and – interestingly – reflection on this use shows that the words 'ethics' and 'morals' do not mean the same. This is easier to grasp when we note the etymologies of the terms: 'ethics' comes from the Greek *ethos* meaning 'character', whereas 'morals' derives from a coining by Cicero from the Latin *mos*, *moris* (plural *mores*) which means 'custom' and even 'etiquette'. Morality, accordingly, is about our actions, duties and obligations, whereas ethics is about 'what sort of person one is', and although the two are obviously connected, they are equally obviously distinct.

This distinction naturally appears in the arenas of metaethical and normative discussion too. In their identification of the locus of value, some metaethical theories focus on the character of the agent, others on the consequences of actions, others again on whether an action conforms to a duty. When it is the character of an agent that matters, we are discussing ethics in the sense of *ethos* just described; when it is the consequence of actions or conformity with duty that matters, it is the narrower focus of morality which is in view.

Aesthetics is enquiry into art and beauty. What is art? Is beauty an objective property of things natural or man-made, or is it subjective, existing in the eye of the beholder only? Can something be aesthetically valuable whether or not it is beautiful and whether or not it is a work of art? Are the aesthetic values of natural things (a landscape, a sunset, a face) different from those we attribute to artefacts (a painting, a poem, a piece of music)?

Philosophy of mind is the enquiry into the nature of mental phenomena and consciousness. It was once an integral part of metaphysics because the latter, in enquiring into the nature of reality, has to consider whether reality is only material, or in addition has non-material aspects such as mind, or perhaps is only mental as the

'idealist' philosophers argue. But as consensus has grown around the view that reality is fundamentally and exclusively material, and that mental phenomena are the products of the material activity of the brain, understanding those phenomena and in particular the nature of consciousness has become a topic of intense interest.

Philosophy of language is enquiry into how we attach meaning to sounds and marks in a way that enables communication and embodies thought, indeed perhaps makes thought above a certain rudimentary level possible in the first place. What is the unit of semantic meaning – a word, a sentence, a discourse? What is 'meaning' itself? What do we know – or know how to do – when we 'know the meaning' of expressions in a language? Is there such a thing as *a language* such as English, or are there as many idiolects of English as there are speakers of those idiolects, thus making *a language* in fact a collection of not completely overlapping idiolects? How do we interpret and understand the language-use of others? What are the epistemological and metaphysical implications of our understanding of language, meaning and language-use?

For good reasons the philosophies of mind and language have become conjoined into a single overall enquiry in more recent academic philosophy, as the titles of books and university courses ubiquitously attest.

Political philosophy is enquiry into the principles of social and political organization and their justification. It asks, What is the best way to organize and run a society? What legitimates forms of government? On what grounds do claims to authority in the state or a society rest? What are the advantages and disadvantages of democracy, communism, monarchy and other forms of political arrangement?

The *history of philosophy* as it is viewed backwards through the lens of the above enquiries is an essential part of philosophy itself, because all these enquiries have evolved over time as – so to speak – a great conversation among thinkers living in different centuries in different circumstances but nevertheless absorbed in the same fundamental questions; and therefore knowing the 'case law' of these debates is crucial to understanding them. This prevents us from unnecessarily reinventing the wheel over and over again, helps us to avoid mistakes and to recognize pitfalls, allows us to profit from our predecessors' endeavours and insights, and gives us materials to use in trying to understand the subject matter at issue, and to frame the right questions to ask about them.[fn1]

Philosophical examination of the assumptions, methods and claims of other fields of enquiry is what is meant by such labels as 'philosophy of science', 'philosophy of history', 'philosophy of psychology' and the like. Every enquiry rests on assumptions and employs methodologies, and self-awareness about these is necessary. Philosophical questions about science, for example, are asked by scientists themselves and not only by philosophers; philosophical questions about the study of history likewise are raised by historians in discussing their methods and aims. Consider each in turn more particularly, as follows.

Should science be understood in realist or in instrumentalist terms – that is, are the entities referred to by technical terms in science really existing things, or are they useful constructs that help to organize understanding of the phenomena being studied? Is scientific reasoning deductive or inductive? Is there such a thing as scientific *knowledge* or, on the understanding that all science is open to refutation by further evidence, should it be understood as a system of powerfully evidenced theories which are nevertheless intrinsically defeasible?

As regards history: if there is no evidence one way or the other for a claim about something that happened in the past, is the claim nevertheless definitely either true or

false, or is it neither? History is written in the present on the basis of evidence – diaries, letters, archaeological remains – that has survived into the present (or so we judge): it is partial and fragmentary, and many of the past's traces are lost; is there therefore such a thing as *knowledge* of the past at all, or is there only interpretative reconstruction at best – and perhaps, too often, just surmise?

Reflection on the kinds of enquiries, and kinds of questions those enquiries prompt, shows that philosophy is the attempt to make sense of things, to achieve understanding and perspective, in relation to those many areas of life and thought where doubt, difficulty, obscurity and ignorance prevail – which is to say: on the frontiers of all our endeavours. I describe the role of philosophy to my students as follows: we humans occupy a patch of light in a great darkness of ignorance. Each of the special disciplines has its station on an arc of the circumference of that patch of light, straining to see outwards into the shadows to descry shapes, and thereby to push the horizon of light a little further outwards. Philosophy patrols the whole circumference, making special efforts on those arcs where there is as yet no special discipline, trying to formulate the right questions to ask in order that there might be a chance of formulating answers.

This task – asking the right questions – is indeed crucial. Until the sixteenth and seventeenth centuries, philosophers did not often enough ask the right questions in the right way about nature; when they did, the natural sciences were thereby born, developing into magnificent and powerful fields of enquiry which brought the modern world into existence. Philosophy thus gave birth to science in those centuries; in the eighteenth century it gave birth to psychology, in the nineteenth century to sociology and empirical linguistics, in the twentieth century it played important roles in the development of artificial intelligence and cognitive science. Its contributions to aspects of neuroscience and neuropsychology continue.

But the core of questions in epistemology, metaphysics, ethics, political philosophy, the 'philosophy of' pursuits, and the rest, remain; they are perennial and perennially urgent questions, because efforts to answer them are part of the great adventure of humanity's effort to understand itself and its place in the universe. Some of those questions seem unanswerable – though to act on the thought that they are so is to give up far too soon. Moreover, as Paul Valéry said, *Une difficulté est une lumière. Une difficulté insurmontable est un soleil*: 'A difficulty is a light. An insurmountable difficulty is a sun.' Wonderful saying! for it teaches us that the effort to solve even the seemingly unsolvable teaches us an enormous amount – as the history of philosophy attests.

What follows, then, is the history of philosophy in today's meaning of the word 'philosophy', showing how the subject matter of today's philosophical enquiries began and evolved. It is mainly the history of Western philosophy that I describe in these pages, but I give overviews of Indian, Chinese and Arabic–Persian philosophy (and a consideration of philosophy in Africa) to note some connections and differences among the great traditions of thought: see the opening pages of Part V. In all cases I have of necessity focused on the main figures and ideas, and in the case of the non-Western traditions I write as a spectator observing from the other side of a linguistic barrier, having extremely little access to Sanskrit, Pali and ancient Chinese, and none to Arabic.

A difference between this and other histories of philosophy is that this one does not detour into what most others give, namely, accounts of the *theologies* of Augustine, some of the Church Fathers of early Christianity and the 'Schoolmen' of later medieval times such as Aquinas and Duns Scotus. This is a history of philosophy, not of theology and religion. An oddity of histories of philosophy which include theologians among the

philosophers is that there is no better reason to include Christian theologians while excluding Jewish or Islamic ones; and no better reason to include theology in a history of philosophy than to include a history of science (indeed, there is rather more reason to include this latter). A fundamental difference between philosophy and theology is that philosophy is the enterprise of trying to make sense of ourselves and our world in a way which asks what we should think and why, whereas theology is the enterprise of exploring and expounding ideas about a certain kind of thing or things taken to exist actually or possibly, namely, a god or gods – a being or beings supposed to be different in significant and consequential ways from ourselves. As I write in dealing with this point in connection with Arabic–Persian philosophy in Part V, 'if the starting point for reflection is acceptance of a religious doctrine, then the reflection that follows is theology, or theodicy, or exegesis, or casuistry, or apologetics, or hermeneutics, but it is not philosophy': and that is the principle of demarcation I apply throughout.

A way of dramatizing the point more polemically is to say that philosophy is to theology what agriculture is to gardening: it is a very much bigger, broader and more varied enterprise than the particular, localized and focused one of 'talking or theorizing about a god' (which is what *theo-logos* means). Of course in philosophy the question whether supernatural entities or agencies exist, and what difference would follow for our picture of the world and ourselves if one or more did so, from time to time arises; and there are philosophers who, drawing on a conception of deity from 'natural theology' (that is, some general considerations about a supernatural mind or agency), use it to guarantee the possibility of knowledge (as Descartes did) or as a basis for existence (as Berkeley and not a few others did). These views are discussed in the appropriate places in the following pages. But the tangled efforts to make sense of something like deity as traditional religions wish to have it understood – omnipotent, eternal, omniscient being or beings, and so forth – is not except tangentially a fruitful part of the story of philosophy, and is left to its own historians therefore.

Part I

ANCIENT PHILOSOPHY

Philosophy before Plato

There is a wall standing between us and the world of antiquity: the period of the decline and fall of the Roman Empire and the rise to dominance of Christianity. Edward Gibbon connected the two phenomena, blaming the former on the latter. He is in significant part right. Remember that in 313 CE the Emperor Constantine gave Christianity legal status and protection by the Edict of Milan, and not long afterwards, in 380 CE, the Emperor Theodosius I decreed by the Edict of Thessalonica that Christianity was to be the official religion of the Empire, outlawing others. The change brought rapid results. From the fourth century of the Common Era (CE, formerly cited as AD) onwards a vast amount of the literature and material culture of antiquity was lost, a great deal of it purposefully destroyed. Christian zealots smashed statues and temples, defaced paintings and burned 'pagan' books, in an orgy of effacement of previous culture that lasted for several centuries. It has been estimated that as much as 90 per cent of the literature of antiquity perished in the onslaught. The Christians took the fallen stones of temples to build their churches, and over-wrote the manuscripts of the philosophers and poets with their scripture texts. It is hard to comprehend, still less to forgive, the immense loss of literature, philosophy, history and general culture this represented. Moreover, at the time Christianity existed in a number of mutually hostile and competing versions, and the effort – eventually successful – to achieve a degree of consensus on a 'right' version required treating the others as heresies and aberrations requiring suppression, including violent suppression.

In its assault on the past Christianity had help from others with a similar lack of interest in high classical civilization: Huns, Goths, Visigoths and others – the 'barbarians' – whose migrations and invasions into the ever-weakening Roman Empire hastened its collapse.[fn1] The shrinking of mental and cultural life was both a cause and an effect of diminishing education; fewer books were written and published, prohibitions were imposed on what could be read and discussed, and the predictable consequences of such circumstances followed in the form of increasing ignorance and narrowness. Christianity congratulates itself on the fact that the preservation of fragments of classical literature which managed to scrape through this period of appalling destruction was the achievement of monks, in later centuries, copying some of the manuscripts that survived; and although this was a merely partial, belated and inadequate response to the wanton zealotry of the earlier faithful, one must be grateful even for that.

As one would expect, only those texts regarded as most significant and outstanding, by individuals themselves thus regarded, managed to survive – and even so, much of the work of some of the greatest figures perished. Only think: Aristophanes was one of a large number of playwrights in fifth-and fourth-century BCE ('Before the Common Era') Athens. From quotations and allusions we know the names of about 170 other comic playwrights and 1,483 titles of their plays. All are lost; just eleven out of more than forty of Aristophanes' own works survive. We have only seven plays by the

tragedian Aeschylus out of seventy whose titles we know. Imagine if, of the thirty-six plays printed in the First Folio of Shakespeare's works (we know of at least one lost play, *Cardenio*, said to have been co-written with John Fletcher), only four were still extant. If we knew the titles of the other thirty-two, what a mighty speculation they would prompt. Imagine if our remoter descendants had just four of Shakespeare's plays, no Cervantes or Goethe but only their names and reputations, a fragment or two of Schiller, no Jane Austen or George Eliot but again just admiring mention of them, a few quotations in others' works from Marx, one leg from Michelangelo's *David*, one copy of a copy of a Poussin painting, a single poem by Baudelaire, just a few lines of Keats, and so on – scraps and remnants, and not always from the best of their time; this is how things in fact stand with regard to classical and Hellenic antiquity. (And consider: by the accidents and ravages of history the future might indeed have little more to offer its inhabitants than this.) It is an irony perhaps that it was people associated with another oriental religion – Islam – which, a couple of centuries later, also irrupted into the classical world (or rather, into what was by then the carcass of the classical world), who saved some of that carcass's legacy from oblivion.[fn2]

As these thoughts tell us, what we know of Plato's predecessors in philosophy – they are conventionally known as 'Presocratic philosophers' even though some of them were contemporaries of Socrates – has come to us in shreds and patches. There are two kinds of sources for our knowledge of them: *fragments*, which are quotations from them in the writings of later commentators, and *testimonia*, which are reports, paraphrases or summaries given by later writers. The scholarly task of identifying and collating this evidence is known as 'doxography'. The term 'doxographer' is also applied to those individuals in ancient times who preserved scraps of the Presocratics' writings or views by quoting or reporting them.

Plato and Aristotle both summarized and quoted Presocratic thinkers – sometimes inaccurately, which well illustrates how careful doxography has to be, given that even these giants could get it wrong. Aristotle is indeed a major source of our knowledge of the Presocratics, because he discussed them often and had three of his students, Eudemus, Meno and Theophrastus, write treatises on various of them. Meno concentrated on their medical writings, while Eudemus wrote about their mathematics and astronomy. Only a few traces of the resulting books survive, as quotations and summaries in the work of yet later writers. Theophrastus discussed the Presocratics' theories of perception in his *On Sensation* and their science in his *Tenets of Natural Philosophy*. A few sections of the first book survive; only the title of the latter remains.

Aristotle and his students were writing about thinkers some of whom lived two hundred years before their time. The next important source is Cicero, writing two hundred years after Aristotle's time, in the first century BCE. Thus already the thread was growing longer and thinner – the thread of memory and transmission of sources (manuscript copies following earlier manuscript copies, with mistakes creeping in). Cicero was a serious student of philosophy who sought to inform his Roman contemporaries about Greek thought. But by his time the first age of philosophical genius had passed, and in the centuries that followed other causes of inaccuracy entered the picture, not least polemics – as in the writings of Clement of Alexandria in the second century CE, whose comparisons between Christian thought and Greek philosophy were not designed to favour the latter. Nevertheless he quotes some of the Presocratics, adding to the doxographical store.

The second century CE in fact offers a fairly rich harvest for doxography. The sceptic philosopher Sextus Empiricus quoted extensively from the Presocratics on knowledge and perception, while Plutarch's *Moralia* quotes them on a wider range of topics. An

anonymous work of the same period called the *Placita* ('Opinions') does the same. This book was originally thought to be by Plutarch, so for convenience its unknown author is called 'pseudo-Plutarch'. Later that century Alexander of Aphrodisias quoted a number of Presocratics in his commentary on Aristotle.

In the early third century CE Bishop Hippolytus of Rome wrote a *Refutation of All Heresies* arguing that Christian heresies arose from Greek philosophy, in the process quoting extensively from the Greek philosophical tradition in order to refute it, thus paradoxically preserving the views he sought to demolish.

One of the most useful sources for the history of Greek philosophy is *The Lives of the Philosophers* by Diogenes Laertius, written in the third century CE. It is an informative and entertaining work, though again not always accurate. It also sometimes, perhaps indeed too often, relies on legend and hearsay, which tempers its value; but nevertheless its value is great. In addition to summaries of biographies and views it gives a bibliography of philosophical works, demonstrating yet again how much has been lost.

There was an earlier text, of course lost, on which the *Placita* drew, which later served as a source for the 'Selections on Natural Philosophy' of John Stobaeus in the fifth century CE. That earlier text is attributed to Aetius, who lived around 100 CE, and who is thought to have himself used Theophrastus' book. Another important fifth-century source is Proclus, one of the last heads of the academy Plato had founded nine centuries before. Plato's Academy (the 'School of Athens') was closed by the Emperor Justinian in 529 CE, along with a general ban on the teaching of philosophy because it conflicted with Christianity.

A very important doxographical source, for all that it dates from a thousand years after the beginning of Presocratic philosophy, is the writings of Simplicius in the sixth century CE. In his commentary on Aristotle's *Physics* Book I he quotes a number of the more important Presocratics, in some cases thus serving as the only source of information we have about their views. Significantly, he says that his reason for quoting so extensively from one of them, namely Parmenides, giving more of the text than was necessary for his argument, was that copies of Parmenides' work were extremely rare and difficult to find, so he felt the need to preserve some of it.

These are the major sources, but not the only ones. Scattered here and there in other writings are mentions, anecdotes and tidbits which the fine net of doxographic scholarship has trawled up. They come, for some examples, from what remains of the writings of Agathemerus the geographer of the third century BCE, the *Chronicles* of Apollodorus of Athens, written in the second century BCE, the book *On Birthdays* by the Roman grammarian Censorinus in the third century CE, and others.

As already noted, neither the fragments nor – perhaps even more so – the *testimonia* can be regarded as completely reliable. Apart from their brief and scanty nature, they were quoted or reported by writers with their own agendas in mind, sometimes hostile to the views of the philosopher being quoted or paraphrased. Questions of language, interpretation, context and relationship to other fragments pose difficulties for understanding what was really meant by the fragment or reported view. This caveat has to be borne in mind.

As a result of the great scholarly achievements of the nineteenth century, when the study of the doxographical sources benefited from advances in philology (the study of language in historical texts), a story of early philosophy emerged which quickly assumed the status of orthodoxy. More recent scholarship, including the discovery of texts like the Strasbourg Papyrus with previously unknown lines by Empedocles, and the Derveni Papyrus containing philosophical quotations among Orphic hymns,

complicates the neat picture that the orthodoxy gives, and throws some of it into question.[fn3] However in its broad outlines the orthodox story is a good starting guide; the detailed refinements and criticism of recent scholarship make better sense if one knows what it is adjusting.

That orthodox story goes as follows.

The Presocratic Philosophers

The Presocratics were given this name by the aforementioned nineteenth-century scholars not because all of them predated Socrates – some were his contemporaries – but because the scholars recognized a significant difference of interest between them and Socrates. This is that the Presocratics were concerned with questions about the nature and origins of the world, whereas Socrates focused his attention on ethics. Accordingly the scholars, following Aristotle's name for them, described the Presocratics as *phusikoi* – physicists.

Before giving an account of each of the major figures individually, it is useful to see where they fit in the first millennium of philosophy.

The first of the *phusikoi* came not from Athens but from Ionia, a flourishing group of cities originally founded by Athenians on the eastern shores of the Aegean Sea. One of the cities, Miletus, was home to Thales, regarded by the Greeks themselves, and by all historians of philosophy since, as 'the Father of Philosophy'. Of course he was no such thing; it cannot be the case that in the scores of thousands of years of human history before the sixth century BCE no one had speculated about the nature and origins of the universe. Indeed, for several millennia before Thales lived, great civilizations were flourishing in Mesopotamia and along the Nile, possessed of astronomy, architecture, bureaucracy and writing, and based on great cities and organized economies; there must have been many thousands of citizens of these elaborate cultures who pondered philosophical questions. But Thales is the first person we definitely know of who wondered about the nature and origins of the universe, and not only wondered, but put forward ideas about them which are distinctively philosophical rather than religious or mythological in character. More on this shortly, because it is indeed a significant matter.

We do not know Thales' dates of birth and death but we do know that he was said to have predicted an eclipse that took place in 585 BCE, so this date is taken as roughly the midpoint of his life – his *floruit* ('he flourished'). The traditional way of viewing the history of early philosophy is to connect the members of a geographical 'school' of thought as if they were members of a real school, with pupil following teacher. This might be right, and I think probably was, even if sometimes a figure identified as someone's pupil might more accurately be described as a follower or as a younger colleague. In any event, history gives Thales a pupil, Anaximander, who likewise had a pupil, Anaximenes, and these three are bracketed together as the first Ionian philosophers.

Whereas Thales and his Ionian successors lived on the eastern margin of the Greek world, the next significant steps in the story were taken on its western margin, in the Greek colonies of southern Italy. Pythagoras – he of the theorem about the square on the hypotenuse – in fact came from Ionia originally, but transplanted himself to Croton on the heel of Italy. The city of Elea, not far from Croton, was the birthplace of a towering figure in early philosophy, Parmenides; the adjective 'Eleatic' is therefore applied to him and to the school of philosophy he founded, his principal followers

being Zeno and Melissus. Contemporary with Zeno was Empedocles, from Acragas in Sicily.

Parmenides is one of the two greatest of Presocratic philosophers; the other is Heraclitus, whose birthplace was back across the Greek world in Ionia. Towards the end of their lives – Heraclitus was slightly the older of the two; Parmenides was still alive when Socrates was born in 470 BCE – the seat of philosophy became, and for several centuries thereafter almost exclusively remained, Athens. Athens saw, apart from Socrates himself, the flourishing of Protagoras, the sophists, the atomists Leucippus and Democritus, and then Plato and Aristotle; and after the latter the schools of Epicurus, the Cynics and the Stoics.

In the final century of the first millennium BCE the centres of philosophy began to multiply again, including Rome and Alexandria as increasingly important homes of debate and enquiry. The last great philosophical movement of antiquity, Neoplatonism, which began with Plotinus in the third century CE and flourished until the seventh century CE, included thinkers associated with those two cities as well as Athens and elsewhere.

Such is an overview of ancient philosophy, a thousand years of it, stretching from the beginnings with Thales in Ionia through Plato, Aristotle, Epicureanism, Stoicism (which provided the outlook of many educated Hellenes and Romans until the advent of the Christian era) and finally Neoplatonism. We now look at the leading figures in this story in more detail.

THALES

Thales was traditionally regarded as one of the Seven Sages of Greece. His *floruit* of 585 BCE suggested to later commentators that he was born in 625 BCE, on the assumption that men reach the midpoint of their lives about the age of forty. His birthplace of Miletus on the eastern shores of the Aegean was a wealthy and flourishing city. He was an astronomer, a mathematician and – despite a reputation for unworldly philosophizing – an engineer of note.

The imputation of unworldliness comes from a story recounted by Plato in the *Theaetetus*, that Thales fell into a well because he was gazing up at the stars so intently that he did not look where he was going.[fn1] It is reinforced by a story Aristotle tells in his *Politics* that Thales' neglect of worldly ambition meant that he was poor, and was reproached for being so by his contemporaries.

The story of the well might have its roots in the fact that if you descend to the bottom of a well you can see the stars even in daylight. The possibility that Thales was doing just that is suggested by other evidence of his practicality. When he was criticized for his poverty he said nothing, but studied the weather carefully until, one year, he was able to predict that there would be a glut of olives. Before this became obvious to anyone else he rented all the olive presses in Miletus, and rented them back at a premium to their anxious owners when the latter came begging for them. Aristotle says, 'In this way he proved that philosophers can easily be wealthy if they wish, but that is not what they are interested in.'

A clincher regarding Thales' practicality is the story that he was hired by the ruler of neighbouring Lydia, King Croesus, to find a way for his army to cross the River Halys without building a bridge. He did it by having the army camp on the bank, then digging a ditch round it and diverting part of the river's flow to make it pass on both sides of the camp, so shallowly that it could easily be forded in either direction.

These credentials help us to evaluate the views Thales held and his reasons for holding them. Obviously he had a serious mind, and there was a good reason why his successors in the tale of philosophy regarded him as the first of their name.

Recall that one of the chief interests of the Presocratics was the question of the nature and source of the world (in the sense of 'universe': the term they used was *kosmos*): hence the label given to them of *phusikoi*, 'physicists'. Their distinctive mark is their rejection of traditional mythological accounts of the cosmos. One such account is offered by Hesiod in his *Theogony*, written about 700 BCE, a work of great and even powerful poetic charm, but scarcely satisfying to an intelligent and genuinely interested enquirer into the nature of the world. Hesiod tells us that 'First of all Chaos came into being ... From Chaos were born Erebos and black Night; From Night, again, were born Aether and Day, whom she conceived and bore after mingling with Erebos ...'

In desiring a more intellectually compelling account, Thales sought to identify the cosmos's *arche*, a word which can be translated as 'principle' and which in the context denotes what the cosmos consists of, or from which it comes into existence, or both. As Aristotle put it in talking of the Presocratics and indeed of Thales specifically, the *arche* is 'that of which all existing things are composed and that from which they originally come to be and that into which they finally perish ... this they state is the element and principle of the things that are ...' Thales' candidate for this principle was: *water*.

Why did Thales nominate water? One might reconstruct his thinking as follows. Water is ubiquitous – it is in the sea, it falls from the sky, it runs in your veins, if you cut a plant you see that it has liquid inside, if you rub a clod of earth in your hands it is damp, we and all animals and plants die without it and therefore it is essential for life. Moreover water could be said to produce the earth itself, for you need only look at the vast quantities of soil produced by the Nile as it floods every year (a reference to the silt thus washed down). And moreover again, as a kind of clincher, water is the only substance Thales knew that can occupy all three material states: solid (when it freezes), liquid (in its basic state) and gas (when it boils away into steam). You might indeed say that water – ubiquitous, essential, productive, metamorphic – is a rather brilliant choice of *arche*, if you lived in sixth-century BCE Ionia.

But it is not so much *what* Thales chose to identify as the *arche* as *how and why* he did so. He did not rely on legends, myths, ancient scriptures, teachings or traditions. He relied instead on *observation and reason*. That is why he is the first philosopher. The contrast with accounts of the cosmos of the kind given by Hesiod is sharp. Hesiod himself no doubt regarded his account as figurative or symbolic, but there is a large difference between being content with figurative accounts and trying to offer a theory that can be supported by observation and reason.

Aristotle also tells us that he interpreted Thales as having held that 'soul' (*anima*) is what causes motion, for he is reported to have said that a magnet has a soul because it moves iron; and further, that 'soul is mixed in with the whole universe, and perhaps this is why Thales supposed that all things are full of gods.' Here one must recall that at the very beginning of philosophy, which is also the very beginning of science, the conceptual resources for explaining motion and change were few. The one thing available for an explanation of how things can move or change was an analogy with one's own human experience of agency: I pick up a stone and throw it into a pool, making a splash; I made this sequence of events happen; so by analogy there must be some similar active principle that accounts for motion and change in the world.[fn2] Indeed we speak of something *animating* something else, harking back to the idea that things other than animals (this word itself betokening 'animated things') have a power

of agency, can move, change or act on other things. What Thales was therefore groping for was an account that would allow a generalization from such phenomena as my experience of agency and the magnet's power to move iron, to an inclusive explanation for alterations of place and state. How else, without a vocabulary yet sufficient for the purpose, to talk of this than to say a magnet has a 'soul', thereby meaning an animating principle, a power of causation or of interaction with other things?

Thales is credited with the injunction 'Know thyself.' He is said to have died when old 'of heat and thirst' while watching a gymnastic contest on a hot day – in short, from dehydration. For one who held that water is the *arche* of the cosmos, this is an ironic end. Diogenes Laertius records a different account of his death, quoting a letter said to have been written by Anaximenes (whom we meet shortly) to Pythagoras. Here the story is that Thales went out one night with his serving woman to look at the stars, 'and, forgetting where he was, stepped over the edge of a steep slope and fell'. Anaximenes then adds, in testament to Thales' position at the fountainhead of philosophy, 'Let us, who were his students, remember the man, and ... continue to regale one another with his words. Let all our discussions begin with Thales.'

ANAXIMANDER

Thales' pupil Anaximander rather startlingly fast-forwards the concept of the *arche*, saying that it is the *apeiron*, 'the unbounded' or 'indefinite' or 'infinite'. This is a remarkable leap from the idea that the *arche* must consist of some form of matter. Unlike his teacher, he wrote a book, 'On Nature', *Peri Phuseos*, and a quotation from it by Simplicius counts as the very first recorded words of philosophy.

Like all the early philosophers, Anaximander was a man of many abilities. He is credited with being the first person to draw a map of the entire world, as the world was then thought to be; and he is said to have predicted an earthquake. The ability to foresee awesome natural phenomena (Thales had his eclipse) seems to have been a mark of genius attributed by later writers, for whereas eclipses might – with difficulty – have been predictable in those days, the ability to predict earthquakes is still, so far, largely beyond science.

Anaximander was said by Eusebius to have developed gnomons for identifying 'solstices, timespans, hours [*horai*] and equinoxes'. Modern scholarship suggests that what he made was a sundial for marking the seasons – not the hours of the day; apparently no sundial for telling the time of day has been recorded as existing before 350 BCE, and *horai* anyway meant both hours and seasons. Diogenes Laertius reports that Anaximander erected a gnomon in Sparta. As this suggests, he travelled; he is said among other things to have been involved in establishing a Milesian colony on the shores of the Black Sea.

Anaximander thought that humans came originally from fish, which looks like an anticipation of evolutionary theory but to think so would be to 'read in' present ideas to what superficially sounds suggestive in ancient ideas. In any case he said we should not eat fish, on the grounds that they are our kin.[fn3] He said that the sun is pure fire and is not, as most people appear to have then believed, smaller than the earth. He said that the moon shines by reflecting light from the sun, and that rain comes from vapours that rise and condense into clouds. He attempted calculations of the relative sizes of the sun, moon and earth, and said that the earth is cylindrical; it is a short fat cylinder, and the upper flat end is where we live, surrounded by an ocean. Diogenes Laertius, however, says that he thought the earth is spherical. In either case the earth

hangs motionless in the midst of the infinite, having no more reason to fall than to rise, or indeed to move in any direction at all.

Anaximander's most distinctive thesis, however, concerns the *arche*. He said that the *apeiron*, 'the infinite' or 'indefinite', is that from which everything comes into being and into which everything finally reverts, by a process which is like reciprocity or compensation. Those famous first-ever words of philosophy, as quoted by Simplicius, express this idea: 'where things have their origin there too their passing away occurs according to necessity; they pay justice and reparation to one another for their injustice in conformity with the ordinance of time.' The concept at work is that nature operates according to laws, and when they are disturbed 'reparation' sets in to restore their proper operation. When 'justice' is interpreted as 'balance' the point becomes yet clearer. His view is reported at more length by Plutarch thus: 'the infinite is the universal cause of the generation and destruction of the universe. From it the heavens were separated off and in general all the worlds, infinite in number. He asserted that destruction, and, much earlier, generation occur from time immemorial, all the same things being renewed.'

The reasoning behind Anaximander's view is suggested by Aristotle in the *Physics*, where he discusses why it might be held that the infinite is the principle of things. First he notes that the infinite can have no other purpose than to be a principle, and can itself have no principle – that is, cannot derive from anything more fundamental than itself, for if it did it would not be a principle. The idea of the infinite is attractive, Aristotle remarks, when we think of the nature of time, and also of mathematics. Moreover if it is held that 'the region outside the heavens is infinite, then body and worlds also seem to be infinite, for why should there be "here" rather than "there" in the void? If body is anywhere, then it is everywhere. Again, if void and space are infinite, body too must be infinite – for with eternal things there is no difference between being possible and being actual.' And Aristotle then identifies a consideration that might relate more closely to Anaximander's view: that 'generation and destruction will come to an end unless there is something infinite from which what comes into being is subtracted.'

The range of Anaximander's interests is impressive, as is the nature of his thinking. His ideas are imaginative and striking – from drawing a map of the world to measuring time and the seasons and the relative sizes of the sun and moon, to conceiving of nature's laws and their balance, of a plurality of worlds, and finally of the cosmos itself as emerging from the infinite – all this indicates a gifted and ingenious mind. Among the early Ionian philosophers he is the most imaginative.[fn4]

ANAXIMENES

As one might expect from a pupil or younger colleague of Anaximander, Anaximenes learned from both his predecessors. He agreed with Anaximander that the *arche* is *apeiron*, infinite; but he did not agree that it was indeterminate. Rather, he agreed with Thales in thinking that it was material, but he identified a different material candidate, with what he took to be greater metamorphic capacities than water and therefore better able to be the source of the variety of things in the world. His candidate was *aer*, somewhat loosely translated as 'air', but meaning a sort of dense moist air or vapour.

His view is given in epitome by Simplicius, quoting Theophrastus: 'Anaximenes ... like Anaximander declares that the underlying nature is one and unlimited but not indeterminate, as Anaximander held, but definite, saying that it is air. It differs in rarity and density according to the substances it becomes. Becoming finer, it turns to

fire; when condensed, it comes to be wind, then cloud; and when further condensed, it becomes water, then earth, then stones, and the rest come to be from these. He makes motion eternal, and says that change also comes to be through the eternal motion of the air.' Note that this last point provides a basis for motion and change without the need to suppose that things have little souls in them.

Anaximenes held that the earth is flat and sits on the air like a lid (thus did Aristotle describe his view). His theory allowed him to say that cloud is 'thickened' moist air, that when it is squeezed rain falls from it, which becomes hail when the water freezes, or snow when there is an admixture of wind in the moisture. Earthquakes occur when the earth is either too dry or too wet, for when too dry it cracks, when too wet it falls apart.

The sun, moon and stars are air refined into fire; they too are flat and 'ride upon the air'. The stars are too distant for us to feel their heat. The sun does not circle underneath the earth to reappear at dawn, but instead rides round the circumference of the flat earth rather as one can make one's hat revolve on one's head. It is hidden from us by distance and mountains as it makes its passage back to the starting point, which is why the night is dark.

A significant point of interest is Anaximenes' concept of condensation and rarefaction as the mechanism of the transformations *aer* undergoes. Thales had not offered a suggestion about how his *arche* could change from liquid to solid and gas, but Anaximenes does. Moreover Anaximenes regarded heat and cold as properties of air, not as substances in their own right; Plutarch writes,

> As Anaximenes of old believed, let us leave neither the cold nor the hot in the category of substance, but as common attributes of matter, which come as the results of its changes. For he declares that the contracted state of matter and the condensed state is cold, whereas what is fine and 'loose' (calling it this way with this very word) is hot. As a result he claimed that it is not said unreasonably that a person releases both hot and cold from his mouth. For the breath becomes cold when compressed and condensed by the lips, and when the mouth is relaxed, the escaping breath becomes warm because of rareness.

The observation that air blown through pressed-together lips is cool, but warm when exhaled from an open mouth, is verifiable: one can do the simple experiment and feel the proof on the back of one's hand. This shows that Anaximenes' views were attempts to make sense of observation, and – this is the significant point – doing so in a systematic, inclusive theory that brought all phenomena together into a single explanatory framework constrained by those observable facts. That the resources both conceptual and practical for devising such a framework were primitive – these thinkers were starting from scratch – only makes one admire them more.

PYTHAGORAS

Next in historical order is Pythagoras, but he is personally something of a mystery. There was certainly a Pythagorean school or cult, perhaps a religious order, that had something to do with a charismatic individual called Pythagoras, and the contribution of this order to mathematics and related subjects is very considerable. Its teachings influenced Plato, who however mentions the individual Pythagoras only once by name, saying that his followers were profoundly devoted to him. The remark occurs in Book X of Plato's *Republic*: 'his disciples loved him for his teaching ... even now his latter-day followers stand out for their manner of life.' Aristotle mentions him only twice in his

extant works, but wrote a book on his school which has been lost. Quotations from it in later sources suggest that Aristotle wrote chiefly about the religious aspects of Pythagoreanism. Indeed the stories associated with the individual Pythagoras tend mainly to appear in the later doxographical tradition, by that time relying on legends and mystical traditions of a dubious kind.

The earliest reference to Pythagoras occurs in verses by Xenophanes, which relate that Pythagoras stopped a man from beating a dog because he heard the voice of a deceased friend in the dog's howling. This conforms with the Pythagorean doctrine of metempsychosis, that is, the transmigration and reincarnation of souls. Pythagoras is said to have forbidden his followers to eat beans because they contain the souls of the dead.

Another early reference to Pythagoras is found in a fragment of Heraclitus' work. Heraclitus, who lived just a generation after Pythagoras, praised the advances he had made in science, but said that he had misused them for charlatanry. This lends credence to the idea that the Pythagorean group was more than a philosophical school, being dedicated to a religious way of life also.

By origin Pythagoras was an Ionian. His *floruit* is given as 532 BCE, suggesting a birth year of about 570 BCE. He was born at Samos, an island close to the Ionian coast between Ephesus and Miletus, during the reign of Polycrates, and is said to have left Ionia for the city of Croton in Italy in order to escape Polycrates' tyrannical rule. This detail is implausible; other sources say that he undertook diplomatic missions at Polycrates' behest, and in any case the court of Polycrates has been regarded as an enlightened one, at which the poet Anacreon and the famous engineer Eupalinos of Megara lived. Whatever prompted Pythagoras to leave Samos, legend has it that he first travelled widely in Egypt and the East before settling in Croton, and hagiographers credit some of the doctrines associated with him to his studies there. It is something of a reflex among doxographers to credit several of the early Greek thinkers with acquisition of wisdom 'from the East'. The belief that the East is a source of especially deep wisdom persists into our own day.

It seems that the religious aspect of Pythagoreanism was focused on worship of Apollo. For a time the order wielded considerable political influence in the Greek cities of south-eastern Italy, but lost its influence in an uprising that followed Croton's destruction of the city of Sybaris in 510 BCE. A follower of Pythagoras, a famous champion wrestler called Milo who led the Crotonites in their victory over the Sybarites, was burned to death with other Pythagoreans in their lodge when the citizens of Croton rose against them, thinking that Milo intended to impose a dictatorship on them. Only two members escaped. In Diogenes Laertius' account, Pythagoras himself was present in the house when it was attacked, and attempted to flee; but he was captured when he found himself at the edge of a beanfield, which he would not cross because of his scruples. 'And so', says Diogenes, 'his pursuers cut his throat.' Other lodges in other cities were burned down also, the cohesion of the order being thus destroyed and its survivors dispersed.

Neither Plato nor Aristotle quotes any sayings of Pythagoras, and much of what is claimed to be reports of his teachings has turned out to be forgery. What is at least certain is that the Pythagoreans believed in metempsychosis, and were vegetarians (though, as we have seen, they avoided beans) on the basis that animals and humans are kin and to eat flesh is a kind of cannibalism. Indeed some of the teachings ascribed to Pythagoreans, especially the *akousmata* ('things heard'), that is, the symbolic rules of the order, suggest a survival from concepts of taboo. They include proscriptions against breaking bread, stepping over crossbars, touching white cockerels, walking on

highways, letting swallows live in the roof of your house, and looking at yourself in a mirror next to a light. Pythagoreans were instructed to roll up their bedclothes when they got up in the morning, and to smooth out the impress of their bodies on the mattress.

It is unfortunate for our understanding of the philosophy of Pythagoras that the legends which grew around him centuries after his time obscure how much influence he had on Plato and others. In the texts of the Neoplatonist philosophers Porphyry and Iamblichus, writing much later in the third and fourth centuries CE, he is represented as a prophet-like holy man who had received divine revelations. Iamblichus calls him 'the divine Pythagoras' in his treatise *On the Pythagorean Life*, and Porphyry says, 'No one else has had greater or more extraordinary things believed about them' (*Life of Pythagoras*). Some of these views led to the theory that much of Plato's own thought is borrowed from Pythagoras.

It would be easy to think that Pythagoreanism is just another of many cults and movements predicated on primitive beliefs. But the school's contribution to mathematics and science make it unignorable. Indeed even among the more cult-like aspects there are points of interest: Pythagoreans believed that music purifies the soul, important for a belief-system seeking to help the soul escape from 'the wheel of rebirth' as was the aim also of Orphism and other mystical cults. Moreover Pythagoreans divided people into three kinds, on analogy with people who attend the Games: some come to compete, some to buy and sell under the stands, and some to spectate – for which the Greek verb is *theorein*, from which we get 'theory'. The philosophers are those who spectate or look upon the world to study it. These latter are the best kind of people therefore, said the Pythagoreans, and closest to purification and consequently to escaping from the cycle of rebirth.

The mathematician Aristoxenos said that Pythagoras was the first to take the study of arithmetic beyond the practical needs of commerce. The Pythagoreans introduced a way of representing numbers by arrangements of dots in triangles, squares and rectangles, and demonstrated a number of arithmetical properties through the geometries of these arrangements. The number-shapes had religious significance too: the one by which Pythagoreans swore their oaths was the 'tetractys of the decad', that is, a triangle of dots with a row of four along the bottom, three above that, then two, and then one, adding up to ten. Pythagoreans thought that ten is the natural basis of counting, and gave it a mystical significance. There is of course an infinity of 'triangular numbers' – three is represented as the triangle of two dots with one dot above it; six is represented as a triangle of dots arranged '3–2–1'; ten we have seen, fifteen is '5–4–3–2–1',

and so on. Rows and columns of the same number of dots as each other give 'square numbers', while 'oblong numbers' are those in which the columns have one less dot than the rows:

We now use numerals ultimately derived from India (though now called 'arabic numerals' because the Arabs transmitted them to the world at large), but we still often call numbers 'figures'.

If there is one thing almost everyone knows about the Pythagoreans, it is 'Pythagoras' theorem', stating that the square of an hypotenuse (this being the longest side of a right-angled triangle, opposite the right angle itself) is equal to the sum of the squares on the other two sides: where a is the hypotenuse, $a^2 = b^2 + c^2$. This was in fact known to Thales, to Egyptians in their geometry of land-mensuration and to Babylonians and Indians long beforehand; but it is possible that Pythagoras or a follower discovered a proof.

A major achievement of the Pythagorean school was its discovery that the pitch of a musical note depends on the length of a string whose vibrations produce the note, and that simple numerical ratios explain the consonant intervals of the scale: 2:1 octave, 3:2 perfect fifth, 4:3 perfect fourth, and so on. To understand this, think of two guitar strings of equal length, tension and thickness. If they are both plucked together they sound the same. If different lengths of each are plucked, they sometimes sound dissonant and sometimes consonant. This latter observation underlies measurement of consonant intervals – an interval being the distance between two notes, and a consonant interval being one in which the two notes sound good together. Experiment will show that if you have two lengths of string of equal length, tension and thickness, plucking one while simultaneously plucking exactly half the length of the other will yield a consonance – this is the octave. If the second string is plucked at two-fifths the length of the first, the resulting consonant is a perfect fifth (go to a piano and play the notes middle C and G above middle C together: that is a perfect fifth).

This discovery, even more than the theorem about the square on the hypotenuse, has been hailed as the first step of true science, because it provides a quantified description of an observable phenomenon. And in its extension to the idea of the 'harmony of the spheres' it generalizes the idea to all nature. The Pythagoreans thought of the heavenly bodies as emitting a hum as they flew through space, the distances between them being such as to form a scale: earth and moon are a tone apart, moon to Mercury a semi-tone, Venus to the sun a minor third; Mars to Jupiter and Jupiter to Saturn are each a semi-tone, and Saturn to the sphere of the fixed stars is a minor third.

For the Pythagoreans as for others – including Plato – the idea of harmony came to have more than just the mathematical significance of ratios producing consonances; it became a key metaphor in thinking about matters ethical and psychological also. Just by itself, however, without further philosophical applications, it represents a notable step.

The insights and discoveries of Pythagorean mathematics led not just to ethical ideas but to a metaphysics in which reality itself is regarded as constituted by number. Allegedly the motto above the entrance to a Pythagorean lodge was 'All is number'. Think of the dots as atoms; that is not how the Pythagoreans put it, but the connection is a natural one to make, the more so as the structure of material objects – think of a crystal – is informatively describable in terms of geometries. This might not have been what the Pythagoreans meant, for Aristotle reports that they assigned numerical values to certain abstractions such as justice and marriage: justice is four, marriage three, 'the right time' is seven. Odd numbers were said to be male, even numbers female. The meaning of such views is unclear. But it is also likely that they thought of the world as consisting structurally of whole numbers and their ratios, as their

reaction – their horrified reaction – to the discovery of *irrational numbers* suggests. This is explained as follows.

Consider the relationship between the length of a side of a square and the length of the diagonal drawn from one corner of the square to the opposite corner. There is no way of expressing the ratio of the length of the diagonal to the length of a side in integers (whole numbers). Pythagoreans regarded this incommensurability as a ghastly, indeed an evil, phenomenon.

To see what is at stake, consider a square of which each side is one metre in length. To determine the length of the diagonal seems easy, for it is the hypotenuse of the right-angled triangle it forms with two sides of the square. We know that the square of the diagonal's length is the sum of the squares on the other two sides: it is two metres square, for $(1 \times 1) + (1 \times 1) = 2$. But what is the square root of 2? Well, obviously, it is the number which, when multiplied by itself, makes 2. What is that number? It cannot be 1, because $1 \times 1 = 1$. It cannot be 2, because $2 \times 2 = 4$. It is therefore something in between 1 and 2. But whatever it is, it cannot be expressed as a ratio of two integers; it is not a simple fraction. This is best understood in decimal terms: an irrational number is one whose decimal expansion never either terminates or becomes periodic (repeats regularly). How can nature consist of numbers that misbehave in this way?

The discovery of irrational numbers was so traumatic for the Pythagoreans, legend has it, that the man who made the discovery (or, some of the legends say, the man who revealed it after the order's members had been sworn to secrecy about it), namely Hippasos of Metapontum, was punished by being drowned.

The discoveries and views of the Pythagoreans seem so different from those of their Ionian predecessors that it is a relief to find oneself on more familiar ground with their cosmology. Here indeed they seem to have borrowed from both Anaximander and Anaximenes. Aristotle relates that the Pythagoreans thought that beyond the heavens there exists a 'boundless breath' which the world inhales, thereby acquiring cohesion and order. This is a little reminiscent of Anaximenes, as is an extension of his concept that the *arche* is *aer* into the idea that darkness is very condensed air. Anaximenes' *aer* is unlimited, like Anaximander's *apeiron*, and the Pythagoreans make Darkness 'the Unlimited' and Light 'the Limit'.

Pythagoras is credited with thinking that the earth is a sphere, and later writers also claimed that he thought the cosmos is heliocentric, which is why the Copernican heliocentric model of the universe was described as 'Pythagorean'. The idea that the heavens beyond the system of the planets, however arranged, are wheels of burning air which we see through apertures in the underside of the sky – these apertures therefore being the stars – is a conception that the Pythagoreans might have taken from Anaximander. The latter thought there were three such wheels, and the Pythagoreans very likely identified the gaps between them with the three musical intervals they had discovered, namely, the octave, fifth and fourth: the 'music of the spheres'.

It was the musical discovery that the consonant intervals can be expressed as simple numerical ratios that is the great legacy of Pythagoreanism. The idea of *harmonia*, harmony, opened a set of conceptual possibilities which proved to be very influential. It suggested that opposites can be brought into harmony, or can produce harmonies in their interactions, not least by blending – as when wet and dry, hot and cold balance each other or temper each other's excesses. Indeed the idea of temperament in early medical science – the harmonious balancing of the choleric, phlegmatic, melancholic and sanguine 'humours' – was held to be constitutive of good health; the concept of temperature as a relation between hot and cold, and the ethical 'Doctrine of the Mean'

as the virtuous middle path between vicious extremes (thus, courage is the middle path between cowardice and rashness), all owe themselves in one or another way to the idea of *harmonia*. 'It is not too much to say', wrote the historian of ancient philosophy John Burnet, 'that Greek philosophy was henceforward to be dominated by the notion of the perfectly tuned string.'

XENOPHANES

Xenophanes' *floruit* lies somewhere after the middle of the sixth century BCE, making him a contemporary of Pythagoras. But he lived a long time, dying in his nineties after a life of wanderings. We have a quotation from him which says, 'By this time sixty-seven years have tossed my careworn soul up and down the lands of Hellas; and [these wanderings] began twenty-five years after my birth,' thus making him ninety-two at the time he wrote these words.

We can imagine these words as a reply to a question he asks in one of his poems: 'This is the kind of thing we should say by the fireside in winter, as we lie on soft couches after a fine dinner, drinking sweet wine and crunching chickpeas: "What country do you hail from, good sir, and how old are you? And how old were you when the Mede came?"' The reference to 'the Mede' is to the conquest of Ionia by Harpagos, a Mede who served as a general in the army of the Persian King Cyrus. The Ionian cities had formerly been under the sway of King Croesus of Lydia, and when Cyrus attacked Lydia he asked the Ionians to revolt in his support. They refused, so after his victory in 540 BCE Cyrus sent an expedition to punish them. Rather than submit to Persian rule many of the Greeks sailed away from their cities; the entire population of Phocaea did so, resettling in Sicily. Xenophanes' poignant question, 'How old were you when the Mede came?' doubtless resonated with the diaspora of refugee Ionians who could still remember their homes on the eastern shore of the Aegean.

His dates, though uncertain, are bracketed by several facts. One is that he is said to have heard Anaximander lecture. Another is that he referred to his contemporary Pythagoras in the past tense, which indicates that Pythagoras died before he did. An unreliable tradition says that he was a tutor to Parmenides, which would place him in southern Italy some time in the last two decades of the sixth century BCE. In his own turn Heraclitus refers to Xenophanes in the past tense, suggesting that he was dead by the time of Heraclitus' maturity in the early fifth century BCE.

Xenophanes' birthplace was Colophon, an Ionian city between Miletus and Ephesus and therefore close to Pythagoras' birthplace of Samos. Assuming the references in his fragments mean what they seem to mean, he left Colophon when it fell to Harpagos' army, aged twenty-five, and thereafter wandered until his death. He wrote in verse on a wide range of subjects, some of them philosophical, though it is a matter of controversy whether he wrote a philosophical poem as such. Quotations of a philosophical bent mainly come from his satirical attacks on Homer and Hesiod, whose anthropomorphic account of the gods he despised.

This latter is indeed one of the most distinctive facts about Xenophanes: his emphatic rejection of traditional religion and its anthropomorphic Olympian deities. He argued that there is no such thing as divination; such natural phenomena as earthquakes and rainbows are not messages from the gods, he said, but should be naturalistically investigated and understood.

He was critical also of the Greeks' obsession with athletics and athletes, and the expenditure of public money on both, saying, 'Far better is our art [i.e. poetry] than the strength of men and horses! These are but thoughtless judgments, nor is it fitting to

set strength before goodly art.' He points out that even if there arises a boxer mightier, a runner swifter, a wrestler more skilful, than others, 'the city would be none the better governed for that. It is little joy to a city if a man conquer at the Games; that does not fill its store-houses.'

In line with his attitude to enquiry he took a keen interest in the natural world, noting the presence of fossils of fish and seaweed on mountain tops, and speculating about meteorological phenomena and the extent of the world in both breadth and depth. Regarding this latter, he thought that the earth extended indefinitely downwards, and that therefore the sun could not circle beneath it at night. Instead there is a new sun every day, gathered together out of 'many small fires'.

It is in Xenophanes that we read the anecdote about Pythagoras hearing a dead friend's voice in a dog's howls. This was satire on Xenophanes' part; he thought the doctrine of metempsychosis silly. He was scathing about Homer and Hesiod because they 'ascribed to the gods all things that are a shame and a disgrace among mortals, stealings and adulteries and deceivings'. He said that 'if oxen and horses or lions had hands, and could paint with their hands, and produce works of art as men do, horses would paint the forms of the gods like horses, and oxen like oxen.' He thought instead that there is a god which is nothing like anything we know, and which (see below) might in fact be the same thing as the world itself.

In the passages where he addresses topics central to the thought of his Ionian predecessors he shows that he knew their ideas well, and had been influenced by them. 'All things come from the earth, and all things end in earth ... All things are earth and water that come into being and grow.' He seems to have thought that the earth is being progressively dissolved into the sea: 'All human beings are destroyed when the earth has been carried down into the sea and turned to mud. This change takes place for all the worlds.'

That last sentence has caused a debate among scholars. It suggests, under the influence of Anaximander, that there is a plurality of worlds; but elsewhere in the commentaries on Xenophanes, and in Aristotle's remarks about him, he appears to have held that 'the World is One,' a doctrine which, as we shall see, was held by Parmenides, who was influenced by Xenophanes even if he was not actually taught by him. But the unclarities and apparent inconsistencies in Xenophanes' views are not all to be blamed on him. A later member of the school founded by Aristotle – the Peripatetic school – wrote a treatise on Xenophanes and two other thinkers, in which he said that Xenophanes claimed that the world is neither finite nor infinite, and neither in motion nor at rest. Simplicius, writing much later, was frankly baffled by such claims.

But, whatever Xenophanes actually meant, there are suggestive hints in these views that relate him to Parmenides. Aristotle says in the *Metaphysics* that Xenophanes was the first to argue that reality is 'One', and Plato called Xenophanes 'the first of the Eleatics', these being the philosophers of Parmenides' school who subscribed to the doctrine that reality is a single unchanging eternal thing. Aristotle went further to suggest that Xenophanes thought that the world and god are the same thing; in one fragment indeed he says that the world and god are 'equal every way'.

As the commentators remind us, it would be a mistake to interpret talk of 'god' in this context as if it has the same sense as in far later views about deity, such as those familiar from Judaism and Christianity; for in effect Xenophanes' denial of the existence of the traditional gods, and his assertion that god and the world are one and the same thing, are jointly intended to imply 'there is no god but the world.' Apart from the connection with Parmenides' views, these notions – if indeed this is what

Xenophanes meant – also anticipate the philosophy of Spinoza, who lived more than two thousand years later.[fn5]

Something that anyone reading these pages might cherish in Xenophanes is his account of a dinner of philosophers, in which he writes, 'The floor is clean, so are our hands, and so are the cups ... a mixing bowl stands by, and another bowl of gentle flower-scented wine ... there is cold sweet pure water, golden loaves of bread, and a magnificent table laden with cheese and rich honey ...' The 'cheerful men' (always only *men*, alas) pour a libation pledging always 'to do acts of justice'; the drinking is continent, just enough to allow everyone to get home afterwards unaided; and the talk is not of myths and wars, but of 'excellence' (*arete*).

HERACLITUS

One sure way to live in philosophical memory is to issue striking remarks that are obscure or ambiguous – or better still a mixture of both. Heraclitus is an example. Known as 'the Obscure', 'the Dark' and 'the Riddler', he sauced his obscurities with arrogance and misanthropy. He was an aristocrat, born in Ephesus about 540 BCE or soon afterwards, whose family were part of the city's ruling elite. He gave his hereditary political office of 'Basileus' to a brother, and later in life went to live a rustic hermit's life, though he returned to the city when he fell ill, and died at about the age of sixty.

He wrote a book, a copy of which was given to Socrates by the playwright Euripides (so says Diogenes Laertius, reporting what is probably a mere legend). Euripides asked him what he thought of it. Socrates replied, 'What I understand of it is splendid, what I don't understand of it is probably splendid too; but it would take a Delian diver to get to the bottom of it.'

A major problem with understanding Heraclitus' philosophy is that the surviving fragments of his book are obscure in themselves, and it is not clear how to arrange them in order, which is a problem because different orders support different interpretations. Aristotle in the *Rhetoric* complained that it was hard to know how to punctuate Heraclitus' sentences to clarify their sense, and gives as an example the only sentence whose position in the work we know, namely, its opening sentence: 'Of this account [*logos*] which holds forever men prove uncomprehending.' Is it the *logos* that holds forever, or are men forever uncomprehending?

We do not even know the title of his book, which would be some guide to what it is about; later doxographers said that it had three parts, one on nature, one on politics and one on theology. This is a break with the philosophical tradition to that point, in ranging more widely than cosmology. But which of these subjects contained the main point of what he wished to say? Given that it appears to have been written in a consciously oracular style – one imagines that comparisons with Nietzsche's *Thus Spake Zarathustra* might be suggestive (and perhaps with its author too) – one can see how difficulties increase.

The account Heraclitus gives of the nature of the world is accompanied by remarks on perception, knowledge and enquiry: 'Nature loves to hide ... the eyes are more exact witnesses than the ears' (does he mean: To observe for oneself is better than to listen to what others say?). Even those who, like Pythagoras, engage in scientific enquiry do not get things right: 'The learning of many things does not teach understanding, otherwise it would have taught Hesiod and Pythagoras, and again Xenophanes and Hecataeos.' In any event Heraclitus thought that he had grasped the correct *logos* – a word used by Greek philosophers in such a variety of ways that it can be taken to mean

any and more of 'account', 'theory', 'framework', 'word', 'reason', 'significance', 'principle' and as we might say 'the underlying logic (of something)'. One reasonable reconstruction of Heraclitus' account is as follows.

Everything is in flux; as Plato puts it in the *Cratylus*, 'Heraclitus says that all things pass and nothing stays, and comparing existing things to the flow of a river, he says that you could not step into the same river twice.' Heraclitus' disciple Cratylus, who was so convinced that everything is constantly changing, would not reply when spoken to but would only waggle his finger to indicate that he had heard, because by the time he was ready to answer, the world had changed.

Some commentators disagree that Heraclitus meant what Plato says he meant. Rather, they say, he meant that things stay the same only by changing – as is the case with a river; its flux does not destroy its continuity as the same river, but in fact constitutes it.

This latter reading is more consistent with another of Heraclitus' doctrines, that of the 'unity of opposites'. One interpretation of this is that a thing can combine opposite qualities: 'sea is simultaneously the purest and the foulest water: for fish it is drinkable and healthy, for men it is undrinkable and harmful.' Likewise youth and age, waking and sleeping, life and death are 'the same thing in us ... for having changed round they are these, but when changed round again they are those', though in these cases not simultaneously. But others of his fragments seem to say that opposites are in fact identicals: 'the straight and the crooked path of the fuller's comb is one and the same ... the way up and the way down is one and the same.' These remarks are true: a staircase is both up and down simultaneously, differentiated only by whether you are ascending or descending. 'Men do not know how what is at variance agrees with itself. It is an attunement of opposite tensions, like the bow and the lyre.'

Another identification of opposites requires, however, a more studied interpretation: one fragment says, 'good and ill are one.' Does this imply a version of Hamlet's 'there is nothing either good or bad, but thinking makes it so'? Most likely the explanation is deeper, for Heraclitus seems to have held that it is by the conflict or tension that holds opposites together that existence itself is made possible: 'Homer was wrong to say, "Would that strife might perish from among gods and men!" He did not see that he was praying for the destruction of the universe, for if his prayer were heard all things would pass away ... all things come into being and pass away through strife ... strife is justice, all things happen according to strife and necessity.'

Following Aristotle, many commentators see Heraclitus as conforming to the tradition of the earlier Ionians in being a material monist, that is, as holding the view that there is a single underlying material *arche*. As we saw, his predecessors had successively nominated water, the infinite and air; he nominated fire. 'The cosmos, which is the same for all, was not made by gods or men, but it was ever, is now, and ever shall be, an ever-living fire, parts of it kindling, and parts of it going out ... fire is lack and abundance ... All things are an exchange for fire, and fire for all things.' Fire turns into water, and half of water turns into earth and half into a fiery wind, and both can turn back into water and water back into fire. These changes are the result of the strife that is an application of justice which reverses the domination of one thing by another.

It might seem that the fact of eternal flux and change makes knowledge impossible, and Plato thought that Heraclitus meant this. But his remarks about the value of learning, and his criticism of others for not achieving understanding even though they study and enquire, suggest otherwise. Indeed it appears that he attached great ethical significance to knowledge: 'Sound thinking is the greatest virtue and wisdom; [it is] to

speak the truth and act on a proper understanding of the nature of things.' This is why he says of himself that his preference is for 'seeing, and hearing, and learning'.

Pythagoras had taught a way of life; Heraclitus offers wisdom teachings of his own. Like many others he counselled moderation and self-control in such activities as drinking and eating, but unlike many others he frankly extolled the pursuit of fame: 'The best choose one thing above all else, everlasting fame.' Since he also thought that the best deaths occur in battle, it is not clear that he meant philosophical fame. He said 'character is fate,' and that it is not good always to get what one wants.

In politics he advocated the rule of law – 'The people must fight for [the city's] laws as for its walls' – and a wise choice of rulers. Both pieces of advice are consistent with the idea that there is a cosmic *logos* (which can be interpreted as saying: the cosmos is governed by universal laws) and that rationality – the rational apprehension of these universal laws – applies as much to ethics and politics as in cosmology. But he was not a proto-democrat; he had no time for 'fools' and 'the many ... the mob'. 'Most men's teacher is Hesiod; they are convinced he knew most things – he, a man who could not recognize that day and night are one.'

It cannot be denied that other and later philosophers were struck by Heraclitus' views – how can one say 'influenced' by them given that neither they nor we are quite clear what they were? Of course his contemporaries and successors had their interpretations of what he meant, and were doubtless influenced by those; but one could extrapolate quite different results for later thinking from this. Some think Parmenides developed his philosophy in opposition to Heraclitus, others see Democritus echoing Heraclitus in his ethical pronouncements; Plato is often read as employing an interpretation of Heraclitus in arguing for the transience and instability of the material world, and from Parmenides in arguing for the eternity and immutability of the intelligible world. Some saw Heraclitus as squarely in the Ionian tradition of physics, others as a sceptic. Such is the fate, and the usefulness, of being a 'Riddler'.

PARMENIDES

Parmenides was born to a wealthy family at Elea either around the year 515 BCE, as Diogenes Laertius says, or a decade or two later, so that Plato's claim that the young Socrates met him around 450 BCE can be regarded as plausible. Diogenes follows Aristotle in saying that he was a pupil of Xenophanes, but that he did not agree with Xenophanes' views. However, like his teacher he wrote his philosophy in verse, using Homeric hexameters embellished with Homeric images, especially from the *Odyssey*. Diogenes says that it was also claimed that Parmenides studied with Anaximander, and that at one point in his life he associated closely with a Pythagorean called Ameinias, of whom he was very fond, as evidenced by the fact that when the latter died he built a shrine to him 'as to a hero'. One reason suggested for this devotion was that Ameinias had persuaded Parmenides to dedicate his life to philosophy. Some in the doxographic tradition described Parmenides as a Pythagorean, and there is no reason to think he might not have been one in his earlier days, though by the time he wrote his poem he no longer was.

Parmenides' poem tells of a young man who is taken up in a chariot to meet a goddess, who promises him that he will learn all things from her.[fn6] But, she says, even though everything she tells him will be true, he must test what she says for himself: 'judge by argument', she says, 'the much disputed proof uttered by me.' After a lengthy introduction, the Proem, the poem itself begins with the first of two sections,

entitled 'Truth'. We have about 150 lines of the poem, over two-thirds of it from this section. The second section is entitled 'Opinion', and the goddess warns that it concerns a view of the world that is deceptive; it is about our ordinary, sense-based view of the world, and the senses are misleading. By contrast, the first section, 'Truth', tells us that knowledge properly so called is possible only in relation to 'What Is', to *reality*, because 'What Is Not' literally cannot be thought or said. Only reason can get us to the truth about What Is.

This truth is that What Is must be a single unchanging and complete thing, perfect, whole and eternal. The views of other philosophers, premised on the transformation of an *arche* into a plurality of things based on motion and change, on interaction, flux, reparation, mingling or whatever the thinkers in question have suggested, are false in the light of reason, for only an eternal, immutable and comprehensive One is thinkable.

At the beginning of the section entitled 'Opinion' the goddess says, 'Here shall I close my trustworthy speech and thought about the truth. Henceforward learn the beliefs of mortals, giving ear to the deceptive ordering of my words.' She then sets out a cosmology in which fire is of the heavens and is opposed to 'dark night, a compact and heavy body ... everything is full at once of light and dark night, both equal, since neither has anything to do with the other.' In the heavens 'Necessity' binds the stars; the sun, moon, Milky Way and other phenomena are either 'unmixed fire' or have their portion of night, this explaining the variation among them; and 'in the midst of these is the divinity that directs the course of all things; for she is the beginner of all painful birth and all begetting, driving the female to the embrace of the male, and the male to that of the female.'

But this 'way of opinion' or 'way of seeming' is, to repeat, deceptive; it is the path 'wandered by know-nothing two-headed mortals' who think they live in a world of contingency, plurality and change. On the deceptive evidence of their senses they believe that things can both be and not be – because, for example, a thing can have a certain property at one time and lack it at another. 'Do not follow this path out of habit, relying on your senses,' the goddess again warns the young man; 'judge by reason.' But it is important to know this 'way of seeming' so that one can contrast it properly with the way of truth. 'You must find out everything,' she tells him, 'both the steadfast heart of well-rounded truth and the opinions of mortals. In these opinions there is no truth, but you must learn them anyway.'

The central point in Parmenides' system turns on what he meant by 'What Is'. He has the goddess say that What Is is 'unborn and unperishing ... a unique whole ... unmoved ... perfect, complete'. And she adds, 'Nor Was It once, nor Will It be, for It Is Now, One, Continuous.' The questions this raises are: is the What Is physical, or is it a non-physical thing, an abstraction like 'the infinite' or perhaps a god? If it is physical how do we make sense of the fact that, on almost all views, spatio-temporal properties are distinctive, indeed defining, of the physical, whereas Parmenides' What Is is both all there is (all space) and does not change (at very least complicating what can be understood by time, if time exists at all)?

Obviously this interpretative question is controversial, but the larger consensus is that Parmenides viewed the What Is as physical. One fragment describes it as a sphere, and Aristotle stated that Parmenides did not believe in any sort of non-physical reality. Nor does he speak of a 'god' or 'gods' in connection with reality (the goddess of the poem is a literary device merely), but appears to regard What Is as the universe itself, as everything viewed in totality as one thing – a plenum or complete fullness of physical reality.

This raises the question whether the sphere is infinite, for if not then space has to be finite so that the sphere can fill it completely. Either way, if the sphere is physical it has to comprehend all space because it is unmoving and unmovable; and because it is unchanging we have to think either that there is no such thing as time, or What Is comprehends all time in one changeless present. This seems to be the meaning of the fragment stating 'Neither is there, nor will there be, time apart from being, because fate has bound it down to the whole and unmoved.' That at least is consistent with the central thesis that reality is an unchanging One; on the view that time exists only where there is change, in the envisaged plenum of What Is there can be no change and hence no time, or only an eternal present.

Indeed as there can be nothing beyond or outside What Is, the particular concepts of change and motion are empty. There could only be change and motion if beyond What Is there is also What Is Not, in this sense: if you think with Anaximenes that the *arche* rarefies and condenses, then the change of one state (more rarefied) into the other state (more condensed) and vice versa presupposes that the state into which the *arche* changes its aspect was, as it were, not there – there was no 'being more condensed' for the 'less condensed' to become more of, for if there were no such not-then-existent state, there would not be something for a different state to change into. Likewise, the Pythagoreans' talk of the air outside the cosmos which enters to separate the cosmos into distinct units also assumes the existence of 'what is not', as the thing that motion and change act upon to turn it into 'what is'.

The key point for Parmenides is that one cannot think about *what is not*, whereas anything that can be thought must *be*. 'It is the same thing that can be thought and that can be ... It needs must be that what can be spoken and thought *is*; for it is possible for it to be and it is not possible for what is nothing to be.' Another way of putting this is to say: if you think, you must be thinking of something; therefore there cannot be *nothing.* 'Only that can exist which can be thought ... thought exists for the sake of what is.'

Note that Parmenides does not offer mere assertions in the section on Truth; he offers arguments. The striking contrast between the two sections of the poem lies in the fact that in the first we are asked to consider that What Is has to be comprehensive – it has the character of tautology to say 'whatever is, is' – and that one cannot think or say What Is Not because What Is Not is by definition nothing. It appears paradoxical to think that one might have Nothing as the object of one's thought. One might reasonably have much to say about how in fact we talk about what is not the case (but which is possible, or was the case, or will be the case but is not so yet, and so on), and one might question the claim that the realm of the real and the realm of the conceivable are necessarily the same and exclusive. But at least these are deep challenges, and philosophy has grappled with them throughout its history. This is very different from saying 'there is fire and dark night, and the mixture of the two, and in the midst of things the divinity that directs their courses ...' We see from earlier Presocratics that not all such theorizing – 'the *arche* is water ... is air' – is mere assertion, but rests on some sort of observational and inferential support; but the 'way of seeming' in Parmenides' poem does not have quite that character, even if it borrows from what was undoubtedly an observational base in asserting that fire is of the heavens, because where could the light of the heavenly bodies come from if they were not themselves fires or emanations of fire? And as it happens, they are indeed fires – or, for the more local of them, reflections of fire.

Parmenides was not quite as obscure a writer as Heraclitus, but the hexameter verse in which his system is expounded nevertheless creates difficulties for a clear

interpretation. Despite that, he marks a highly significant moment in the history of philosophy; he is a turning point, for the influence he exerted on those who came after him was enormous, whether they accepted his views or disagreed with him. His followers Zeno and Melissus defended his theory of the One, Zeno with his famous paradoxes – Achilles and the tortoise and the rest: see below – aimed at demonstrating the impossibility of time and change, while any thinker who accepted the reality of change and plurality had to address Parmenides' arguments and find ways of overcoming them.

Parmenides' greatest influence, from the point of view of impact on the entire subsequent history of philosophy, was on Plato and the Platonists. Plato admired Parmenides greatly; he has him worsting Socrates in a late dialogue, and he derives from him the view that the senses and what they tell us about the world of appearances – the familiar world around us, which seems plural and subject to time and change – deceive us as to the true nature of reality. That is a theme which has underwritten an enormous amount of what philosophy and, later, science has achieved.

ZENO OF ELEA

Plato's *Parmenides* and Diogenes Laertius' *Lives of Eminent Philosophers* are almost the only sources of information we have about Zeno's life. If Plato's account is correct, Zeno was born in 490 BCE, and accompanied Parmenides to Athens in about 450 BCE where the young Socrates met them.

Zeno was said to be not just Parmenides' pupil but his adopted son and his lover. He was a tall and handsome man, Plato says; and Diogenes says that his books 'are brimful of intellect'. Aristotle said that Zeno invented 'dialectic', the form of philosophical argument aimed at arriving at truth (as opposed to 'eristic', argument conducted merely for the sake of argument or for point-scoring), in part by starting from the views of an opponent and demonstrating that they lead to unacceptable conclusions.

Diogenes says Zeno was a man of 'noble character, both as a philosopher and as a politician', for when his attempt to overthrow the tyrant Nearchus failed he was arrested and tortured before being killed, but did not betray his friends.[fn7] His death produced a multiplicity of legends. Saying to Nearchus that he had something private to whisper in his ear, Zeno 'laid hold of it [the ear] with his teeth, and did not let go until stabbed to death'. Another version says it was the tyrant's nose, not his ear, that he bit off. A third says that he bit off his own tongue and spat it at the tyrant rather than reveal any secrets, and this so roused the citizens that they stoned the tyrant to death. When Nearchus told him to reveal who was behind the coup attempt, Zeno said, 'You, the curse of the city!' whereupon Nearchus had him thrown into a giant mortar and pounded to death.

One might think these picturesquely gory details are intended to enliven what anyone would think is the otherwise staid tale of people whose greatest excitement consists in thinking; but in fact philosophers have had a lively time, as their biographical details often show – for ideas can be dangerous things, demanding courage to express them or live by them. Diogenes wrote a tribute to Zeno as follows: 'You wished, Zeno, and noble was your wish, to slay the tyrant and set Elea free from bondage. But you were crushed; for, as all know, the tyrant caught you and beat you in a mortar. But what is this that I say? It was your body that he beat, not you.'

In Plato's *Parmenides* Zeno is reported as saying that his arguments about the impossibility of motion and plurality are offered as a defence of the Parmenidean

thesis that reality is One and unchanging: '[my arguments are] a defence of Parmenides' argument against those who try to make fun of it, saying that if What Is is One, the argument has many ridiculous consequences which contradict it. Now my treatise opposes the advocates of plurality and pays them back the same and more, aiming to prove that their hypothesis "that there are many things" suffers still more ridiculous consequences than the hypothesis that there is One.' In other words, Zeno's arguments have the form of a *reductio ad absurdum* of an initial hypothesis, by showing that contradictions can be deduced from it.

Zeno created about forty paradoxes, of which ten are known. Aristotle's *Physics* is the chief source for Zeno's arguments against motion. They can be described as follows. Suppose you are walking from one end of a stadium to the other. To do this you must get to the halfway point. But to get there, you have to get to the place halfway to the halfway point. Indeed to get to any point you have to get halfway to it, but first you have to get halfway to that halfway, and before that halfway – and so on ad infinitum. But one cannot traverse an infinite number of points in a finite time; therefore motion is an illusion.

Again, consider Achilles racing a tortoise. If the tortoise is given a head start, however small, Achilles can never overtake it. For to do so he must reach the point from which the tortoise started; but by the time he does so, the tortoise will have moved on, and Achilles must therefore reach that next point. But by the time he does so ... and so on.

A third argument is this. Consider an arrow fired at a target. At any point in its flight the arrow occupies exactly the space that is its length. It is therefore motionless in that space, for (says Zeno) all things are at rest when occupying a space equal to their own size. But then because the arrow occupies its own exact space at every point on its flight, it is motionless at every point in its flight.

Some answers are suggested by Aristotle himself. Zeno's argument assumes that it is impossible to traverse an infinite number of points in a finite time. But this is to fail to distinguish infinite divisibility and infinite extension. One cannot traverse an infinite extension in a finite time, but one can an infinitely divisible space, for time itself is infinitely divisible; so one is traversing an infinitely divisible space in an infinitely divisible time.

As to the arrow argument: Aristotle says that it depends on the assumption 'that time is composed of "nows" [that is, discrete intervals]. If this is not conceded, the deduction will not go through.'

Zeno's arguments are so framed as to suggest that he principally had the Pythagoreans in mind. In arguing that number is the basis of reality they correlatively held that things are sums of units. Zeno is reported to have said, 'If anyone can explain to me what a unit is, I can say what things are.' He here offers a classic case of deducing a contradiction from the premise 'that there are many things', as follows: 'If things are a many [a plurality], they must be just as many as they are, and neither more nor less. Now, if they are as many as they are, they will be finite in number. But: if things are a many, they will be infinite in number, for there will always be other things between them, and others again between those. And so things are infinite in number.'

Another argument against plurality turns on the supposition that things can be divided into parts. You have to assume that the parts themselves have to be something, because if the divisions of things finally reach nothing, how can something be composed out of nothing? Suppose you argue that the parts are not nothing, but have no size; how then can the thing they compose have size, given that no number of things without size can constitute a thing with size? So you are left with the

assumption that the elements of things have to be something, and with a size. But then they are not the elements of things, because they can be further divided, and if their parts in turn have size they are therefore divisible, and their parts likewise – and so on; so the dividings can never stop.

The Pythagoreans also appear to be the target in Zeno's argument against space, given their doctrine about air coming into the cosmos from outside the cosmos. 'If there is space, it will be in something, for all that is, is in something, and what is in something is in space. So space will be in space, and this goes on ad infinitum; therefore there is no space.' Leaving aside the assumption that space is regarded as a container in something like Newton's sense of absolute space, rather than (say) a set of relationships between objects, and whether there are fallacies of equivocation (that is, multiple senses in the same word) in the words 'something' and 'in', there is the question why the concept of infinite space should be intrinsically incoherent, as Zeno assumes.

This raises the question of Zeno's deployment of the concept of infinity. What has come to be called 'the standard solution' to Zeno's paradoxes of motion invokes calculus, invented independently by Newton and Leibniz in the seventeenth century, and his talk of infinity prompts discussions about actual and potential infinities, the concept of the former only receiving a full formal defence in the work of the mathematicians Richard Dedekind and Georg Cantor at the turn of the twentieth century. Ideas variously to the effect that the elements of physical reality cannot be infinitely divisible, that the notion of space, or of perceived reality as a whole, is contradictory, that there is a need to construct paraconsistent logics in which both arms of contradictions can be held to be true, are just some of the outcomes that reflection on Zeno's paradoxes has prompted.

One relevant consideration for paradoxes such as the 'Stadium' and 'Achilles' is that if you sum ½ + ¼ + ⅛ ... you get 1 for intervals of both space and time. So if you sum the distances that one must traverse to get to each halfway point (halfway across the stadium, halfway to that halfway point, and so on) you get the finite distance between the two ends of the stadium. The same applies to the time that elapses for each successive act of getting to a given point, then to a next given point, and so on. Once again, the conclusion is that one can traverse an infinitely divisible space in a finite time.

A suggestive result of reflection on the paradoxes is that they arise from conflicts between the conceptual conveniences we put to work to organize our experience. For example: when we are thinking of motion as a continuous event that occurs over an interval of time, we are thinking of an object travelling from one position to another against a background of fixed reference points, and from this perspective we do not, and arguably cannot, think of the object as being successively and determinately at given points in space different from immediately neighbouring points at discrete instants of time. But when we think of the object from this second and different perspective, namely the perspective of it being at a given point in its journey, we do not and arguably cannot think of it in the way we think of it from the first perspective, that is, as passing through that point in a way unspecifiable as 'a place at a time', given that this is exactly what we are doing from the second perspective. The problem therefore lies in us; sometimes our ways of describing the same things for different purposes from different perspectives are inconsistent with each other. This does not entail that motion itself is illusory.

Whatever the merits of Zeno's arguments individually, and however well the counterarguments to them fare, the fact is that they further provoke reflection on the

Parmenidean idea that so influenced Plato and a great deal of subsequent philosophy: the idea, namely, that appearance is not reality.

EMPEDOCLES

Like Parmenides, Empedocles was born to a wealthy and influential family, and played a part in the politics of the city of his birth, Acragas in Sicily. Although he was an aristocrat he favoured the democratic party, but apparently kept his aristocratic ways, dressing flamboyantly, claiming to have superior talents and disdaining modesty about them: 'I go among you, an immortal god, no longer mortal, honoured by you all, wreathed in garlands and crowns.' He might have earned some at least of this reputation because, as a physician, he had performed some notable medical feats, saving another Sicilian city, Selinus, from the plague, and allegedly engaging in sorcery and magical acts. Among his powers he claimed to be able to control the winds and storms, to reverse old age and to avert evil. 'To whatever famous town I go,' he wrote, 'I am praised by men and women, and accompanied by thousands, who thirst for deliverance, some asking for prophecies, and some to be cured from all kinds of diseases.'

His reputation as a medical man seems to have been based on more than pretensions to magic. Galen describes him as the founder of the Italian school of medicine, equal in importance to other medical traditions of the time. His school taught that illness results from imbalance of heat, cold, dampness and dryness, these properties in different combinations being associated with the four elements he identified as the basis of all things: fire, air, water and earth. Some of the school's doctrines seem perceptive, as for example that respiration occurs through all the body's pores and not just the lungs, and is connected with the movement of the blood. In other respects they bear the marks of more primitive thought, for example locating the seat of consciousness in the heart.

The proximity of his home city to both Croton and Elea makes it very plausible that, as he is said to have done, Empedocles studied with both Parmenides – indeed, as a fellow-student of Zeno's – and the Pythagoreans. One story has it that he was indeed a Pythagorean but was expelled by the order for stealing some discourses. The claim that he was for at least a time a Pythagorean, and certainly influenced by that school, is supported by his vegetarianism and belief in metempsychosis.

Empedocles wrote in verse, as Parmenides had done, and was the last of the Greek philosophers to do so. There was not another great philosophical poem until *De Rerum Natura* by Lucretius in the first century BCE. Far more of Empedocles' writings survive than those of any other Presocratic; on one estimate about a fifth of the lines from his poem *On Nature* are known. Among his other poems was one called *Purifications*, and he is said to have written an account of the invasion of Greece by Xerxes, a hymn to Apollo, a treatise on medicine, and plays. What is understood about his views has been influenced by the twentieth-century discovery of a papyrus – the Strasbourg Papyrus – containing lines by him, suggesting an alternative arrangement of their order which hints at different ways of interpreting his views.

Empedocles' cosmology is premised on the idea that there are four eternal and indestructible elements, or 'roots' as he called them, from the combinations of which all things arise. He was the first to introduce this fourfold *arche*. He said that things are mixtures of the four roots in different proportions, and change is the process of the four roots combining and separating when acted upon by one or other of two motive powers which he called 'Love' and 'Strife' respectively. These powers fluctuate in

strength relative to one another, which explains how first one then the other can result in the aggregation and then segregation of things.

The cosmos is eternal, and passes through cycles determined by whether it is Love or Strife that has the overall upper hand. In its best state the cosmos is inert, the two powers at rest and the four roots in unmixed separate equilibrium. It is a sphere, held together by Love, with Strife guarding the outer periphery. The notion of a still, inert sphere is Parmenidean in inspiration, but Empedocles' sphere does not long remain in stasis, for Strife begins to wax in power, pulling at the bonds forged by Love and thus initiating a tug of war between them from which arises the plurality of things. As Strife's power grows ever greater the struggle eventually plunges the cosmos into chaos. No life can exist in this part of its cycle. But then Love's power starts to wax in its turn, and the cosmos passes through another phase of tug of war in which things arise out of the mixtures of the elements. Finally Love's victory brings the cycle to another resting point of inertness; and the cycle begins again.

An intriguing aspect of Empedocles' theory is his view that the combinations of elements are random, producing a multiplicity of weird things such as animals' heads on human bodies, shoulders without arms, hermaphrodites and other such malformations, which disappear as quickly as they appear because only the well-adapted ones survive and reproduce themselves.

He thought that we see by emitting streams of light from our eyes that illuminate the objects we look at, and that the whole surface of our skin is a sensory organ receptive to the effluences given off by things around us, with the combinations of elements constituting us responding to the combinations of elements in things outside us, so that we know them because of our similarity to them.

He had learned from Parmenides to think of the senses as delusive, and therefore argued that we must apply reason in order to grasp the nature of things from all perspectives. From the Pythagoreans he took the doctrine of metempsychosis, and thought with them that the acquisition of knowledge so purifies the soul that it can escape the cycle of rebirth.

Empedocles' death is surrounded by anecdote, the best known of which is that he leaped into Etna in order to disappear completely, so that people might think he had been assumed into heaven without dying, thus confirming his divine status; but that his ploy was found out because the boiling lava ejected one his famous golden sandals on to the lip of the crater. Variations of this story exist, jointly prompting the couplet, 'Great Empedocles, that ardent soul, / Leapt into Etna, and was roasted whole.' A more sober alternative, also recounted by Diogenes Laertius, is that he broke a thigh when old, died soon afterwards and was buried in Megara where his tomb was known in antiquity.

Reflection on Empedocles' views, as with those of other Presocratics, shows in what ways they are not as fanciful as they at first seem. The four 'roots' identified by Empedocles – earth, air, fire and water – can be seen as embodying or representing the forms in which physical things exist, as solids, liquids or gases and as combinations of these. Aristotle says that Empedocles intended us to understand that fire stands in a particular relation to the other three, as acting upon them in the course of their Love- and Strife-driven interactions. His inclusion of air, which he called *aither* rather than *aer* in order to distinguish his own from Anaximenes' view, was based on the discovery that air is an actual physical substance. It is said that he showed this experimentally by means of a clepsydra or water clock, by putting his thumb over the spout, inverting it and submerging it in water, then removing his thumb so that the trapped air bubbled out, thus demonstrating its real existence to those who had been waving their hands in

as an infinite mind would do; unless he means that it is 'acquainted' in the sense of 'in contact with' all things.

Aristotle's criticism of Anaxagoras' conception of *nous* is that it is merely an expedient filler of explanatory gaps: 'Whenever he is at a loss to explain why anything necessarily is, he drags it in.' The concept works rather like 'the god of the gaps' argument, invoking a deity at any opportunity to explain what seems inexplicable. It is certainly hard to find a justification in the fragments for how *nous* imparts a 'rotary motion' to the initial mixture of things, thereby causing separation of cold from hot, rare from dense, dry from wet, and so on – though never completely; the dry always has a little wet in it, the hot always a little cold, and vice versa. Eventually the swirl of separation produces two separate masses, one with a preponderance of the hot, light, dry and rare elements, the other with a preponderance of the cold, dark, wet and dense elements. The first is *aether* or fire, the second is air.

Because it has a preponderance of rare over dense, aether constitutes the 'outside' and air, being more dense, constitutes the 'inside' of the world. Air then aggregates into clouds, water and earth, and earth into stones. There are many worlds, one fragment suggests; and if this is what Anaxagoras meant he is in conformity with the Ionian tradition before him on this point. He thought the earth is flat, and rides on air; earthquakes result from turbulence in the air under the earth. He said that rivers get their water from rain and the oceans get their water from rivers, though the Nile gets its water from snows melting in Ethiopia. The stars are stones that were torn from earth and made red-hot by the speed of their flight, but we do not feel their heat because they are too far away. They, along with the sun and moon which are also hot stones, are carried by the rotary motion of the aether. The sun is – more accurately, feels – hotter than the stars because it is not so far up. It is bigger than the Peloponnese, and its light is reflected from the moon as moonlight. Lunar eclipses occur when the moon passes into the shadow cast by the earth when it is between the sun and moon.

Much of this is very astute. Anaxagoras must have had exceptionally clear eyesight, for he said that the moon, which is the same as the earth in physical composition, has plains and valleys in it. But he was perceptive in other ways too; he said that plants are living creatures, and they and animals of course come from the same original *panspermia* or seeds of things, differing only by the admixtures within them. His theory of perception is that we sense things 'by opposites', as when I sense that the same bowl of water is cool if my hand is hot, but warm if my hand is cool. The image on the pupil of the eye has to be a different colour from the pupil in order to be seen. We see less well at night because things then have colours closer to the colour of the eye's pupil.

Anaxagoras is an interesting case-study in the Presocratic moment of philosophy, because in his theory the combination of *a priori* reasoning and inductions from observation, typical enough not just of philosophy's beginnings but of its entire history, manifests itself in clear outline. What he says about the source of river water, eclipses of the moon and some of the phenomena of sensory perception interestingly anticipates not just later views but the possibility of empirical verification of them. What he accepts from Parmenides about how reality has to be – namely, eternal and unchanging in its fundamental nature – and how he solves the problem this raises – how therefore can there be change, growth and decay? – is a paradigm of philosophy's early grappling with the question of appearance and reality – the perennial problem. His approach to these questions is a paradigm in another way too: of reason operating on observation, when these are the only available instruments of enquiry.

It is not clear whether the idea of 'seeds' in Anaxagoras' theory had any influence on the atomism of Democritus and Leucippus, but there is at least a superficial similarity in the basic conception.

Atomism is the theory that everything is composed of tiny imperceptible objects each of which is 'uncuttable' (*atomos* means 'uncuttable' or 'indivisible'). It was the chief competitor to the systems, different in other respects but alike in not being mechanistic, put forward by Plato and Aristotle. The atomism of Leucippus and Democritus appears to deal so well with the problems bequeathed by Parmenides and addressed by the other post-Parmenidean Presocratics that Aristotle, impressed even though he disagreed, felt obliged to study atomism in great detail. He therefore wrote a work in several volumes on Democritus – alas, lost save for a few fragments quoted by Simplicius.[fn8]

Hardly anything is known about Leucippus, and it is even possible that he did not exist – indeed Epicurus, whom we meet later, denied that he did. Other doxographers variously say that he was born at Miletus in Ionia or Elea in Italy – that is, on one or other extremity of the Greek world, which suggests that this is evidence not so much about where he was born as about the combination of Ionian and Eleatic elements in the philosophy attributed to him. Yet other traditions say that he was born in Abdera in Thrace, on the northern extremity of the Greek world; this is where his pupil Democritus hailed from.

Assuming that Leucippus existed, and he probably did, the books attributed to him, *On Mind* and *The Great World System* ('Macrocosmos'), were written some time about 440–430 BCE. He was therefore a contemporary of Empedocles and Anaxagoras, and like theirs his thinking was shaped in response to Parmenides. Democritus was born about 460 BCE, and he was reputed to have lived until he was a hundred years old. That means he was not only a contemporary of Socrates and Plato, but was still alive when Aristotle was studying with Plato. He was a great traveller, leaving among his many books accounts of his journeys around the ancient world, even to India according to some doxographers. Indeed he was a very prolific author, for in addition to his philosophical works, which ranged over metaphysics, ethics, mathematics and natural science, he also wrote on farming, art, medicine, grammar, literature and military matters. Some more recent commentators think that many of these books might have been written by his pupils in Abdera; rather as with the treatises attributed to Hippocrates, they would thus be the productions of a school, not of an individual. In any case one of the philosophical works more securely attributed to him was entitled *The Little World System* ('Microcosmos'), a tribute to his teacher Leucippus.

The works of Democritus are among the lost treasures of the ancient world, surviving only as quotations and *testimonia* as in the case of so many others. But there is an added consideration here, which is that most of the quotations and reports are from Aristotle and the commentators on Aristotle, which means that we see atomism through the eyes of its opponents.

The nub of the atomic theory is that there is an infinite number of uncuttable, indivisible, fundamental entities which are eternal and unchangeable in every respect but position. Their eternal and immutable nature makes them satisfy the Parmenidean requirement for reality. In addition to them there is 'the void', nothingness – but nothingness is real, contrary to Parmenides' claim that there cannot be nothingness. The void is like space in that it separates the atoms, which are therefore able to move in the void, and to bump into one another; the idea is that their various shapes make it

possible for them to link together into larger agglomerations, and for the agglomerations to break apart again later, thus giving rise to all the phenomena of things and their changes in the sensible world. This captures the idea, found also in Empedocles and Anaxagoras, that 'coming-to-be' and 'passing-away' are just changes, not actual creations and destructions of what exists.

The atomists called atoms 'What Is' and the void 'What Is Not'. Aristotle in the *Metaphysics* describes the atomists' account of how atoms constitute things as follows: 'They declare that the differences [between atoms, 'What Is'] are three: shape, arrangement and position. They say that What Is differs only in "rhythm", "touching" and "turning" – "rhythm" is shape, "touching" is arrangement, and "turning" is position. Thus A differs from N in shape, AN from NA in arrangement, and Z from N in position.' And he then adds, 'Concerning the origin and manner of motion in existing things, these men also, like all the others, lazily neglect to give an explanation.'

The most authoritative account of the atomic theory occurs in a long quotation Simplicius gives from Aristotle's book on Democritus, where he writes:

> Democritus believes that the nature of the eternal things is small substances which are infinite in number. As a place for these he hypothesizes something else which is infinite in size, and he calls it 'the void', 'nothing', 'the unlimited'. The substances he calls 'thing' and 'the compact' and 'What Is'. They have all kinds of forms and shapes and differences in size. Out of these elements he generates perceptible bodies. They are at odds with one another and move in the void because of their dissimilarity and other differences, and as they move they strike against one another and become entangled ... the bodies fit together and hold each other fast. For some of them are rough, some are hooked, others concave, and others convex, while yet others have innumerable other differences. So he thinks that they cling to each other and stay together until some stronger necessity comes along from the environment and shakes them and scatters them.

Note that in this account Aristotle reports an explanation offered by the atomists for motion: that the atoms 'move in the void because of their dissimilarity and other differences'. Theophrastus reports that Leucippus had said that one could infer, from the unceasing change and motion of the things we experience, that their parts must be in unceasing activity too. So they were not so lazy on that point, as Aristotle had complained, but instead offered a naturalistic theory which dispensed with appeals to metaphors of 'Love' and 'Strife' and 'Justice' as putative explanations of motion and change.

As regards an 'explanation of the origin ... of existing things' two comments might be offered. Atomism certainly offers an explanation of sensible phenomena, this being the combinings and separations of the atoms. In this sense the atomists do what the Ionian Presocratics previously did, which is to say how the *arche* gives rise to, or constitutes, the world we experience. By contrast, it is hard to find in Parmenides an account of why the world *seems* to us as it does, as a plural and changing realm, other than by just saying our senses are 'deceitful'. Aristotle of course meant that the atomists did not offer an account of how atoms and the void come into being in the first place; but then neither does anyone else say how reality, or whatever *arche* they nominate, comes to be.

But what is interesting about the atomists' response to the Parmenidean challenge – namely, that anything real must be eternal and unchanging – is that it both accepts it and defends pluralism. The Parmenidean argument was that, if there were many things, each must have the same character as the One; and the atomists in effect said,

'Fine; but why can't there be infinitely many things with the metaphysical properties of what the Eleatics call the One?' On the question of infinite divisibility they rebutted Zeno's argument in effect by accepting it; Zeno had said that it is incoherent to assume infinite divisibility, and the atomists said, 'We agree, which is why we argue that the atoms are, as the name implies, not divisible infinitely or otherwise.'

As with their predecessors the atomists offered views about the heavenly bodies, perception, and the contrast between what Democritus called 'true-born' and 'bastard' knowledge. Whereas the cosmologies of the ancients can illuminate the metaphysical and epistemological views that underwrite them, they otherwise have, in the main, historical interest only, and this might be said also of the atomists' account of the sun, moon and stars, and of the 'vortex' in which (oddly, given that in centrifugal systems the heaviest objects are flung the furthest) heavier bodies lie at the centre of the cosmos. Theophrastus is the chief source for what the atomists say on these matters.

Along with the philosophies of Plato and Aristotle, atomism is the most influential of the ancient philosophies. It was the inspiration for Epicurus later, and through him of the Latin metaphysical poem *De Rerum Natura* by Lucretius, and eventually of the science of the modern world in the ideas of Gassendi and the seventeenth-century 'corpuscularians' ('corpuscle' is in effect another word for 'atom' though it means 'little body' rather than 'uncuttable thing'). These views have been praised as a high point in Presocratic philosophy by such scholars as Jonathan Barnes, who describes atomism as 'the culmination of early Greek thought', and Theodor Gomperz, who said it was 'The ripe fruit on the tree of the old Ionic doctrine of matter'. As just noted, however, this Ionic fruit was served by the atomists in an Eleatic dish; hence its greatly enhanced intellectual piquancy.

THE SOPHISTS

In the original meaning of the word, a 'sophist' was an educated person with expertise in one or more fields of learning (*sophos* means 'clever', 'skilful', 'wise'). By the fifth century BCE 'sophist' had come to designate something more specific than this: a person who made a profession – and earned a living thereby – out of offering to teach the techniques of rhetoric and oratory. Being good at public speaking was a highly prized skill in the cities of classical Greece, still largely an oral culture and certainly one where the reputations and status of individuals turned in significant part on the showing they made in public debates – in advocacy, by eloquence, persuasiveness and power of command over an audience. Because this was such a desirable skill, sophists made a good living teaching it. It was at a particular premium in the Athenian democracy of the fifth century, where political and legal debate lay at the centre of the city's life.

Socrates and Plato disliked the sophists on the grounds that they offered to teach, in exchange for money, the ability to persuade others to any point of view, which meant that they taught people how to win arguments, not how to discover truth. In the *Euthydemus* Plato gives examples of the tricks that sophists offered to teach anyone wishing to beat opponents in debate. No doubt this was indeed what many sophists did, and because Socrates and Plato were critical of them the word 'sophist' now has a pejorative connotation. We talk of a tricksy argument as 'sophistical', the act of bamboozling others is called 'sophistry', and the word 'sophisticated' – though now used to describe a refined taste, superlative elegance, and the like – in its original meaning implies anything deliberately made complicated and bewildering in order to mislead others.

This denigratory view of the sophists is, although no doubt more justified than not, at the same time not entirely fair. In addition to teaching rhetoric and oratory the sophists also taught what was required to accompany an ability to be a good public speaker, for there is no use in being eloquent if you have nothing to be eloquent about – if you know no history or literature, if you know nothing about ideas, if you have never reflected on right and wrong, the state of society and how to live a successful life. Greek society had in general become more literate, wealthy and advanced in the fifth century BCE, and the desire for an education beyond the traditional basics of arithmetic, literacy and gymnastics had greatly increased. The theories of philosophers, and an interest in geography, history and other societies and cultures, fuelled the appetite for rational discussion and intelligent debate. The sophists accordingly were educators in more than just rhetoric, and part of what they offered to teach was a 'philosophy of life' or ethic. This aspect of what they did drew the particular attention of Socrates, whose own primary interest was the question of what constitutes a genuinely good life, and he therefore engaged with and challenged others, not least the sophists, to explain and justify their views on this matter.

Although they are bracketed together, the sophists were not a school and did not have a joint outlook or doctrine. They were individual teachers, travelling professors, even performers in that they gave displays of rhetoric also. They were not inclined to hide their lights under bushels, it seems, as we learn from Plato's account of the most famous of them: Protagoras, a native of Abdera where Democritus hailed from.

Protagoras lived between 490 and 420 BCE, and was one of Pericles' associates while the great statesman was alive. Plato gives a compelling portrait of him, having him say, 'My boy, if you associate with me, the result will be that the very day you begin you will return home a better person and the same will happen the next day too. Each day you will make progress.' Moreover, Protagoras claimed, the pupil will become stocked with good counsel, so that he can effectively manage both his household affairs and the affairs of the city; and he will be 'powerful in acting and in speaking'.

Other quotations from Protagoras, reported by Stobaeus, pseudo-Plutarch and others, suggest that he was no mere blusterer. He said that learning must begin early, that it must sink deep roots to be effective and that it requires much practice and dedication: 'Art without practice and practice without art are nothing.' But he also gave reason for Plato's antipathy towards him: he disliked mathematics – 'the subject matter is unknowable and the terminology distasteful' – and he is credited with being the first to state the view that 'there are two mutually opposed arguments on any subject,' one of the reasons invoked by later sceptics to deny the possibility of knowledge. It was on this basis that he also said that one could successfully argue either side of the same case: as one doxographer put it, 'Protagoras made the weaker the stronger argument and taught his students to blame and praise the same person.'

Plato puts a speech into Protagoras' mouth in which, after agreeing with Socrates that what should be taught is how to run a city and make good citizens, he sets out his view that good citizenship consists in the practice of justice and self-restraint. He says that these are natural propensities which education can and should foster in people, because they conduce to the preservation of good order in society, and therefore to the survival of its members. These views are unexceptionable.

But in the *Theaetetus* Plato reports another and more controversial of Protagoras' views, that 'man is the measure of all things, of things that are, that they are, and of things that are not that they are not,' which is said to be the opening sentence of his lost book *Truth*. This seems to be a statement of relativism, implying that there is no objective truth, but that what is true for one person might not be true for another,

order, on the level of the beasts, subject to force; there was no reward for the good or punishment for the bad. Then people established laws as punishers, so that justice could be the mighty ruler of all equally, and make violence its slave.' For him, as for Hobbes many centuries later, the state of nature was the source not of good but of ill, and it took the application of reason to bring justice into the world.

From the viewpoint of subsequent history, the antipathy felt by Plato for the sophists is highly consequential. The key point for Socrates and Plato is that philosophy is the pursuit of truth, and it cannot be constrained by the necessity of winning a case or earning a fee. In our own day we are rightly sceptical of expressions of opinion that have been paid for – 'sponsored editorials' in newspapers, pharmaceutical companies paying doctors to prescribe certain drugs, politicians acting on behalf of donors, and the like. The point that Socrates and Plato insisted on holds: that truth should not be for sale.

Socrates

'Socrates' is a character in Plato's dialogues, portrayed as the paradigm of the philosopher, disinterestedly pursuing truth, keen to promote clear thought, deep understanding and knowledge of virtue. He is portrayed as loved and admired by his friends and the young, as kindly and witty, and as ferociously clever.

But 'Socrates' is also the name of a real human being, and the great question – the 'Socratic question' – is how far Plato's dialogues actually represent the historical Socrates. There can be little doubt that the 'Socratic method' – the method of questioning, dialogue and cross-examination – was indeed Socrates' way, and there is no doubt that his chief, indeed almost exclusive, interest was ethics. But how much of the philosophy in Plato's dialogues is Socrates' philosophy, and how much is Plato's? The probable answer is that Plato's early dialogues are, to a fairly large extent, representative of the historical Socrates, but by the middle dialogues 'Socrates' has become a literary device for the exposition of Plato's own views.

Socrates was born in Athens around 470 BCE, and died there, in prison, in 399 BCE, having been condemned to death for 'impiety and corrupting the youth of Athens'. Although given every opportunity to escape, he chose to obey the law; he had been found guilty and condemned to death, so he dutifully drank the hemlock, and died as his fellow-citizens said he should.

The chief sources of our knowledge of Socrates are Plato's writings and to a lesser extent those of another of his pupils, Xenophon, though their accounts of him differ somewhat. For example, Plato (an urbanite) says that Socrates liked the town and disliked the country, whereas Xenophon (who loved the country) says the reverse. There are also reports of him in Antisthenes, Aristippus and Aeschines. He figures as the butt of jokes in Aristophanes' comedy *The Clouds* and in half a dozen other satirical plays.

He was consistent in his principles, showing courage in battle and dedication to his mission to persuade his fellows to think seriously about the nature of the good and worthwhile life. The famous or infamous Alcibiades, a handsome statesman and general who was at last the downfall of his own city of Athens, claimed to be in love with Socrates and to have tried unsuccessfully to seduce him. Although Socrates was married – to Xantippe, unkindly alleged to be a 'shrew' – he was not without an interest in beautiful boys, an acceptable proclivity in his day; in the *Charmides* he confesses to being flustered by the charms of the handsome boy of that name, but wished to talk to him to find out if he had that thing which is greater than physical beauty, namely, a noble soul.

A famous story has it that when a man called Chaerephon asked the oracle at Delphi who was the wisest man living, the oracle said 'Socrates'; and that Socrates was astonished to learn of this, until he realized that it was doubtless because he knew that he knew nothing. He did however see himself as a 'gadfly' stinging his fellows into reflection on questions about virtue and the best kind of life.

There are no reports of Socrates having written anything, though he is said to have co-authored or anyway contributed to some of the plays of his friend Euripides. As noted, it is plausible to think that the early dialogues of Plato give a fairly accurate picture of the real Socrates in both manner and opinions, but that by the middle and later dialogues Plato's own philosophy comes to the fore and the 'Socrates' who appears in them is his mouthpiece – and in some cases not a leader of the discussion but merely a participant; and indeed occasionally a defeated one, as in the *Parmenides*.

Perhaps the most accurate portrait of Socrates occurs in the *Apology*, which is the speech given by Socrates in his own defence at his trial. That this work accurately reports his speech in all main respects is very likely, given that its contents would have been public knowledge, and still in the memories of many when Plato published it. Moreover Plato says that he was present at Socrates' trial, a claim that could easily have been challenged by contemporaries were it untrue. If Plato had been prone to invent significant things he would almost certainly have claimed to be at Socrates' deathbed, but he reports that he was not there that day, because he was ill, and that he only learned at second-hand about the conversation between Socrates and other friends on that fatal day.[fn1] I think this further suggests that Plato was not in the close circle of Socrates' acquaintances – he would have been at Socrates' side on the day of his death had he been so, however ill. Socrates was a man in his seventies when he died, Plato in his twenties; the dramatic dates (so to speak) of many of Plato's dialogues predate his own birth; he never places himself among those present at those conversations. In short, the personal connection between them was likely the same as between a professor and the majority of university students who attend her classes. He was, however, an exceptionally gifted such student.

Taking it that the various accounts and caricatures of Socrates indicate something about the man Socrates, and that Plato's early dialogues give us some insight into the views and methods of Socrates the philosopher, one can venture an account of him as follows.[fn2]

Remember that the Athens of Socrates' lifetime was the Athens which had been triumphant as a leader of the Greek world in the war against Persia, and had become wealthy and powerful as a result. It was the Athens of Pericles, who had used the tribute from the states in Athens' new empire to adorn the city with beautiful temples and statuary and to sponsor the arts. In this high point of classical antiquity the great ideal was beauty, not least of the male form and face, and the social and political skills acquired by an education at the hands of leading sophists, skills that would lead to fame, honour, riches, influence and a high position in public service. Socrates was, in his person and manner of life, in effect a rejection of all this. He was famously ugly, with bulging eyes, a big snub nose and thick lips, a burly frame, an indifference to dress and personal cleanliness; and he had strange habits such as standing in a trance for entire days, lost in thought. He did not seek public honours or position, though he fought with notable courage alongside his fellows in the wars. He therefore stood out, an anomaly, an eccentric, all the more so for incessantly asking questions and confusing his interlocutors when they tried to answer them. One such, Meno in the dialogue named for him, after his several attempts at a definition of virtue have been refuted by Socrates, says to him, 'You are like a stingray, you have numbed my lips and tongue; I don't know what to say!' To which Socrates replies, 'Good! Now that you know that you don't know what you're talking about, we can begin to make progress!'

It was the Socrates of poverty and indifference to worldly things who was imitated by the Cynics later; it was the Socrates of dedication to thought and fidelity to principle who inspired the Stoics later; it was Socrates' preaching of the 'considered

life' which inspired Aristotle to see reason as the distinguishing characteristic of humanity, and practical wisdom (*phronesis*) as the basis of ethics. And of course it was Socrates whom Plato took as his point of departure for a philosophical achievement of enormous range and influence.

The first thing to note about Socrates as a philosopher is his method, the 'Socratic method', known as *elenchus* or 'refutation'. It proceeds thus: Socrates asks his interlocutor for a definition of an important ethical concept such as justice, continence or courage. He wants to be told what is the essence of (say) courage, that single fundamental thing that defines all courageous actions and people. He does not want examples, or lists of characteristics that some courageous acts or people might exemplify and that timid or cowardly acts or people do not exemplify. Then, when a definition is offered, Socrates demonstrates that other things held by the interlocutor to be true are inconsistent with that definition.

A good example of the method is to be found in the *Laches*. Laches was a general in the Athenian army who knew of Socrates' courage in battle (Socrates fought as a hoplite – a heavily armed infantryman – in the battle of Potidaea, and was in the army with Laches on the retreat from Delium). In a discussion between them about how to train young men as hoplites, the question of the nature of courage arose, and Socrates asked Laches to define it. Laches said, 'Courage is endurance of the soul,' by which he meant steadfastness. But Socrates soon shows him that not all forms of steadfastness are good – for example, when it is merely stubbornness, or foolish bravado, or when it is displayed by a doctor refusing a sick patient's request for water when water would be harmful. So 'steadfastness' cannot be the essence of courage.

Another participant in the discussion is Nicias, an associate of the sophist Prodicus, whose technique of 'pulling words apart' – that is, drawing fine semantic distinctions and logic-chopping with them – is criticized by Socrates in this dialogue. Nicias offers a different definition; that courage is a form of knowledge, namely, knowledge of the grounds of hope and fear. Laches objects to Nicias' definition on the grounds that it entails that we cannot call lions and other such animals courageous; to which Nicias in effect replies, 'No, indeed you can't call them courageous, though you can call them fearless: these are not the same thing. You cannot call them courageous any more than you would call a human baby courageous who put its hand in the fire; for it is not courage when you are ignorant of the possibilities.' This is a good point, and although Socrates says, 'He has got this ... from Prodicus, who of all sophists is considered the best puller-to-pieces of words,' he does not disagree with him about it. But he does disagree that 'knowledge of the grounds of hope and fear' is an adequate definition of courage, because (I paraphrase) 'hope and fear pertain to what lies in the future, but virtue applies to all times, and as courage is a virtue, it too must apply to all times, and not just to future possibilities. So, Nicias has given only a partial definition.'

And there, like all the early dialogues, the conversation ends: in *aporia*, inconclusiveness, no definition having been found. But at least the wrong or inadequate definitions have been exposed, and something has been learned along the way; namely, that one is ignorant about the true nature of X, whatever this happens to be, and that therefore one needs to think about it more.

Clarification, and awareness of one's ignorance, are good things. But if the method of *elenchus* is meant to lead to knowledge, it is not entirely satisfactory if it only ever produces knowledge of one's limitations. The central problem seems to be the Socratic quest for *essential* definitions. Does everything have an essence which can be captured in a definition? Is it not the case that some concepts apply when this or that subset of a larger group of characteristics applies, the subsets overlapping but not jointly and

exhaustively constituting the 'essence' of the thing? Consider: courage on the battlefield, in the dental chair, in taking an examination for the fifth time, in living cheerfully among the creaks and pains of old age, in getting up every morning despite grief or despair – is there one essence of all these manifestations of courage?

In any case, on what grounds is it right to say that one cannot know what courage is unless one can give a definition of its supposed essence? The 'I know it when I see it' response is a good one in many cases, and it might be that unless one in some sense had knowledge of a thing, one would not be able to acquire further knowledge of it – suggesting that knowledge in some degree precedes being able to grasp the essence of a thing, if it has an essence. Another version of this thought is to ask, Do we not ascend to knowledge in general of something – say, knowledge of dogs – by first knowing individual or particular instances of that thing: this individual dog and that individual dog?

As it happens, Aristotle said that this was indeed Socrates' method, an inductive method of moving from the particular to the general, or of inference by analogy from examples to the whole. If so, matters are less satisfactory still, given the intrinsic insecurity of inductive arguments.[fn3] But there is also the sense one has, especially in the earlier dialogues, that Socrates himself is not entirely unsophistical. Take for example Laches' attempted definition: when he nominated 'steadfastness' he of course intended that to mean 'in the face of challenge, difficulty, threat or danger'. Socrates 'refuted' him by taking cases of steadfastness where these are not at issue. The fallacy seems to be his, not Laches'; a form of fallacy of equivocation made possible by refusing to consider the qualifications that nail down a general concept to a set of specific applications.

Socrates said that when he was young he heard philosophers lecture about the nature of reality and the cosmos, yet (like the poet in the *Rubáiyát of Omar Khayyám* who 'evermore came out by the same door as in I went') was none the wiser for it because the different theories went round and round fruitlessly, and – worse still – ignored the truly great question, as he saw it: the question of how to live. His focus was *arete*, a word that means 'virtue' and 'excellence', and which he construed as 'moral excellence'. He saw the chief virtues as courage, justice, temperance and wisdom. Virtue itself, he said, is knowledge. He thought that if one knew the right thing to do or be, one could not do or be otherwise; vice is ignorance, and ignorance makes vice possible. This means that the good life is the life examined and chosen; the 'considered life'. Indeed he said, 'the unconsidered life is not worth living.' A considered life is a life based on knowledge of right and wrong. This is why, Socrates claimed, nobody ever does a bad thing knowingly or deliberately; to do a bad thing is harmful to oneself, and no one ever harms himself knowingly, by choice.

Noble as they are, these views do not bear much scrutiny, for they are not psychologically realistic. For one thing, they take no account of the possibility of *akrasia*, 'weakness of will', which is something most of us experience quite a lot of the time – think of the difficulties involved in dieting, giving up smoking, refusing temptation. Socrates in fact denies outright that there is such a thing as *akrasia*; he asks in Plato's *Protagoras*, 'How is it possible for someone to do something knowing it to be wrong?' The answer is – alas! – that it happens all the time. The proof is *ab esse ad posse*, 'from what is the case to what is possible'.

Socrates also believed in the unity of the virtues – that if a person has one of the virtues he has them all. But this too contradicts experience. An unjust person might be courageous, a just person timid. It is true that it seems improbable that an unwise person might be temperate – but then this raises the problem that wisdom and

that Plato became more seriously interested in the philosophical ideas he had hitherto been using as vehicles for his literary ambitions.

Although some of the philosophers of antiquity were pure theoreticians – ivory-tower academics, as might be said today – many were engaged in the practical and political lives of their city states. Plato did not take an active part in Athenian politics after Socrates' death, but he had a long-standing interest in the Greek city of Syracuse in Sicily, to which he was three times invited by its rulers to advise on its government. He accepted the invitations because he was friendly with Dion, who became ruler of Syracuse following a rebellion; Dion was a disciple and admirer of Plato, and he offered the philosopher a chance to put his ideas about government into practice. In the event Dion proved a poor ruler, and his period in office, during which he sought to establish a Platonic aristocracy, bequeathed a legacy of turmoil and failure that lasted for decades afterwards. To say that the fault lay with Plato's ideas and the advice he gave would only be partly true; the intractable materials of human nature and economic reality, and Dion's own failings, doubtless had parts to play that were as large or larger.

Plato's philosophy is a system, or at least it aspired to be one (he was too self-critical for the aspiration to be fully realizable). Its different components were meant to fit together to provide answers to the fundamental questions that he, more clearly and more comprehensively than his predecessors, saw had to be answered so that all the answers together make sense. Those questions are, What is the right kind of life, and the best kind of society? What is knowledge and how do we get it? What is the fundamental nature of reality? You might note that these questions have an order: to answer the first you need an answer to the second, and to answer the second you need an answer to the third.

Many philosophers after Plato likewise recognized that to answer the great questions of ethics one has to answer questions about the nature of the world and humanity in it, and therefore of how we can acquire knowledge about both. And that means we have to find answers to a number of sub-questions; for example, to understand knowledge and how to get it we have to have views about truth and reason, about the powers and therefore the nature of the mind, and about its relationship to the rest of reality.

Almost the whole of philosophy consists in approaches to the related set of questions addressed by Plato. It is because Plato identified them and the way they connect with each other that Alfred North Whitehead, a mathematician and philosopher who collaborated with Bertrand Russell on the *Principia Mathematica*, said that 'Philosophy is footnotes to Plato.' That is an exaggeration, but not too much of one, for indeed almost all the major questions of philosophy are addressed or at very least touched upon by Plato. In comparison not just to what went before in the history of philosophy, but to all that followed, Plato's achievement is vast – a mountain towering over foothills.

One way to enter Plato's philosophy is by noting the import of an analogy he uses to describe how things are for human beings, so far as their understanding of the world and life is concerned. This is the Allegory of the Cave in Book VII of the *Republic*. We are like prisoners held in a cave, chained so that we face the cave's back wall. Behind us, and between us and the tunnel that leads out of the cave, is a fire. Our captors walk up and down between our backs and the fire, casting shadows on the rear wall of the cave. We see the shadows. If we were released from our chains we would see the fire and the perambulating captors, and would therefore understand the source of the

shadows. But if we were allowed out of the cave and saw the daylight, and above all the sun, we would know things as they truly are.

Most people, says Plato, are like the prisoners watching shadows. Some attain to the level of understanding possible for a prisoner free enough to move about the cave. But the goal is to step into the sunlight, and to see the truth in its full glory.

How is it possible to do that? We get the first indications in the *Meno*, an important dialogue in that it marks the move away from Socratic *aporia* – inconclusiveness – with at best negative answers to the questions being addressed, and on towards Plato's provision of positive answers. Remember that Socrates had identified virtue with knowledge, and that therefore the question 'What is knowledge and how do we get it?' becomes crucial for understanding what the best life should be. So, how do we acquire knowledge? Plato had been persuaded by his philosophical predecessors, not least by Parmenides, that the senses are delusive and do not reveal to us the true nature of reality. Therefore to have knowledge we must have a means of acquiring it which is not dependent on the senses. At most and at best the senses can only give us *opinions* about the world they reveal to us – a world consisting of a plurality of transitory and imperfect things. Whatever else the objects of genuine knowledge must be, they cannot be like this; they must be eternal, perfect and unchanging, thus possessed of at least some of the essential characteristics Parmenides specified as essential to what truly exists.

To deal with this Plato put forward the following thesis. There are, he argued, two realms, the Realm of Being inhabited by perfect and unchanging things, and the Realm of Becoming, which is the world offered to us by our senses, the world of imperfect and temporary things, always changing (always becoming something else: hence the name). Things in the Realm of Becoming are imperfect copies of the things in the Realm of Being; these latter things are the Forms (also called Ideas) which are the exemplars and paradigms for the many imperfect and temporary copies of them in the Realm of Becoming. The Forms are eternal, perfect and unchanging; they are the 'real reality' of which the world of sense-experience is merely a shadow.

We are not capable of inferring the existence of the Forms from their imperfect copies, given our delusive powers of perception and our finite intellects; therefore there must be another way we know them. This is that we have immortal souls which, while in their disembodied state before we are born, occupy the Realm of Being and are in direct contact with the Forms – and therefore, while in that state, we know everything. But when our souls enter our bodies they forget everything. The process of education is the process of being (partially) reminded of what we knew in our disembodied state – literally, of 'unforgetting' what we knew when disembodied ('unforgetting' is literally what the word *anamnesis* means). This view is known in English as the 'theory of recollection'.

The theory of recollection is demonstrated in the *Meno* by the example of an ignorant slave boy from whom Socrates elicits a geometrical proof by 'reminding' him of what his immortal soul once knew. Critics point out that Socrates' questions are rather artfully phrased, and that any clever boy might have been able to construct the proof with their help. But the example is intended to show how knowledge of virtue can be gained – more accurately: regained – by such prompting. In the *Symposium* we are given an account of how this works: love of another's beauty can be a royal road to love of beauty itself and thence to intellectual love of the highest beauty of all, which is 'the Good'. In the Allegory of the Cave, the Good is represented by the sun.

In the *Meno* discussion several important ideas emerge. One concerns the difference between knowledge and true belief. Suppose someone believes that one can get to a

certain town by a certain route, and is right about it. Suppose he just happens to be right; he has never been there himself, but thinks he remembers someone saying that this is the route. So, he has a true belief about the route. But you cannot say he *knows* it, because his reason for believing it is not a good one. If he had been there himself, or had consulted an authoritative map, he could claim to know the route. Plato distinguishes between knowledge and a correct belief by saying that the latter becomes knowledge when it is 'tied down', that is, has a satisfactory justification.

Plato's theory requires acceptance of the view that we have souls, and that they are immortal. Arguments to this effect are presented in the *Phaedo*, a dialogue appropriately set in Socrates' prison cell shortly before he is due to drink the hemlock. Here the logical order of dependence between knowledge, the doctrine of the Forms and the doctrine of recollection is rearranged to make the fact that we know some things count as a reason for taking the soul to be immortal, given that we could not know those things otherwise.

There are two other arguments in the *Phaedo* for the soul's immortality. One is that the soul is like the Forms, that is, it is not a physical, empirical, structured thing, but an immaterial, single or unitary thing; and therefore like the Forms it must be eternal and indestructible. And of course it thereby satisfies, like them, the Parmenidean requirements for being *real*.

The 'Final Argument' is that the concept of the soul is incompatible with the concept of death. The soul is a thing of life; when death approaches it escapes, for otherwise its very nature would be negated.

These are not satisfactory arguments, and one notes that they turn in the first place on the assumption that there is such a thing as a soul. What, then, is a 'soul'? The *Phaedo* does not give a clear answer beyond assuming that it is distinct from the body and survives the body's death. At one point Plato lists many things that the body does, and says that by contrast the soul has just one activity, namely, reasoning. That seems odd, because if there were such things as souls it would seem plausible to ascribe the rest of mental life to them too, such as remembering, hoping, intending, desiring, and more. At another point, however, Plato appears to identify the soul with the personhood of its possessor; when Socrates is asked how he wants to be buried he says, in effect, '*I* am not my body; it is not *me* who will be buried.'

In Book IV of the *Republic* a somewhat more elaborate theory of the soul is advanced. Here Plato says that the soul has three parts: reason, spirit and appetite. With the first we learn, and pursue truth by rational enquiry; with the second we feel emotions such as anger or determination, and this is the part of us that seeks honour; while the third focuses upon such bodily desires as food, wine and sex.

In the *Phaedrus* Plato offers an account of the way we can sometimes be conflicted within ourselves because the different parts of the soul pull in different directions. He likens us to a flying chariot with a driver and two horses; the driver is reason, one of the horses is spirit, the other is appetite. Appetite tries to pull the chariot down to earth, while spirit seeks to obey reason's aim of taking it to the heavens. The charioteer has to struggle with the opposing forces thus represented. Plato gives more practical examples of this in the *Republic*, one of which is of a man who desires to fulfil a certain appetite but is angry with himself for having that appetite.

These are the main outlines of Plato's system. They are fully present in the best known of his works, the *Republic*. This is a dialogue about justice, and it uses the analogies that can be drawn between a person and a *polis* – a state – to illustrate the virtue of justice in each, justice being achieved when balance or harmony between the

aspects of the state is achieved, analogously with balance or harmony among the aspects of the soul.

Book I of the *Republic* is thought by some scholars to be an early Socratic dialogue of the familiar *elenchus–aporia* type, and the later books to be additions and expansions made by Plato as he developed a positive theory. This is because in the first book Socrates' interlocutors offer definitions of justice – one says 'it is the art of doing good to friends and harm to enemies,' and the other, Thrasymachus, says it is whatever the strong wish to do – and Socrates shows that they are each unsatisfactory. But then in Book II others take up consideration of Thrasymachus' point, variously arguing that justice arises from the social contracts put in place to protect the weak against the strong, and that unjust men will not be punished because they can use their injustices to grow rich enough to make pleasing sacrifices to the gods, who will therefore forgive them. This prompts Socrates to suggest that instead of seeking to define the just individual, they should see what is meant by justice in the state. In later books the ideas worked out for what would make an ideal state are applied to what would make a just person.

The main thesis of the *Republic* is that the ideal society would be one that is ruled by guardians or 'philosopher-kings', chosen when children for their intelligence and carefully and thoroughly raised so that, on reaching adulthood, they can fulfil the role of incorruptibly virtuous, dispassionate and wise rulers. This allows Socrates to take a detour into discussion of an ideal education. The chief idea is that children should be brought up by the state in ignorance of who their biological parents are. The state will decide which men and women should mate, on grounds of suitability; a form of eugenics. As the children grow up in state nurseries they will be separated into three groups: those suitable for training as guardians, those suitable for training as warriors (the 'auxiliary guardians'), and the rest. Both males and females can be guardians, and should receive the same training. They should be educated in the virtues of wisdom, temperance, justice and courage. They should be physically well trained in gymnastics to ensure good health. They should have no private property, so that there are no temptations to accumulate more, and wives should be shared to prevent partiality. They should live and eat with moderation.

Plato's ideal state is an aristocracy, a state ruled by 'the best'. The term 'aristocrat' did not then mean an hereditary social caste, but in fact is better understood as 'meritocrat', denoting the best of the citizens in respect of intellect and virtue. If the virtues are expressed by all degrees of citizens in the appropriate way, the state will be happy. The guardians will be wise, the auxiliaries courageous, everyone will be temperate and the government will be just. Harmony will prevail; and this is the key for the analogy between the state and the individual – for if harmony prevails likewise within the individual, he will be virtuous likewise.

In Book VIII Plato describes a set of political systems in order of merit, beginning with the kind he advocates and descending to the worst kind, namely tyranny. He regarded tyranny as the worst form of government, because, as Lord Acton long afterwards noted, 'Power tends to corrupt, and absolute power corrupts absolutely.' If power lies in the hands of a single individual, its arbitrary exercise can do great harm.

Between aristocracy as the ideal arrangement and tyranny as the worst, there are several intermediate forms. In the ideal arrangement the state is governed by the most knowledgeable, virtuous and wise of the citizens, whose rule is disinterested because, as noted, they have no vested interests in anything but the welfare of the state. The next best form is *epistocracy*, rule by those who know, in other words by experts. The difference between aristocracy and epistocracy is that in the ideal state the rulers are

not merely experts, they are *virtuous* experts; they have expertise in the nature of the Good as well as in government and other practical matters.

Plato wished his rulers to be virtuous and disinterested, with no ambitions other than to rule wisely, in order to prevent the state from degenerating into a *timocracy*. In modern parlance timocracy is rule by those who have a certain minimum of property, but in Plato's usage it denotes rule by those who seek honour, status and military glory. Ambition for these things reveals a mistaken confusion of the Good with its outer shows – wealth and reputation being erroneously regarded as the greatest goods worth having. Whereas aristocracy would ensure stable government because no inner divisions threaten it, with timocracy and the other less satisfactory forms of the state, rivalry enters the picture, and with rivalry comes instability.

Timocracy can easily become *oligarchy*, by which Plato meant rule by the rich over the more numerous poor (this form of oligarchy – rule by a few – is nowadays called *plutocracy*). Timocracy degenerates into oligarchy because timocrats are permitted to accumulate wealth, from which follow the vices encouraged by wealth: pursuit of pleasure and luxury, and belief that the accumulation of wealth is more important than virtue. Timocrats might care about honour, said Plato, but oligarchs care only about money.

And the inevitable result will be – *democracy*, for Plato a term of malediction. The rich enjoy freedom because their wealth buys it for them. Envy of that freedom causes oligarchy to be overcome by democracy. The populace, the *demos*, rises against the oligarchs in order to dispossess them, often with violence and turmoil. But when in democracy everyone claims the freedom and the right to make and break laws, what soon follows, said Plato, is anarchy, for such freedom is not freedom but merely licence.

Implicit in the idea of a declension from the ideal form of government is Plato's claim that the *demos* lacks the knowledge and virtue that philosopher-kings would have, and which is what makes them fit to govern. He thinks that the collapse of the democratic state into anarchy is inevitable given the supposed characteristics of the *polloi* or general public: ignorance, self-interest, prejudice, envy and rivalry. Anarchy very soon invites the intervention of a strongman to restore order; given the insupportable nature of anarchy, he will be welcomed at first with open arms. Once he is in power, removing him can be difficult, and the people will be in the worst situation of all: they will live under tyranny.

Just as the best state is ruled by wisdom and virtue, so the best kind of life is lived by the person who rules himself or herself by wisdom and virtue likewise. Plato's idea of justice is *balance* or harmony: balance between the three orders of people in the state, balance between the three parts of the soul in an individual. The different kinds of state have their analogies in different kinds of people – those ruled by wisdom and virtue, those driven by desire for honour, those driven by desire for wealth, those ruled by ignorance and unruly passions.

The *Republic* is something of a high point in Plato's philosophy, bringing together his metaphysics of the Forms, his epistemology of 'recollection' and his ethical conception of virtue as knowledge, into a system that provides a view of both the good individual and the good state. Other thinkers might have felt justifiably pleased with themselves for having worked out such an interlocking system and its comprehensive application to key questions. But Plato did not rest content. His thinking continued to develop after the *Republic*, and he came to challenge his own most significant ideas, both the theory of the Forms and his theory of knowledge. In doing so he took the philosophical examination of these matters to new levels.

have beliefs which are true but which we cannot claim as knowledge because our reasons for holding the belief are not the right ones to count as knowledge. This point recurs in the *Theaetetus*, and leads to the third theory, which is that knowledge is true judgment with a justification or account, a *logos*.

The effort to specify what kind of *logos* turns a belief into knowledge is inconclusive; Socrates ends by saying to the young Theaetetus, 'And so, Theaetetus, knowledge is neither sensation nor true opinion, nor yet definition and explanation accompanying and added to true opinion?' – a recurrence of *aporia*. But in exploring what the required *logos* might be, Plato initiates a long and detailed philosophical debate about the nature of knowledge which has lasted to our own day. For in our own day the definition of knowledge as 'justified true belief' – Plato's third option – still bedevils us with questions about the nature of that justification (to say nothing of questions about what 'truth' is).

There is a mystery attached to Plato in one respect, relating to the idea that he taught an 'unwritten doctrine', *agrapha dogmata*, that is, views that he did not commit to writing but kept privately within the circle of his pupils. Aristotle alludes to the existence of such views in his *Physics*, and many centuries later Plotinus, the founder of Neoplatonism, seems to have known them, or about them, or had surmises about what they were. Recent scholars of the Tübingen School of Platonic studies have attempted a reconstruction of them, saying that Plato 'reserved' his views (for his pupils) about the ultimate principles of things, of which there are two: that reality is One, and that it manifests itself through the action upon it of something called 'the Indefinite Dyad' which is variously the *large and the small*, the *lack and the excess*, the *ambiguous and the definite*, and so on – that is, opposites which act on the One and produce all reality from it as a result.

It is further suggested that the One is the Good – Aristotle reported that Plato lectured on 'the Good', and in the written doctrines the Form of the Good is nominated as the highest Form, so the identification would be plausible. But this, and indeed the entire speculation about an 'unwritten doctrine', is controversial. Aristotle speaks not of an 'unwritten doctrine' but of '*the so-called* unwritten doctrine'. Did he employ the phrase 'so-called' neutrally, or was he thereby casting cold water on the belief that there was such a thing? Yet in others of his writings, for example the *Metaphysics*, Aristotle refers to ideas of Plato that do not appear in the latter's texts. And one notes that Plato's immediate successors as heads of the Academy, first Speusippus and then Xenocrates, appear to have developed ideas about the One and a principle whose opposition to it generates reality; Speusippus talks of 'plurality' and Xenocrates of 'inequality'.

Was there an 'unwritten doctrine' and if so was it *esoteric* and kept within the circle of disciples because it was too precious to be made public? Some folk like that kind of suggestion; it gives a frisson, and a vague promise of deep dark secrets. Much more likely is the fact that what was discussed in Academy seminars ranged widely, and ideas were explored that did not happen to find their way into a written record, and that Plato advanced more thoughts than he found occasion to develop in a dialogue for publication. That would be wholly consistent with what has happened, and happens still, in philosophical discussions everywhere.

The school founded by Plato, the Academy, lasted nearly eight hundred years, until 529 CE. In that year the Roman emperor Justinian, a Christian, abolished it and banned the teaching of 'pagan' philosophy because it was inconsistent with Christian doctrine. But its long history before that saw a number of philosophically significant changes and developments. About eighty years after Plato's death the Academy fell under the

influence of scepticism when Arcesilaus (316–241 BCE) became its head, prompting Cicero to rename it 'the New Academy'. Historians of philosophy accept this label, and treat the sceptical phase as lasting until 90 BCE when Antiochus of Ascalon rejected the sceptical teaching he had received from Philo of Larissa at the Academy. Thus commenced 'Middle Platonism', a stage in which Plato's doctrines were modified by the introduction of elements of Aristotelian and Stoic thought. Middle Platonism lasted until Plotinus in the third century CE developed the Platonic tradition into the powerful school of thought that historians call Neoplatonism.

The immediate consequence of Plato, and one of the greatest legacies he bequeathed, must however be accounted his star pupil, Aristotle, whose disagreements with his teacher, combined with his own genius, constituted the next major step in the history of philosophy.

Aristotle

If Aristotle were alive today he would be a scientist, and most likely a biologist; he would have a lively interest in scientific method and logic, perhaps to the extent that he would have sympathized, even if he did not agree, with the attempt by the twentieth-century biologist J. H. Woodger to apply the logic of Russell and Whitehead's *Principia Mathematica* to the foundations of biology. As this suggests, Aristotle's genius was universal and synoptic: he wished to bring all knowledge into a great system.

Some contemporary scholars of Aristotle would not agree with that last remark; they regard him not as a systematic philosopher, but as an 'aporetic' one – that is, after the manner of the inconclusive explorations of Socrates ending in *aporia*, that he was an examiner of opinions, problems and puzzles thrown up by our experience of the world, often without coming to a settled view. But Aristotle himself seems to think differently about this, as we see from his introductory remarks to his *Meteorology*: 'I have already dealt with the first causes of nature and with all natural motion [in his *Physics*] and with the heavenly bodies arranged in their upper paths [in his *On the Heavens*], and with the number and nature of the material elements, with their mutual transformations, and with generation and destruction in general [in his *On Generation and Corruption*]. The remaining part of this enquiry concerns what earlier thinkers called "meteorology" [he means the phenomena of the lower heavens] ... then we shall see if we can give some account ... of animals and plants ...'

As this shows, Aristotle was systematic in his intention to achieve an encyclopaedic science. It ranged from the most fundamental questions about the nature of reality itself (in his *Metaphysics*) through his scientific enquiries as just noted, to his psychological studies of human beings (in his *On the Soul* and *Short Treatises on Nature*), to art and literature (included in his account of 'productive sciences' in his *Poetics* and *Rhetoric*), to matters of ethics and politics (in the *Nicomachean Ethics*, *Eudemian Ethics* and *Politics*). And alongside this great scheme lay his seminal studies of logic and reasoning; he created the science of logic almost from scratch, in the six books known as the *Categories*, *On Interpretation*, *Prior Analytics*, *Posterior Analytics*, *Topics* and *Sophistical Refutations*.

By any standard this is a hugely impressive corpus of work. What comes as a yet greater surprise in a first encounter with Aristotle is that all these works are texts of his lectures and his research notes – more accurately, those which have survived; and that the works he polished for publication have all been lost. The polished works were written in dialogue form, on Plato's model, and in contrast to the rough-hewn nature of the works we have, they were said to be of outstanding literary quality. Plato's Greek is a thing of beauty; yet so great a stylist in his own language as Cicero could say that whereas Plato's style was silver, Aristotle's was 'a river of gold'.

Most of Aristotle's lost dialogues were probably productions of his earlier years, when he was still a student and colleague of Plato in the Academy, and still under the influence of his teacher. This is surmised from such evidence as the fact that in fragments of his lost dialogue *Gryllos* on rhetoric he appears to put forward the same

view as Plato had offered in his *Gorgias*, to the effect that rhetoric is not an art (a *techne*). The difficulty with lost works known only from fragments and *testimonia* is that they can seem to commit their author to a view which he might in fact be mentioning only so that he can criticize it. This reminds one to point out that Aristotle was a philosopher who kept thinking, developing and revising his views; the writings which are collected as the *Rhetoric* that we have today followed now lost works on the same subject known as the *Technon Sunagoge*, thought to be Aristotle's earlier thoughts on the matter. It is these rather than the *Rhetoric* that underlie Cicero's writings on rhetoric.

It is a lucky accident that we have as much of Aristotle's writings as we do, given the vulnerability to disappearance of the works of antiquity. Plato's dialogues survived because his school lasted for nearly a thousand years; Aristotle's nearly did not survive at all. They did so because – so we are told by Strabo – they were left to his successor in his own school, Theophrastus, who in turn left them to his disciple Neleus. Neleus took them to his home at Scepsis in the Troad, and bequeathed them to his descendants, none of whom was in the slightest interested in Aristotle or philosophy. They stored the manuscripts in a cellar, where they were attacked by damp, mould, insects and mice. Fortunately they were bought by a wealthy Athenian bibliophile and collector called Apellicon who lived in the first century BCE. His great library was taken as booty by the Roman general Sulla the Dictator when, in 86 BCE, during the First Mithridatic War in which Rome conquered Greece, he captured Athens. The texts were taken to Rome, where Andronicus of Rhodes, one of the few survivors of Aristotle's school (which had all but died out in the third century BCE), set about editing the works. We owe to Andronicus the form and arrangement of what we have of Aristotle.

Aristotle was born in 384 BCE – fifteen years after the death of Socrates – in Stagira in Macedonia. He died at Chalcis sixty-two years later. His lifetime spanned an epoch: it stretched from the last days of an independent and truly classical Athens, where he went as a teenager to study in Plato's Academy, to the subsumption of all Greece in the Macedonian monarchy and the Empire of Alexander the Great.

Aristotle's father was the court physician to the King of Macedonia, Amyntas III, which meant that the family belonged by birthright to the medical guild of the Asclepiads, named for Asclepius the god of medicine. Aristotle's father died while he was still a minor, so he was left to the care of a guardian, Proxenus, who sent him at the age of eighteen to study in Athens with Plato. He remained a member of the Academy, first as a pupil then as a colleague, for twenty years, until Plato's death in 347 BCE. He and a fellow-student, Xenocrates, left Athens because, it is thought, they did not like the appointment of Plato's nephew Speusippus as next head of the Academy. Aristotle might have been a candidate for the headship and was not elected; or it could be that he disagreed with Speusippus' philosophical approach, which was markedly Pythagorean. Whatever the reason, he and Xenocrates went to teach at a branch of the Academy in the little Aeolian city of Assos.

The ruler of this city, Hermias, was a remarkable man who had started life as a slave and rose by his own great talents. He was an enlightened individual who encouraged the Academicians in his city. Aristotle had three contented years there, during which he married Hermias' niece Pythias, and then he moved to the nearby island of Lesbos. This was almost certainly because he wished to pursue his empirical interests in marine biology.

In 343 BCE Aristotle went to Pella, the seat of King Philip of Macedon, where he was appointed tutor – in all likelihood, *one* of the tutors – to the heir to the throne, then a

boy of thirteen. This was the youth known to history as Alexander the Great. Much speculation surrounds the fact that the great philosopher and the great conqueror bore this relation to one another, though the briefest reflection shows that Aristotle could not have had very much influence on the prince. Aristotle liked the idea of small republican polities; Alexander created a vast empire, all the way to the banks of the Jumna in India. Aristotle's ethics taught moderation in all things; Alexander drank himself to death at an early age. If indeed there was any influence it seems therefore to have been an entirely negative one. But legend was too tempted by the juxtaposition of these mighty names not to wrap itself around them: Plutarch exemplifies the point, uncritically quoting supposed letters between the philosopher and the king, letters which are almost certainly forgeries.

Philip was murdered in 336 BCE and Alexander succeeded him. Aristotle left Macedonia and went back to Athens, there founding his own school. It was located in the Lyceum, a gymnasium in the northern suburbs of Athens. His school came to be called the Peripatetic school because he lectured in the building's portico (the *peripatos*). The word 'peripatetic' means 'walking up and down'; it is unlikely that Aristotle read from those elaborate lectures of his on the move, with disciples scurrying behind him; the name of the school is architectural, not descriptive of classroom activity.

The school lasted for twelve years under Aristotle's direct leadership. But then his former pupil Alexander, by now ruler of a great slice of the known world, suddenly took an unwelcome interest in him. Alexander thought that Aristotle was part of a conspiracy to have him assassinated, and therefore instructed his viceroy at Athens, Antipater, to arrest him. The reason lay with a cousin of Aristotle's called Callisthenes, who was the historian at Alexander's court appointed to keep a record of the conqueror's campaigns. Alexander had begun to adopt the style of the oriental rulers he conquered, aping their pomp and circumstance, among other things requiring his subjects to prostrate themselves on the floor before him. This caused resentment among his Greek followers. Callisthenes criticized Alexander for this, thereby angering him (though shortly afterwards he gave up the 'oriental despot' pose for good). Callisthenes was accused of trying to incite Alexander's pages to assassinate him, and was hanged. Alexander thought that Aristotle lay behind the attempt.

The charge brought against Aristotle was the convenient one of 'impiety', just as with Socrates. The alleged impiety related to a poem he had written in praise of Hermias twenty years before. It was claimed that Aristotle's intention in the poem was to deify a mortal. Discretion being the better part of valour, and Aristotle being a man of common sense, he left Athens, saying – in allusion to its treatment of Socrates – that he was saving it from committing a second crime against philosophy. He went to Chalcis on Euboea with his pupils, and there died a year later.

In his *Physics* Aristotle describes the division of philosophy (or 'the sciences': they were the same thing) as he saw it. This was the general framework of the studies mentioned above in connection with Aristotle's systematic approach. The overarching division is between theoretical or 'speculative' philosophy and practical philosophy.

Theoretical philosophy has three components; the most general is 'first philosophy', afterwards known as 'metaphysics'; then mathematics; then physics. Physics deals with *phusis*, nature, and all it contains, from the heavenly bodies to plants and animals. The phenomena studied in physics are material, and have motion. This is the most specific of the theoretical sciences. Mathematics deals with measurement and quantity. It is less specific, more general, than physics. Metaphysics is the most general of all. It deals

What Aristotle wished to achieve was *understanding* – that is, he wished to give explanations of things and ultimately of the universe itself. The Greek word for explanation, *aitia*, also means 'cause', and Aristotle framed the task of explaining things as ascertaining their causes: to know or understand something, he said, is to know its cause. Now, causes themselves have causes, and there is a risk that the chain of explanation by causes might run back for ever. This is where definition enters the picture. Suppose you explain A by saying it was caused by B, and that B was caused by C; you will reach a point, say D (or perhaps eventually Z), where the explanation stops because at that point we say 'because it is what it is'; we have reached the definition of the thing, an account of its nature, from which explanations of C and B and A follow.

Aristotle identified four 'causes': *material*, *efficient*, *formal* and *final*. Suppose you wish to explain what a table is. You cite the material cause (the wood from which it is made), the efficient cause (the carpenter's work that brought it into being), the formal cause (the form of the thing; the pattern or design that the carpenter followed in making the table) and the final cause (the end, aim or purpose for which the table was made). When you have given all four causes you have given an explanation. Of these the most important is the final cause, the purpose or aim – the *telos*. Explanations given in terms of final causes are called *teleological explanations*.

Aristotle's epistemology and metaphysics are sharply different from Plato's. Plato's theory requires transcendent Forms as the only appropriate objects of knowledge properly so called, and therefore they must exist in a realm accessible only to the mind. Aristotle described Plato's theory as merely a poetic metaphor. Its worst fault, in his view, is its inability to explain change and how new substances come into being. How can transcendent, eternal, unchanging Forms cause anything in the realm of Becoming, where everything is in constant motion, change and flux? Aristotle's view is that instead of thinking of individual things as copies of, or somehow 'participants in', a Form, we should see them as composites of both matter and form, the form being immanent in the matter. When we say 'snow is white' we are not attributing the presence of a really existing abstract universal, 'whiteness', to the snow, we are experiencing a concrete thing ('con' signifies 'with' or 'together'; 'con-crete' denotes the accretion or joining together of two or more things) constituting white snow.

Aristotle's account of change turns on the idea of potentiality (in Greek *dunamis*, from which we get the word 'dynamic'). Substances have a potentiality either to be changed by something acting on them, which is 'passive potential', or to cause change in other substances, which is what animate things can do because they possess 'active potential'. Change requires the realization of potentiality – the making of the potential actual – which he calls *energeia*.

This leads to Aristotle's thesis about the 'first cause' of all things. Given that everything is a concretion of matter and form which have been united by a cause, and given that the causal chain cannot regress to earlier and earlier causes for ever, there must be a first cause, which to break the regress must be self-caused. This self-causing 'first mover' of the universe must, said Aristotle, be a mind, the nature of which is pure thought. It thinks about the highest thing there is, which is thought; hence it is pure thought thinking about itself. To this he gives the name God.

His reason for thinking that the first cause must be a mind or soul is that the explanation for how animate beings can move themselves is that they have souls. (Yes: the account is circular.) All animate things have 'nutritive souls' which motivate them in their most basic functions of eating and reproducing. All animals and some plants also have a 'sensitive' aspect to their souls, which enables them to perceive the environment and respond to it. Human beings have both these and a third aspect to

the soul: rationality, which enables them to think. For a living thing the soul is the efficient, formal and final cause of its being; only the material cause relates to its body.

Aristotle took the view that sensation is a passive quality of souls, allowing them to be changed by their bodies' contact with things in their external environment. We use the word 'informed' now as an echo of this theory: when one of our sense organs is acted upon by an external object the soul becomes 'potentially' what the external object is 'actually', by taking on the form (not of course the matter) of the object. Suppose I pick up a ball; the feeling of a round object consists in having the form of that object carried to my soul from my hands: I am thus in*form*ed of (more accurately, *by*) the shape of the ball.

Thought is the soul focusing upon forms without necessarily, or even often, being prompted to do so by the action of an external thing. Of course there could not be such thought without preceding contact with things, Aristotle says, thereby giving rise to the principle 'nothing in mind that was not first in the senses', a principle of empiricism. But both thought and imagination consist in the soul presenting to itself forms and the relationships between forms independently of an actual stimulus to do so from outside.

Activity and motion are the result of desire, Aristotle said; all animate things, to a greater or lesser degree, are aware of their internal states and what in the external world might address those states – satisfy or remedy them – whether they are of hunger, pain, a wish for pleasure, and more.

The foregoing account summarizes the salient points in Aristotle's metaphysics and psychology. In regard to metaphysics Aristotle attached great significance to the question of 'being *qua* being', of '*What Is* purely in its character of *Being* and the properties which it has as such'. Metaphysics is accordingly the attempt to grasp the fundamental nature of existence. In this enquiry the category of primary importance is substance (*ousia*). As we see in the logic of the categories, substance-predicates are those invoked in answer to questions of the form 'What is x?' The answer to the question 'What is Socrates?' is appropriately 'He is a man,' where 'man' is the substance-predicate. But this is not yet to get to the bottom of things. For Aristotle the more fundamental point, both literally and logically, is that substances are 'ultimate subjects', and they are 'separable'. By 'ultimate subject' he means that they exist in their own right; by 'separable' he means that they can be separated from the accidents that characterize them. For example, a man is an individual substance. Suppose he has a limp; his limp cannot be separated from him and exist on its own, so 'limpingness' is not a separable substance, but the man is; he can be conceived of apart from his limp.

This account of a difficult doctrine in Aristotle doubtless amplifies rather than clarifies the problems in it. If anything helps to clarify it somewhat, it is the etymology of the word 'substance' itself: 'sub-stance' or, as one might say, 'standing under (or underneath)' somewhat captures the idea of what exists or has being in its own right, as a fundamental category of thing, upon which other things supervene or are dependent; colours cannot exist without being colours *of* something, nor can there be limps unless there is something doing the limping; they are dependent things.

Aristotle's views in practical philosophy, ethics and politics, are much plainer sailing than his metaphysics and psychology. They turn on the idea that the best kind of society is one whose individual members live the best kind of lives. Later philosophy has found the ethical aspect of his views more enduringly important than the political aspect, because they are philosophically far richer. But to see how the different aspects of Aristotle's practical philosophy hang together, we can note the following.