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THE PRE-SOCRATIC PHILOSOPHERS

The Pre-Socratic Philosophers

A Companion to Diels, *Fragmente der Vorsokratiker*

by

Kathleen Freeman

D Litt, Lecturer in Greek at the
University College of South Wales and Monmouthshire
Author of *The Work and Life of Solon, etc*

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To
LILIANE M. C. CLOPET

ἦν γὰρ παρῇ φιλανθρωπία,
πάρεστι καὶ φιλοτεχνία

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The chapters are numbered as in the Fifth Edition of Diels,
Fragmente der Vorsokratiker The numbers in parentheses
are those of the Fourth Edition

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PREFACE

THE work done by the pre-Socratic philosophers can be only imperfectly appreciated from histories and summaries unless these are accompanied, almost from the outset, by a study of the sources of our information. For this, every student goes to the admirable collection of Diels. Here, arranged in chronological order, are the names of every man who is known, or thought, to have contributed anything to the progress of knowledge, from Orpheus to the Sophists, and under each name are given, first, statements in ancient writers about the life and opinions of the thinker in question, and second, the remaining fragments, if any, of his own works. A study of this material will dispel many misunderstandings, and all doubts as to whether the subject is worth the time and labour it demands.

But of those students who are willing to take the trouble to study the sources, many have not the time to read all the material collected in Diels. Even those who have the time would usually be glad of some guidance at first; for of the fragments of a man's work which happen to survive, not all are of equal importance, while the tradition about his life and work varies still more greatly in value and is often conflicting. The object of this Companion is to offer such guidance. It is the fruit of a number of years' experience of reading Early Greek Philosophy with university students, and its plan has developed out of an acquaintance with their needs.

The chapters follow the arrangement adopted by Diels: first what is known of the life, then of the teaching, of each thinker is summarized. Every statement is supported by an exact reference, either to the thinker's own words or to some exponent of his views; anything conjectural or controversial is designated as such. In a word, the author wishes to lead the student constantly to the sources, by offering him no statement which he cannot verify, and no opinion the basis of which he cannot examine with ease. A List of Authorities will help him to assess the value of conflicting testimony.

It was originally intended, for the convenience of the reader, to place in the right-hand margin all references to Diels and

other sources; but this in present circumstances was not possible. References to sources have therefore been placed together at the foot of the page, above the footnotes proper. The footnotes are of two kinds: quotations or comments directly concerning a reference; and quotations or comments on some point in the text itself. To distinguish these, the following system has been adopted:

Letters. ^{a b c} Reference to source.

Letters followed by number ^{1. a¹ b¹ c¹} Comment on such reference.

Numbers. ^{1 2 3} Comment or quotation not directly concerned with reference.

All Greek quotations have been kept out of the text, because the author wishes the book to be useful also to those without a knowledge of Greek; where quotations were necessary, or variant readings had to be discussed, these have been given in footnotes. Controversial points also have been kept to footnotes as far as possible, in order not to disturb the exposition of the main theme. For the benefit of non-classical students, pronunciation has been indicated in the List of Authorities and the Index by the use of a circumflex over long vowels, in the text, this use has been confined to the first appearance of less usual proper names, and to words transliterated from Greek.

References, unless it is otherwise stated, are to Diels, *Fragmente der Vorsokratiker*, Fifth Edition, edited by Walther Kranz (Berlin, 1934-8). References are to number of chapter, division of chapter, number of quotation: e.g. 22B10 = Heraclitus, Fragments, No. 10. When the reference is to the subject of the chapter, the first (chapter) number is omitted. e.g. the above reference if occurring in the chapter on Heraclitus appears simply as B10.

The author thanks Dr Geoffrey Percival, who read the proofs and made many valuable suggestions, and Miss M. Elaine Davies, M.A., who gave help in the preparation of the Index.

KATHLEEN FREEMAN

INTRODUCTION

THE problem of Knowledge, as it presented itself to the originators of the scientific study of the universe, is clearly stated by Aristotle in the First Book of the *Metaphysics*:

That from which all particular things derive their existence, that from which they originally come into existence and into which they finally lose their existence — the substance remaining unchanged underneath, though subjected to changes of form — this they posit as 'element' and 'origin' of particular things, and therefore they believe that nothing is either created or destroyed, since 'essential nature', in this sense of the term, continues ever to be preserved

This assumption that behind the changing phenomena presented by the universe to our senses there lies a reality which is unchanging, and that the pursuit of true knowledge consists in seeking out this reality, is the basic axiom of metaphysics. From Thales onward, all inquiry into the nature of phenomena tended towards one end. the answer to the question, What is the nature of the Whole? that is, What is the nature of the reality behind phenomena? For Aristotle, and therefore for us also, science and metaphysics begin together with Thales, the first man known to have attempted an answer to this question, and therefore the first man known to have posed it.

The nature of the answer depends on the way in which the question is understood. To the pioneer, What is the Whole? meant primarily, What is the material universe? — our earth with its phenomena, the heavens and their phenomena. These things are not understandable in themselves, because they change; therefore all explanation of them must go back to an unchanging underlying substance, which is material, like the Cosmos which is created from it.

Metaphysics always seeks a One — one reality behind phenomena, to discover which is to have knowledge. The Ionian thinkers assumed that their material substrate must be One. For Thales, this was Water, for Anaximander, an indeterminate substance called the Boundless; for Anaximenes,

Vapour, for Heraclitus, Fire. Pythagoras believed Number to be the unifying element, though he postulated a duality in the material universe, while Heraclitus, in opposition to him, saw in Logos or Law the One that is the governing principle, to know which is the only wisdom. Parmenides and his followers in pointing out the difficulties of believing that the One has the attributes of matter, were driven by their own logic into denying the reality of the universe of sense-perception. There followed the pluralist systems of Empedocles and Anaxagoras, evolved in an effort to 'save phenomena'. The attempt to explain the material universe in terms of a material substrate reached its culmination in the Atomic Theory of Leucippus and Democritus. But no pluralist system could ever be satisfactory to metaphysics.

The study of sense-perception and the mechanism of the organs of sense had always tended towards a disbelief in their trustworthiness, this led to the agnosticism of the Sophists, and for a time the very faith in the possibility of knowledge was threatened. But the One demanded by metaphysics was reasserted by Socrates, who in the realm of ethics made the General Definition the object of knowledge. This was applied by Plato to the whole realm of existence in his Theory of Forms, which is the final attempt to solve the problem as stated by Hellenic genius; in his metaphysical system is gathered up and harmonized the whole of the work of his predecessors. This solution was partly clarified and restated, partly criticized and emended, by Aristotle, who on the strength of a clear-cut metaphysic was able to set almost all the arts and sciences on a sure logical basis. After Aristotle, interest in science and metaphysics, except as contributing to ethics and psychology, declined, and all work after him by the Greeks and by the Romans is derivative, a restatement or reapplication of previously-formulated views. Thus ends the long train of inquiry that begins for us with Thales.

The earlier editions of *The Fragments of the Pre-Socratics* began with Thales as the first of the philosophers, but in the present edition, the philosophers are preceded by a section devoted to teachers and thinkers whose views, though not contributing directly to science and metaphysics, nevertheless had an influence on philosophic thought. This section in the earlier editions formed, together with the work of the Sophists, a

supplement at the end. It has been removed to the beginning in accordance with a wish expressed by Diels himself in his Foreword to the Fourth Edition (1922). The book is therefore now divided as follows:

- A. Beginnings
 - I. Cosmological poetry of early times
 - II Astronomical poetry of the Sixth Century
 - III Early cosmological and gnomic Prose
- B. The Fragments of the philosophers of the Sixth and Fifth Centuries (and immediate successors)
- C. The older Sophists

The editor of the Fifth Edition, explaining this change of order, points out that Diels had in mind an arrangement according to connection of thought rather than according to chronology. Under the heading 'Cosmological poetry of early times' there are to be found, for instance, not only Orpheus and Musaeus, but also later teachers in whose views Diels traced something of the old Orphic spirit. So too with the title of the whole book 'Pre-Socratics' should be understood not in the strictly chronological sense, since it is made to include contemporaries of Socrates, and even some who survived him; but as meaning all those whose thought is pre- or non-Socratic.

The book therefore now has the unity desired by Diels: it begins with what may be called, in the sense defined above, pre-philosophic thought, and it ends with the teaching of the older, non-Socratic Sophists. In between come the metaphysical scientists of the fifth and fourth centuries, from Thales to Democritus and his immediate followers.

A. BEGINNINGS

I COSMOLOGICAL POETRY OF EARLY TIMES

II. ASTRONOMICAL POETRY OF THE SIXTH CENTURY

III. EARLY COSMOLOGICAL AND GNOMIC PROSE

A. BEGINNINGS

I COSMOLOGICAL POETRY OF EARLY TIMES

I. ORPHEUS

ORPHEUS¹ lived probably in THRACE, in pre-Homeric times.

It was believed by Aristotle^a that Orpheus never existed, but to all other ancient writers he was a real person, though living in remote antiquity. Most of them believed that he lived several generations before Homer. the period 'eleven generations before the Trojan War' was sometimes specified, but it was added that Orpheus himself had lived for nine or eleven generations.^b Herodotus put forward the opinion, in opposition to others, that Orpheus was later than Homer or Hesiod,^c this was perhaps based on the belief that the Orphic poems were post-Homeric. He placed Orpheus as his own predecessor by not more than four hundred years. The usual modern view is that Orpheus was pre-Homeric, but that even the earliest poems are later than both Homer and Hesiod, possibly as late as the sixth century B.C. The earliest reference to Orpheus in extant literature is the fragment 'famous Orpheus' from the poet Ibycus, of the sixth century.^d It is just possible that a fragment of Alcaeus (seventh century) refers to Orpheus, but it is so much mutilated that the restoration of the name Orpheus is highly uncertain.^{e, e1}

Orpheus is said to have been born at Leibethra in Pieria, the district round Mt. Olympus,^f this district in classical times was part of Macedonia, but was originally Thracian. As in later times the Thracians were not regarded as true Hellenes, when c-

^a Cic. *De Nat. Deor.* I, 107 (O.F. test. 13)

^b A1, A5 ^c A5 ^d A2a ^e A2 ^f A1

^{e1} Alcaeus, frg. 80, Diehl, *Anth. Lyr.* I, 4, p. 129 (papyrus frg.). Even Diehl, who formerly proposed the restoration, now seems to wish to abandon it.

¹ For a complete collection of Orphic fragments and references, see O. Kern, *Orphicorum Fragmenta*. Diels confines himself to the earliest references and earliest attested fragments, or those in which he discerns the 'old Orphic' stratum. When a passage referred to in this chapter is not given by Diels, the reference in Kern (*O.F. Orphicorum Fragmenta*) is supplied. For a full discussion, see W. K. C. Guthrie, *Orpheus and Greek Religion* (1935), Jane Harrison, *Prolegomena to Greek Religion*, chs. IX-XII (1908).

as Orpheus was so regarded, it is thought that he may have migrated to Thrace from the south (Boeotia) or the north. This idea is supported by a pictorial representation of Orpheus in the underworld by Polygnôtus, described by Pausanias, in which Orpheus' dress is Hellenic, not Thracian, and by representations in vase-paintings, in which Orpheus is depicted as a Hellene, and his listeners as Thracians^a

His parentage is given as divine: his mother was the Muse Calliope, his father sometimes Apollo, but usually Oeagrus,^b a Thracian wine-god, who was himself descended from Atlas.^c Orpheus was said to have been a pupil of Linus, whose violent death was lamented in the harvest-songs called after him.^d

Of his life, nothing is told except legends. The suggestion that he visited Egypt in search of knowledge^e can probably be discounted. He was said to have sailed with the Argonauts on their quest, acting as coxswain, as well as musical magician and religious guide; the first mention of this story in extant literature is by Pindar^{f, g}. Euripides brought Orpheus into his play *Hypsipyle*, which dealt with the Lemnian episode of the Argonautic voyage.^h Orpheus there acts as coxswain, and later as guardian in Thrace of Jason's children by Hypsipyle. He is depicted as religious singer in the *Argonautica*,ⁱ an epic poem by Apollonius Rhodius written about 240 B.C.; and in an anonymous poem called *Orpheus*, written in the fourth century A.D., as well as in other Orphic writings.^j Earlier than the literary references is a sculptured representation of Orpheus with the ship *Argo*, found at Delphi,^k said to be of the sixth century B.C.

The other legend told of Orpheus' life was his descent to the underworld. The earliest known reference to this is the painting by Polygnôtus (fifth century B.C.) described by Pausanias (second century A.D.),^l where no mention is made of Eurydice. Euripides^m and Platoⁿ both refer to the story of his descent to recover his wife, but do not mention her name,

^a Guthrie, p. 45, Plate 6, Harrison, *Prolegomena* p. 458

^b Schol. ad Pind. *Pyth.* IV, 177, Pind. frg. 139 (O.F. test. 22, 23)

^c Ar. ^d Hom. *Il.* XVIII, 570

^e Diod. I, 23, I, 96, IV, 25 (O.F. test. 95-97)

^f *Pyth.* IV, 177 (O.F. test. 78) ^g Aga, Agb ^h O.F. 29 ⁱ Ar.

^j Guthrie, Plate 2 ^k A4 ^l A6 ^m Ar. 14

ⁿ *An Argonautica* by 'Orpheus of Croton', said to be a contemporary and associate of Peisistratus, is mentioned by Suidas s.v. Orpheus (Diels, 1 Ar.) This is probably a confusion with Onomacritus

a contemporary relief (about 400 B.C.) shows Orpheus and his wife with Hermes.^a The elegiac poet Hermesianax called her Agriope,^b and the first mention of her name in literature is in the Lament for Bion (first century B.C.)^c The Romans were the first to elaborate the story (Vergil, Ovid and others);^d the models they used were probably Alexandrian, and are lost. The essence of the story was the descent, the charming of the gods of the underworld by Orpheus with his music, the release of his wife, and his breaking of the condition imposed on him not to look back at her until they had safely reached the upper regions. The superstition against looking back is probably primitive, and shows that the story was old.^e By this means, Orpheus obtained first-hand knowledge of the underworld, and was able to pass it on to his followers.

After the loss of Eurydice, Orpheus lived as a recluse, the later story was that he thereafter preferred the company of men.^f The story of his death was variously given. Some said that he committed suicide, Pausanias records this, but says it is untrue.^g Others said that he was the victim of a thunderbolt.^h But the usual story was that he was torn to pieces by the Maenads, the female worshippers of Dionysus, either because he worshipped Apollo,ⁱ or because he scorned them in some way.^{j, k} Later, when the attacks of the philosophers on anthropomorphism began, Orpheus was said to have been thus punished for speaking ill of the gods.^l He was buried at Dion in Macedonia, and his alleged tomb was seen by Pausanias. Later authorities said that his head was borne down the river Hebrus to Lesbos, where it was buried.^k

^a Guthrie, Plate 3 ^b O F test 61 ^c O F test 62

^d Verg *Georg* IV, 453, *Cul* 268-295, *Ov Met* X, 1 (O F test 62)

^e Phanocles *ap* Stob *Ecl* IV, 20, 47, *Ov Met* X, 83 (O F test 77)

^f Paus IX, 30, 4, *sqq* (O F test 116, 120)

^g Paus I c, *Diog* L 1, 5 (O F test 123, 125)

^h Aeschyl *Basilarae* (O F test 45, 113) ⁱ Conon, *fab* 45 (O F test 115)

^j A14b, *cp* Xenophanes, 21B11

^k Phanocles (O F test 77) Verg *Georg* IV, 523, *Ov Met* XI, 50, Hygin *Astron* II, 7, Philostr *Heroic* V, 3 (O F test 131-135), Lucian *adv indoct* 109 (O F test 118)

^l Guthrie, pp 32-35, p 61 Harrison, pp 462 *sqq*

¹ It is unlikely that the 'looking back' was invented by the Alexandrians, though there were other versions of the story, some alleging that Orpheus was successful (Guthrie, p 31). The explanation attributed to Phaedrus in Plato's *Symposium* is meant to be a playful departure from the usual story. Orpheus was given a phantom, not the real woman, because of his cowardly attempt to get into Hades alive, instead of dying for love as Alcestis did (*Symp* 179D, Diels, 1A14)

Writings In the fifth and fourth centuries B.C., there existed a collection of hexametric¹ poems known as Orphic, which were the accepted authority of those who followed the Orphic way of life, and were by them attributed to Orpheus himself. Plato several times quotes lines from this collection,^a he refers in the *Republic* to a 'mass of books of Musaeus and Orpheus',^b and in the *Laws* to the hymns of Thamyras and Orpheus,^c while in the *Ion* he groups Orpheus with Musaeus and Homer as the source of inspiration of epic poets and elocutionists.^d Euripides in the *Hippolytus* makes Theseus speak of the 'turgid outpourings of many treatises', which have led his son to follow Orpheus and adopt the Bacchic religion.^e Alexis, the fourth century comic poet, depicting Linus offering a choice of books to Heracles, mentions 'Orpheus, Hesiod, tragedies, Choerilus, Homer, Epicharmus'.^f Aristotle did not believe that the poems were by Orpheus, he speaks of the 'so-called Orphic epic',^g and Philoponus (seventh century A.D.) commenting on this expression, says that in the *De Philosophia* (now lost) Aristotle directly stated his opinion that the poems were not by Orpheus.^h Philoponus adds his own view that the doctrines were put into epic verse by Onomacritus.ⁱ Aristotle when quoting the Orphic cosmological doctrines attributes them to 'the *theologoi*',^j 'the ancient poets',^k 'those who first theorized about the gods'.^l

Nothing is known of any ancient Orphic writings except a reference in the *Alcestis* of Euripides to certain 'Thracian tablets' which 'the voice of Orpheus had inscribed' with pharmaceutical lore.^m The Scholiast, commenting on the passage, says that there exist on Mt Haemus certain writings of Orpheus on tablets.ⁿ There is also a reference, not mentioning Orpheus by name, in the pseudo-Platonic *Axiochus*,^o where it is said that the fate of the soul in Hades is described on certain bronze tablets which two seers had brought to Delos from the land of the Hyperboreans. This is the only evidence for any ancient Orphic writings. Aelian (second century A.D.) gave the chief reason against believing in them at the time when Orpheus is said to have lived, the Thracians knew nothing about writing.^p

^a B1, B2, B5a^b B5^c B6a^d A14a^e A8^f Athen IV, 164b, c (O F test 220)^g B10a, B11^h B11ⁱ B11^j B9, Met 1000a9, 1091a34^k Met 1091b4^l B10^m A7ⁿ O F test 82^o 171a^p B11¹ Orpheus was sometimes credited with the invention of the hexameter, see below,

It came therefore to be believed that Orpheus taught, but left no writings, and that the epic poetry attributed to him was written in the sixth century B.C. by Onomacritus. Onomacritus was banished from Athens by Hipparchus for inserting something of his own into an oracle^a of Musaeus when entrusted with the editing of his poems. It may have been Aristotle who first suggested, in the lost *De Philosophia*, that Onomacritus also wrote the so-called Orphic epic poems. By the time when the Orphic writings began to be freely quoted by Christian and Neo-Platonist writers, the theory of the authorship of Onomacritus was accepted by many.^b

It is believed, however, that the Orphic literature current in the time of the Neo-Platonists (third century A.D.), and quoted by them as the authority for Orphic doctrines, was a collection of writings of different periods and varying outlook, something like that of the Bible. The earliest of these were composed in the sixth century by Onomacritus from genuine Orphic tradition, the latest which have survived, namely the *Voyage of the Argonauts*, and the Hymns to various deities, cannot have been put together in their present form until the beginning of the Christian era, and are probably to be dated some time between the second and fourth centuries A.D.

The Neo-Platonists quote the Orphic poems in their defence against Christianity, because Plato used poems which he believed to be Orphic. It is believed that in the collection of writings which they used there were several versions, each of which gave a slightly different account of the origin of the universe, of gods and men, and perhaps of the correct way of life, with the rewards and punishments attached thereto. Three principal versions are recognized by modern scholars, all three are mentioned by the Neo-Platonist Damascius (fifth-sixth centuries A.D.). These are.

1. *Rhapsodiae*, epic lays, said by Damascius to give the usual Orphic theology.^c These are mentioned also in Suidas' list, as 'sacred discourses in twenty-four lays',^d though he attributes this work to Theognetus the Thessalian (unknown) or Cercops the Pythagorean.^e This is now referred to as the Rhapsodic Theogony. It is the version usually quoted by ancient authorities, but was not the one used by Plato, and is therefore some-

^a Hdt. VII, 6 (O.F. test 182)

^b B11, A1

^c B12

^d A1

^e Diels, ch. 15, Cic. *De Nat. Deor.* I, 38, 107

times thought to have been composed after he wrote; this question cannot at present be decided.¹

2. An Orphic Theogony given by Aristotle's pupil Eudemus.^a

3. An Orphic Theogony 'according to Hieronymus and Hellanicus'.^b

Other versions were: a Theogony put into the mouth of Orpheus by Apollonius Rhodius in his *Argonautica*;^c an Orphic Theogony quoted by Alexander of Aphrodisias,^d and a Theogony in Clement of Rome,^e not specified as Orphic, but belonging to the same school of thought.

A long list of Orphic works is given in Suidas^f (tenth century A.D.), but most of these are there attributed to other authors. They are:

Triagmoi, attributed to the tragic poet Ion,^g in which there was said to be a chapter called *Sacred Vestments*, or *Cosmic Invocations*.^h The title *Triagmoi* apparently referred to 'the Orphic tripod of three elements, earth, water, fire', referred to by Ausoniusⁱ and Galen;^j the latter said that this doctrine was given by Onomacritus in his Orphic poems.

The *Sacred Discourses*, already discussed,^k usually identified with the *Rhapsodiae*.

Oracles and Rites, attributed to Onomacritus.

Aids to Salvation, ascribed to Timocles of Syracuse or Persinus of Miletus, both the work and these writers are otherwise unknown.

Mixing-bowls, ascribed to Zopyrus^l of Heracleia, and *The Robe*^m and *The Net*,ⁿ also ascribed to Zopyrus, or to Brontinus the Pythagorean.^o The Net referred to is the net of the body, so called in Orphic literature.^p To Brontinus was also ascribed a *Physica*, otherwise unknown.

Enthronement of the Mother, and *Bacchic Rites*, ascribed to Nicias of Elea, of whom nothing else is known. 'Enthronement' was part of the rite of initiation practised by the Corybantes, the worshippers of Rhea or Cybele, the person to be

^a B12 ^b B13 ^c B16 ^d O F 107, 108, 111 ^e O F 55, 56 ^f A1

^g Diels, ch 36 ^h 26, 74 ⁱ H Ph 18 (O F test 191) ^j Also by Clem Alex A1b

^k cp 7A11, B2 (Pherecydes) ^l A1a ^m Diels, ch 17, 4 ⁿ B10a (Aristot)

^o Guthrie, p 78, says that the date of the Theogony is bound to be one of compilation rather than composition, so that the importance of the question is considerably reduced.

^p The reading is doubtful, some take the latter title as a gloss.

^q Above, p 5

initiated was seated on a high chair, and the celebrants danced round him in a ring.^a The title therefore apparently means 'the enthronement-ceremonies as practised by the worshippers of the Great Mother'. Connected, perhaps identical with, this was a treatise on Corybantic Rites, quoted by the late Orphic poem *Argonautica*.

A *Descent into Hades*, ascribed to Herodicus of Perinthus,^b or to Cercops the Pythagorean,^c or to the unknown Prodicus of Samos.^d

Other treatises were an *Astronomy* or *Astrology*, otherwise unknown, *Sacrificial Rites*, doubtless giving rules for bloodless sacrifices, *Divination by means of sand*,¹ *Divination by means of eggs*,² on *Temple-building* (otherwise unknown), *On the girding on of Sacred Robes*, and *On Stones*, said to contain a chapter on the carving of precious stones entitled *The Eighty Stones*; a version of this work, of late date, survives. It treats of the properties of stones, precious and ordinary, and their uses in divination. The Orphic Hymns are also mentioned in Suidas' list, and a Theogony in 1200 verses, perhaps one of those versions which differed from the *Rhapsodiae*. There was also an Orphic Word-book, doubtless a glossary of the special terms used in the cult, some of which were strange because of their allegorical usage, others because of their antiquity, this also was said to have been in verse.

Such was the list of works finally classed as Orphic writings, though it was known in early times that many of them were the works of Pythagoreans and other writers. Herodotus said of the so-called 'Orphic and Bacchic rites' that they were actually 'Egyptian and Pythagorean',^e and Ion of Chios said that Pythagoras himself attributed some of his writings to Orpheus.^f Others, as has been said, regarded the earliest epics as the work of Onomacritus.^g The original Hymns were thought to

^a Plato, *Euthyd* 277d, Dio Chrys XII, 33

^b A1

^c Diels, ch 15

^d A1b

^e A5

^f A1b

^g A1, B11

¹ Αμοσκοτία MSS, emend 'Αμμοσκοτία. This would be divination by observing the movements of sand in a vessel, like ἀλφειομαντεία, divination by observing the movements of barley-grains (Iambli *Myr* III, 17, Phrynichus the grammarian, *Præp Soph* p 91B, Pollux, VII, 188, Hesychius s.v.) Nothing else is known of divination by means of sand. Other suggested emendations are ἀνεμοσκοτία, divination by means of lambs, ἀστροσκοτία (stars), ἀνεμοσκοτία (winds).

² Nothing is known of this except from Suidas s.v. Orpheus, Hermagoras; but the importance of the egg in Orphic cosmology indicates interest in hatching, and this type of divination was probably concerned with the latter (cp. Cic *De Divin*).

have been composed by Orpheus, and written down, with emendations, by Musaeus.^a There were also other writers named Orpheus to one, of Croton, said to be a contemporary and associate of Peisistratus, were attributed two epic poems: an *Argonautica*,¹ and *The Twelve-year Cycle* (probably astrological),^b to another, Orpheus of Camarina, an epic *Descent into Hades*.^b These namesakes are probably inventions.

Orpheus was the son of a Muse, and the servant of Apollo,^c he was also a teacher of the religion of Dionysus.^d In classical times he was regarded as the sweet singer, whose voice and music could lead all creatures as if by magic,^e who could tame the savage beasts of this world, and the dread powers of the next.^f He was also regarded as the teacher and prophet, the revealer and interpreter of the secret mysteries,^g the origin and nature of the gods, the right means of approaching them, the correct conduct for man in this world and the next, the rules by which the soul can attain to, or return to, its blissful home. His teaching was a blend of Asiatic and Hellenic: his music was magical in its effect, and like other wizards from the East, he taught incantations which could be used by his disciples.^h But in his acceptance of the religion of Dionysus, which had come to Thrace from Asia through Phrygia, he transmuted it to suit the Hellenic spirit, taming its more savage elements, and making of it an instrument for the training and guidance of the soul. It is sometimes thought that the legend of his death at the hands of the Maenads shows that he himself suffered for his attempt to oppose the more frenzied aspects of the Bacchic religion. The blend which he achieved was accepted by Greece, and Apollo and Dionysus were reconciled, as at Delphi. But the whole of his teachings, which were complicated in theory and demanded considerable effort in practice, were adopted by a minority only; these called themselves Orphics, small sects whose deity was Dionysus, but who worshipped him in a special way. They had ministers who performed ceremonies of purification for those who required it, these were still active in fourth-century Athens.

^a B15a, B6a^b A1^c A10, B15a^d A8^e A3, A9b, A12a, B6a, Plat *Protag* 315a^f A6^g A10, A11, A15, B15a^h A15, A9¹ See above, p. 2, note f¹

Theophrastus' 'Superstitious Man' goes to them once a month, with his wife and children.^a These ministers had as their authority the collection of sacred books comprising the Orphic bible.

Orphic Doctrine. Several versions of the Orphic Theogony existed; the usual was said to be that given in the *Rhapsodiae*, or epic lays.^b This began with Chronos (Time) as the first principle. There were differences on this point the version quoted by Eudemus^c made Night the first principle; and that of Hieronymus and Hellanicus began with water, from which was formed slime or mud (later to solidify into Earth) from which Chronos was born. Chronos was a monster, a serpent with heads of a bull and lion, and the face of a god between. He was also called Heracles. With him was Necessity, or Adrasteia, the law of destiny, which grasps the whole universe and binds it together.^d

From Chronos were born Aether, Chaos and Erebus or as the Rhapsodies put it, Aether, and a great yawning gulf, and darkness over all. Chronos then shapes an Egg in the Aether, this Egg splits, and Phanês emerges.^e Another version suggested that the two halves of the Egg went to form Heaven and Earth,^f others likened the shell to the outer sphere of the heavens, with the aether taking the place of the skin.^g The fertile Egg was sometimes called the Bright Robe, or the Cloud.^h

Phanes, the Bright One, or Light, is the first-born (*Prôto-gonos*) of the gods, in the usual Theogony. He is the creator of our universe and all that it contains. He has golden wings on his shoulders, and is a composite being having both sexes and a two-fold body. The version of Hieronymus and Hellanicus gives him bulls' heads attached to his sides, and on his head a serpent changing into the shapes of all kinds of animals: that is, he has within himself the power to create all manner of animals, male and female. His other names or epithets are: Zeus, Dionysus, Eros, Pan, Mêtis (Intellect), Erikepaios.ⁱ Of these, the first five can be given to him only in virtue of his being the creator of these and all gods, for in all theogonies, they are descended from him. The last epithet, Erikepaios, is a non-Greek, probably Oriental name, the meaning of which is uncertain, the usual interpretation was 'power',ⁱ

^a A16

^b B12

^c B12, B9

^d B13

^e B12

^f B12

though 'giver of life' is suggested by the Byzantine John Malalas.^{a, 11}

Phanes bore a daughter, Night, his opposite and partner. These two again united, to produce Gaia and Ouranos (Earth and Heaven), who united to produce three daughters, the Fates, Clotho, Lachesis and Atropos, and six sons, the hundred-armed giants, Cottos, Gyges and Briareôs, and the Cyclopes Brontês (Thunder), Steropês (Lightning) and Argês. Ouranos, learning that he was destined to be overthrown by his sons, cast them into Tartarus, whereat Gaia, angered, produced the Titans,^b Cronos, Rhea, Oceanos, Têthys and the rest. Cronos obtained the supremacy, mutilated his father Ouranos, married his sister Rhea, and, when children were born to them, swallowed them to prevent their succeeding him in power. Zeus was saved from this fate by Rhea, who sent him to Crete, and gave Ouranos a stone to swallow instead of the new-born baby. Zeus was looked after by the Kourêtes, and on coming to manhood he swallowed Phanes, thus assimilating his power, and becoming 'beginning, middle and end of all'.^c

Zeus then arranges the rest of the universe, but not without opposition. He first marries Rhea, who has now become Demeter, a daughter, Korê-Persephonê,^d is born to them. This daughter was violated by her father Zeus, and bore Dionysus, the baby was enticed away from his guardians the Kourêtes by the Titans, who lured him with toys and then tore him to pieces and ate his flesh.^e For this crime Zeus destroyed the Titans, hurling at them the thunderbolt and lightning, which had been given to him by the Cyclopes^f whom he had released from Tartarus. He restored the child Dionysus to life, and this new Dionysus became the Orphic god. He is thrice-born, having existed already in the person of Phanes, as the child of Korê (sometimes called Dionysus Zagreus), and as the god restored to life. From the ashes of the Titans Zeus made Man, who has thus a two-fold nature: the sinful, in-

^a Joann Mal *Chronogr* IV, 89, p 74 Dind (O F 65)

^b B13

^c B6, Terpander, frg 1 cp A12a (O F 21, 21a, 168)

^d B15a

^e O F 34

^f B16

¹¹ Guthrie, pp 97-100. The epithet Erikepaïos is not mentioned in older literature; the only evidence for its existence before the Christian era was discovered recently in a papyrus, where it is given as Irekepaigos (B23). An altar inscribed 'to Dionysus Erikepaïos' was discovered in Lydia in 1909.

herited from the Titans, and the divine, derived from Dionysus whose flesh they had eaten.^a

Thus the six generations^b of gods are complete: Chronos, with Aether and its counterpart Chaos; Phanes (Light) with his counterpart Night; Ouranos and his wife Gaia; Cronos and Rhea, Zeus and Persephone; Dionysus^c

A comparison of the Orphic story with other versions of Greek mythology — for instance, with the other story of the birth of Dionysus from Semele, shows that Orphism adapted or emended existing legends, or selected the version which best suited its ideas, this can be seen by comparing the Orphic theogony with that of Hesiod. Characteristic features of the Orphic story, such as Chronos, the fertile Egg, Phanes, Dionysus and the Titans, which are absent from Hesiod's version, are essential to the point of view about the origin of things, the nature of god and man, and the necessity of living the Orphic life.^d

The Orphics also used the story of the abduction of Persephone by Hades, and the subsequent search for her by Demeter; of this too they had their own version, which differed in some particulars from that given by Homer in the Hymn to Demeter, and from that current at Eleusis.^e A papyrus of the second century B.C. has been found which gives a paraphrase of a version attributed to Orpheus;^f it corresponds with the Orphic version given by Clement of Alexandria,^g and with the version used by Euripides in the Chorus of the *Helena*.^h In the Homeric version, Persephone was in Sicily when she was abducted, the Orphic version places her in Eleusis. In the former, it was the sun-god who told Demeter what had happened to her daughter, she set off in search of Korê, and reached Eleusis, where she was entertained by the king and queen, Celeus and Metaneira. In the latter, she was already at Eleusis, staying in the house of a poor man Dysaules and his wife Baubo, their sons Triptolemus and Euboules brought her the news. The story

^a O F 220-221

^b B1

^c B15a, O F. 49

^d *Protrep* II 17, 1, 20, 1 sqq (O F 50, 52)

^e 1301 sqq

^f Different authorities give these differently. Diels gives Chronos, the Egg, Phanes, Ouranos and Gaia, Zeus and Persephone, Dionysus. Guthrie omits Chronos, and gives Phanes, Night, Ouranos, Cronos, Zeus, Dionysus.

^g For a comparison between the Orphic Theogony and that of Hesiod, see Guthrie, pp 83, 84. He thinks that 'Orphism was an artificial product of sixth century Athens, using primitive myths to express a religious idea' (p 129).

^h Guthrie, p 133 sqq

of Demeter's attempt to make the infant son of her hosts immortal by anointing him with ambrosia and laying him in the fire, and of the frustration of this attempt by the mother, whose terror made the goddess reveal herself, was common to both versions.^a In the Homeric poem, the princess Iambê persuaded the goddess to cheer herself by drinking the cheese-drink (*kykeôn*), in the Orphic version, it was Baubo who by an indecent exhibition of her body made Demeter laugh and drink *kykeôn*. The title of the poem dealing with the Demeter-Korê story was *The Descent*^b (into Hades)

The reasons for the Orphic variations of this story can only be surmised, but its meaning for Orphics was bound up with their beliefs about the meaning of life and death, and the underworld. Demeter was not only an ancient chthonian goddess, but also the giver of corn, as Dionysus was the giver of wine, and able to create new life in the spring, after the apparent death of things in winter. The gift of corn meant also an advance in human civilization, and Demeter was a giver of law, in this aspect too she may have appealed to the Orphics,^c who believed that Justice was enthroned beside Zeus.^d

The Orphic theogony is parodied by Aristophanes in the *Birds*^e in the beginning were Chaos and Night, black Erebus and broad Tartarus, there was no earth, air or heavens. In the infinite hollows of Erebus, the dark-winged Night bore a wind-egg, from which Eros sprang, with golden wings on his shoulders, like the whirlwind. He, uniting with dark, misty Chaos in broad Tartarus, hatched the birds. Before, there was no race of immortals, until Love mingled all things together, by this intermingling, Heaven and Ocean, Earth and gods were created. The parody cannot of course be used as evidence for Orphic beliefs, for Aristophanes chooses what is apt to his theme, and he is satirizing philosophy as well as the Theogony, but the allusions to Chaos, Night, Erebus, Tartarus, the Egg, and golden-winged Eros (Phanes) would be familiar to his audience from the Orphic poems. He does not mention Chronos, but begins with Chaos, Night, Erebus and Tartarus; and it is Night, not Chronos, who produces the Egg from which Eros (Phanes) springs, his version is therefore

^a B15a^b B15a, A1^c B15^d B14^e 693 sqq (A12)

halfway between that of the Rhapsodies and of Eudemus. It may be purely his own, designed to suit his theme.

The version given by Apollonius Rhodius in his *Argonautica*^a has distinctive features. Orpheus, says the poet, sang that in the past earth, heaven and sea were fitted together in one form, and were then separated by destructive Hate, the stars, moon and paths of the sun have their places fixed for ever in the aether, as a sign. The mountains rose up, the singing rivers with their nymphs, and all the animals came into being. Ophion and Eurynomê, daughter of Ocean, first occupied the seat of power on snowy Olympus, he was compelled by force to yield up his office to Cronos, she to Rhea, and they fell into the waves of Ocean. Cronos and Rhea ruled for a while over the Titans, while Zeus was yet a child living in the Dictaeon cave, and before the earth-born Cyclopes had forged for him the thunderbolt and lightning which are the weapons of his power. In this version, the names Ophion and Eurynome as the earliest rulers of Olympus are unusual. Ophion is a serpent-god like Chronos and in part Phanes, he appears to come from Phoenicia^b. Eurynome, his wife, was known to Homer and Hesiod as a daughter of Oceanus and Tethys^c. Ophion was one of the Titans, Eurynome also was sometimes so described.^d Apollonius therefore takes up the story of the theogony at the point where the younger Titans have temporarily seized the power from their parents Cronos and Rhea, and are about to be overthrown by Zeus.

Different versions of the story laid emphasis on different stages of the theogony. Chronos is sometimes described as a winged monster,^e sometimes treated as an abstraction ('ageless', 'great', 'of deathless counsels'),^f or omitted altogether, according to whether oriental or Hellenic ideas prevail.¹ Sometimes Night was regarded as the real generator of all things, and a deity so powerful that even Zeus feared to offend her.^g Others, including the Peripatetics, thought that the real work of creation in the Orphic scheme began with Ocean and Tethys, who were the originators of marriage, and produced the other gods,^h this suited those who derived everything from

^a B16 ^b Pherecydes in Euseb. *Præp. Ev.* I 10

^c *Il.* XVIII 398, Hes. *Theog.* 358 ^d Callim. frg. 66

^e B13, Procl. in *Rempubl.* II 138 8 (O F 66) ^f B9, B12

¹ Guthrie, p. 85

^g B13

^h B2

water.^a The usual Orphic scheme, however, seems to have given the title of First Creator to Phanes, the bi-sexual product of the Egg, the partner and counterpart of Night, the original Eros, the first Light in the original Darkness. All theogonies agreed that in the end Zeus overcame all opposition, and ruled with the strength of the thunder and lightning, attended by Justice.

From this theogony and cosmogony followed a theory regarding the nature of man, and his destiny. In the Orphic system, the soul was sharply distinguished from the body, the body, the Titanic element,^b was at best a prison, at worst a tomb,^c for the soul, other metaphors for it were a garment,^d a net,^e a fortress.^f The soul, the divine or Dionysiac element, enters the body by inhalation from the Whole, being borne along by the winds.^g The object of life for the Orphic is to tend the divine element, and keep the body as pure as possible until the time comes when the soul is finally set free. The Orphic religion offered to its adherents first a revelation of the true nature of things, including the destiny of the soul, and second, rules for the attainment of its goal.

The attachment of the soul to a body was believed to be a punishment for past sin, in another life, or perhaps for the 'original sin' of the human race, the tasting of the flesh of Dionysus by the Titans, from whom men sprung. As the body with its appetites is the source of evil, the Orphic must be an ascetic, he must not eat animal flesh,^h or partake in any form of bloodshed, including animal sacrifice.ⁱ Other taboos existed, the reason for which is not known for instance, the Orphic, like the Egyptian, was forbidden to take wool into temples or to be buried in woollen garments.^j Though the body was an evil, the Orphic was not allowed to commit suicide, to do this was to desert one's post.^k

The soul must stay with a body until it has paid the penalty imposed for the original offence. It is probable that in the Orphic system, as in the Pythagorean, the doctrine of rein-

^a B10^b Plato, *Leg* 701c^c B3^d A1^e B10a^f B3^g B11^h A8, *Eur* frg 472 (Nauck), Plato, *Leg* 782cⁱ A11^j A5^k 44B15

^c Plato implies that the idea $\sigma\omega\mu\alpha\sigma\eta\mu\alpha$ was not Orphic *Cratylus* 400b, c. Probably this idea was found in some version with which he was not acquainted. See Philolaus, Diels, 44B14, and cp below, p 231, note 2.

carnation was taught: a cycle of lives was required for purification. This doctrine is nowhere attributed to Orpheus, but the language in which it is described by Plato (in the *Phaedrus*,^a *Phaedo*,^b *Gorgias*,^c *Meno*^d and *Republic*^e), by Pindar in the Second Olympian Ode, by Empedocles in the *Katharmoi*, and by Herodotus,^f often suggests the Orphic terminology. During its life on earth, the soul, if in a human body, must observe the rules of diet and the rest, and submit to initiation, which included regular purificatory ceremonies under the supervision of a priest.^g What these were is not known; it was sometimes complained that they were merely formal, and that prescriptions for salvation could even be bought^h these would be derived from the Orphic books on ceremonial, such as the *Sacrificial Rites*. Probably, like the mystery religions, the Orphics offered some kind of communal worship, which included prayers, hymns,ⁱ sacrifice (non-animal) and a representation of the outstanding events in the Orphic mythology, such as the death of Dionysus, and the abduction of Persephone.¹

If this way of life was faithfully observed, the initiate could hope for everlasting happiness in the next world, when he would be released from the body, and would join the company of the blessed. Those who lived a life of impurity and crime would be everlastingly punished, being plunged into mud, or given some endless task such as the filling of sieves.¹ The conception of the happy state seems sometimes to have been materialistic, a contrast to the ascetic life demanded here below: Adeimantus in the *Republic* accused 'Musaeus and his son'^a of making out the good life to be nothing but feasting and everlasting drunkenness.^k The soul's final abode seems to have been described as a kind of Isles of the Blest¹ where the saints lived together in a blissful, carefree state, like gods^m

^a 243e sqq ^b 110b sqq ^c 523a sqq ^d 81a sqq ^e 614b sqq

^f II 123

^g A16

^h Plat *Rep* 364b

ⁱ B15a

¹ B4, cp Plat *Gorg* 493a, *Phaed* 69c, and Olympiod *ad loc* (O F 235), Paus X,

31 9 sqq

^k 363c (B4)

¹ A13a, Pind *Ol* II, 62 sqq

^m Emped 31B146, 147

¹ Hdt wrongly attributes the origin of the theory to Egypt, and says that there are some Greeks, whom he will not name, who have borrowed it

¹ Guthrie, p 202 sqq. The Bacchic ceremonial of initiation observed at Athens in the fourth century B C is described inimically by Demosthenes *De Cor* 129, 259-260

² See below, p 20. The reference is to the Orphic sect, as Plutarch observed (*Comp Cim Luc* 2)

— a description open to materialistic as well as allegorical interpretation.¹

The soul, on leaving the body for the last time, did not at once arrive at its destination. There was a journey to be made in the underworld also, and for this too the Orphic religion offered exact rules to its initiates. Information regarding these rules is principally derived from a number of gold plates^a,^a discovered in tombs in Italy and Crete, the oldest, those from South Italy, belong to the fourth century B.C., while the latest, from Crete, may be anything from the second century B.C. to the second century A.D. in date. They were designed to be worn or carried by the dead person, and are inscribed with hexameter verses (interspersed with a few short formulae in prose) giving exact directions regarding the route to be taken and the replies to be made to those who guard the way.

The soul is told that it will come to two springs beside the halls of Zeus, one on the left, which it must avoid (this is Lethe, the water of forgetfulness, to be drunk only by souls that have to return to the other world again),^b one on the right, which it must drink this is Memory. Beside it are guards, to whom the soul must proclaim its divine lineage, saying 'I am the child of Earth and starry Heaven (Ouranos), and my race is heavenly. I am parched with thirst. Give me cold water from the pool of Memory'. The guards will give the soul water from the divine spring, and henceforth he will reign with the other heroes.^c

Before its final apotheosis, the soul, going to the right through the holy groves and meadows, at last stands before Persephone, Queen of the Underworld, and other gods, including Hades (euphemistically called Euklês, the far-famed) and a deity called Euboulos, perhaps Zeus or Dionysus. He (or she) voices a claim to return to their blessed race, to which he originally belonged, but from which he was banished 'by Fate', when he and the other immortals were overcome by the thunderbolt and lightning-flash (that is, when the crime of the Titans was punished by Zeus). He claims now to come before

^a B17-19a

^b Plat. *Rep.* 620a

^c B17, B17a

^{a1} For a reproduction and critical examination, see Harrison, *Prolegomena*, Appendix by Gilbert Murray, for a translation, Guthrie, pp. 172-173.

¹ It is probable that the residence in Elysium was not equivalent to Heaven, but was the final resting-place in the last stage of the journey, before the Apotheosis. Guthrie, pp. 184-185.

them 'pure, from the pure', and supplicates Persephone that she may be kind and send him to the abodes of the pure: he has 'flown out from the circle' (that is, escaped from the cycle of reincarnation), 'stepped on to the crown with swift feet' (that is, probably, won the prize of victory), and 'slipped into the bosom of the Mistress, Queen of the Underworld' (that is, come down below Earth to Hades). The answer, if all is well, is an invitation to the soul to approach and be made a god instead of a mortal.^a One of the plates bids him rejoice at this experience which he has never before undergone.^b The recurring formula, 'I have fallen as a kid into milk', is interpreted to mean that the soul has reached an abundance of what it desires, but it seems rather to refer to some magic ceremony of rejuvenation or restoration, such as that practised upon Pelias by his daughters on Medea's advice; this may have been dramatically represented in the Orphic ceremony of initiation, and may have formed part of the story of the resurrection of Dionysus. The Orphic initiate, like Dionysus, has been restored after the severance of body and soul.

One of the tablets^c found in South Italy, though largely unintelligible, contains a list of names of deities, and a reference to a seven-day fast; it appears to be a charm concerned with healing.¹

The inner rites of the Orphic religion were secret except to initiates, like those of the other mystery-religions, though some of the literature was open to all. The Orphics assisted the preservation of their secrets by the use of a highly allegorical vocabulary, which would be plain to initiates, but for others would need an interpreter.^d Later, glossaries appeared: Clement of Alexandria gives a selection of strange terms from a poem on Orpheus by the Alexandrian scholar Epigenes,^e these are concerned with ploughing, sowing, and the seasons.

A papyrus of the third century B.C.,^f though much mutilated, appears to contain directions for some kind of mystery-rites, possibly Orphic. There are references to 'paying for the sins of the fathers' (that is, the Titans), to Demeter, Rhea, and the armed Kourêtes, and to the sacrifice and eating of a goat

^a B18-19a

^b B20

^c B21

^d Pind. *Ol.* II, 93-94

^e B22

^f B23 (O F 31)

¹ Gilbert Murray in Harrison, *Prolegomena*, pp. 664-666. Diels attempted a reconstruction in hexameter verse, and called it (without justification) a Hymn to Demeter.

and a bull (which is Bacchic, but not Orphic). No uninitiated is to look on Gods, including Euboulos and Phanes Irekepaigos, are called upon, the last as saviour. The toys by which Dionysus was beguiled to his doom are mentioned: top, rattle, dice-bones, mirror.

The debt of Greek philosophy to Orphism cannot be measured because of the uncertainty regarding the date of composition of the Orphic writings. It can, however, be said that there was considerable interaction. Thales derived all from water, as the early myths derived them from Ocean, Anaximander derived life from the original mud, Anaximenes thought of the soul as breath and air. Pythagoras and Empedocles taught metempsychosis, and the latter preached a life of abstinence from animal flesh and bloodshed. All envisaged the beginning of our universe as a Chaos in which all things were mixed together, Empedocles made Love and Hate the creative forces in his cosmogony. Xenophanes and Heraclitus attacked all religions, including Orphism. Xenophanes' criticism was directed primarily against their doctrines regarding the gods, Heraclitus' against their teaching on the next world. Others, like the Sophists, used the Orphic writings in their eclectic schemes^a.

Plato and Aristotle also were familiar with these writings. Plato was temperamentally more in sympathy with their outlook^b than Aristotle, and frequently quotes lines from the Orphic poems, though he tends to speak rather of 'the ancient theologians' than of Orpheus or the Orphics. The doctrine of metempsychosis suited his theory of *anamnêsis*, and it has been suggested that his contempt for the body and for the world of sense-perception was not uninfluenced by the Orphic view of life as an exile from bliss and a penance, and the body as the source of impurity.¹ Aristotle regarded the Orphic poems as much later than they purported to be; but he was interested in them, and sometimes compared their views on the origin of things with those of the scientific philosophers.

^a A13, 86B6 ^b B8

¹ Guthrie, p. 157

2. MUSAEUS

MUSAEUS,¹ said to be of ATHENS, was thought to have lived in pre-Homeric times.

Musaeus is a more shadowy figure than Orpheus. The Athenians of the fifth century B C claimed him as a fellow-citizen,^a and his Athenian origin was generally accepted in later times,^b when he was regarded as a member of the family of the Eumolpidae,^c and resident at Eleusis.^d Occasionally, however, he was said to have come to Athens from Thrace;^{e, e¹} this was merely a concrete way of expressing his close connection with Orpheus

His mother was always said to be the Moon (Selênê, Mênê),^f she being the patron of all magic. His father's name was usually given as Antiphêmus^g (Antiphemus in epic verse)^h or Eumolpus,ⁱ both of which express prowess in song. Some authorities gave a genealogical table going back for several generations. The Scholiast on Sophocles' *Oedipus Coloneus* gave Musaeus' ancestors as Eumolpus I, Keryx ('Herald'), Eumolpus II, Antiphemus, the list in Suidas was: Kerkyon, Ecphantus ('Revealer'), Euphemus, Antiphemus. The names have a fictitious sound, and all that can be said of them is that the authority who gave the former list was chiefly concerned to include Musaeus in the priestly Athenian clans of the Eumolpidae and the Kêrykes, whereas the second derived him from a more mythical and chthonian ancestor, the cruel monster Kerkyon,^j who was tyrant at Eleusis, and who put to death his daughter Alopê and all strangers whom he overthrew in wrestling, until he himself was slain by Theseus.^j Another

^a 1A10 ^b A1, A4 ^c A3a, A1, A6 ^d A9, A1a ^e A1a, Strab 471 17

^f A1, A2, A6, A7, 1B5 ^g A1, A3a ^h B11, Orph *Arg* 108 (O F 168)

ⁱ A4, Anth Pal VII, 615 ^j A1

^{e¹} Paus I, 38, 2 makes his ancestor Eumolpus come from Thrace

^k Kern, O F *testt* 166-172

² There is no need to alter the name to Κρέκων or Κρόκων, as some German commentators have done, on the ground of its unsuitability (Pauly-Wissowa s v Musaeus, Vol XVI, 1, p 759). It is more likely that the name Κερκυων, which symbolizes the resistance of Eleusis to the synoecism of Theseus, was later smoothed away into Κήρυξ. Κερκυων (κέρκος) is the 'tailed monster', the original serpent-deity of Eleusis, and the story embodies a wish to make Musaeus descend (through several oracular priests) from the autochthonous owner

tradition connected Musaeus with the royal house of Athens, through Mêtion ('prudent in counsel'), a son or grandson of Erechtheus, and Steropê ('Lightning-flash').^a

The name of Musaeus' wife is only once even suggested: some surmised that the inscription on a grave-pillar found at Eleusis, 'This is the tomb of Dêiopê', referred to Musaeus' wife, but others said that she was the mother of Triptolemus.^b Hermesianax, the elegiac poet of Colophon, who lived in the time of Alexander, mentions a certain Antiopê, priestess of Demeter, whom Musaeus had celebrated in his poems;^c he does not say that she was the wife of Musaeus, however. The names, in any case, are merely suitable inventions.

The son of Musaeus was usually said to be Eumolpus.^d He was thought to have taken over the work of his father at Eleusis: to have published his father's poems,^e to have revealed to the worshippers the rites taught by his father, and to have become the first priest of the Mysteries.^f

The period at which Musaeus lived was generally supposed to be that of Orpheus; he was usually described as the pupil,^g sometimes even as the son,^h of Orpheus, though another tradition made him the elder.ⁱ The Marmor Parium placed his son Eumolpus in the reign of Erechtheus,^j thereby equating him with the Eumolpus, son of Poseidon and Gê, who came to Eleusis from Thrace, and was slain in battle by Erechtheus;^k but other authorities preferred to regard the Thracian Eumolpus as an ancestor of Musaeus, and to make Musaeus live at a time when Eleusis and Athens had composed their strife. Some placed Musaeus in the reign of Cecrops II,^l the son of Erechtheus, the fifth king before Menestheus who was in command of the Athenian contingent at Troy. Another contemporary of Musaeus was Heracles, who visited Eleusis and took part in the Mysteries when Musaeus was in charge.^m All these attempts at dating are as confused and vague as the Attic legendary monarchy to which they attach themselves; if Musaeus existed, he introduced to Athens and Eleusis the mystery-religion called Orphic, and this took place in prehistoric times, during the period when Eleusis, though attached to Athens, had not yet relinquished all attempts at independence, he played his part in defining

^a A10 ^b A1 ^c A2 ^d A1, A3a ^e A8, cp. B4 ^f A3a ^g A1, A7
^h A9, A7 ⁱ A1 ^j A8 ^k Strab. VIII. 383 ^l A1 ^m A9

the functions of that religious community, and so helped to clarify its relations with the governing state. No more than this can be said, and even this is highly conjectural.

The Athenians cherished the memory of Musaeus. His portrait was to be seen in Pausanias' day in the Art Gallery of the Propylaeum on the Acropolis;^a and his grave was pointed out on the Hill of the Muses near by,^b though some said he was buried nearer the sea, at Phaleron.^c The earliest extant reference to him as an Athenian is that of Euripides in the *Rhesus*,^d Sophocles in a play now lost spoke of him as an interpreter of oracles.^e Later, books were written about him and about the poems which went under his name, in the fourth century B C, by Herodorus of Heracleia^f (who wrote a monograph on Orpheus and Musaeus) by Glaucus of Rhegium,^g by Aristoxenus (the musician and pupil of Aristotle, writer of *Memoirs of Praxidamas*, an earlier writer on music),^h by Andron (probably of Teos, who wrote on *Family Relationships*)ⁱ and by Philochorus.^j His oracles were mentioned by Herodotus,^k and the poems attributed to him are referred to by Plato and Aristotle;^l but quotations are few, and references are mostly by late grammarians

Writings. The list of writings attributed to Musaeus is much shorter than that of Orpheus. He is sometimes credited, like Orpheus, with the discovery of letters,^m and also (by Democritus)ⁿ with the invention of the hexameter, whereas Critias attributed this to Orpheus himself.^o Tradition liked to place his poems, with those of Orpheus, long before Homer and Hesiod,^p but as with Orpheus, it was later suspected that most of the poems were written by Onomacritus in the time of the Peisistratidae.^q This view perhaps originated with the story told by Herodotus, that Onomacritus was caught by the dithyrambic poet Lasus of Hermione inserting an oracle into the poems of Musaeus, which he had been employed by the Peisistratidae to edit.^r Aristotle speaks of 'the poems said to be by Musaeus'^s when quoting a line; and later it became customary to refer to them in this way.^t Pausanias states

^a A5 ^b Paus I, 25, 7 ^c Anth Pal VII, 615 ^d 945 (1A10)
^e A6 (frg 1012) ^f 1A13a ^g A12 ^h A12 ⁱ A3a ^j A6
^k B20a, B21 ^l 1B5, 1B4, 2B3 ^m A10, cp O F test 123 ⁿ 68B16
^o 88B3 ^p A8 ^q A5 ^r B20a ^s B3 ^t B10, B14, B15

categorically (doubtless quoting an earlier authority) that none of the poems is certainly by Musaeus except the Hymn to Demeter written for the Lycomidae.^a Others, however, believed so strongly in the authenticity of the poems that they traced lines in Homer and Hesiod to the poems of Musaeus, on the assumption that likenesses meant borrowing by the former from the latter,^b in particular, this view was held by Gorgias.^c Another view was that Orpheus inspired and composed the poems, Musaeus wrote them down with a few emendations,^d and Eumolpus his son published them.^e Some of the poems were attributed to Eumolpus himself.^f

The titles of works attributed to Musaeus were a *Theogony* and a *Sphere* (the authority says he composed these first,^g poems of these names being also attributed to Orpheus), a *Titanomachia* (the Scholiast's *Titanographia* is probably an error)^h perhaps in several lays (this was however sometimes excluded from the poems attributed to Musaeus),ⁱ *Eumolpia*, an epic poem of which nothing is known,^j a Hymn to Demeter written for the Lycomidae (the only genuine work, according to Pausanias),^k a Hymn to Dionysus;^l a number of oracles,^m a book of magic cures for diseases,ⁿ and *Admonitions*, an epic poem written for his son.^o Eugamon of Cyrene, an epic poet of the sixth century B.C., incorporated into his poem *Telegonia* a book on the Thesprotians (in whose territory the oracle of Dodona was situated) which was said to have been borrowed entire from Musaeus.^p

Doctrines Musaeus was considered to be, as his name implies, a servant of the Muses, or as the poet Hermesianax calls him, 'Steward of the Graces'.^q He was the 'pupil' of Orpheus, that is, he represented the coming of Orphism to Athens, and its settlement at Eleusis beside the great mystery-cult of Demeter and Korê. Orpheus was said to have addressed his first poem, called *Crater*, to Musaeus,^r and Musaeus is often addressed directly in the Orphic poems.^s He revealed the rites — absolutions, initiations, purifications — taught by Orpheus, but he did not himself originate any of these doc-

^a A₅ ^b B₄, B₇ ^c 82 B₂₅ ^d B_{19a} ^e A₈ ^f B₁₂, 1 B₄
^g A₄ ^h B₁ ⁱ B₁₄ ^j A₁₁, B₁₁ ^k A₅, B₂₀ ^l B_{19a}
^m B_{20a}, B₂₁, B₂₂, 1 A₁₁ ⁿ 1 A₁₁ ^o A₁, cp Isocr. *Nicochl.* 3 ^p B₆
^q A₇ ^r A₇ ^s O F 245, cp *test* 168

trines. his teaching was 'in all things an imitation of Orpheus' ^a He was, like Orpheus, a sweet singer, and believed that 'the greatest joy for mortals was to sing', ^b hence he was credited with having composed special hymns. He was a giver of oracles, ^c a healer, ^d endowed with magic powers ^e

The poems belonging to the Orphic corpus which were attributed specially to Musaeus were for the most part a retelling of ancient legends in accordance with Orphic beliefs. An attempt to relate him to philosophy was made by saying that he taught that all things are derived from a One, and are disintegrated back into it, ^f but this meant no more than that the Orphics envisaged the state preceding creation as a void in which darkness and confusion prevailed. One authority (Philodemus) says that the poems attributed to Musaeus gave a pair, Tartarus and Night, as the source of all things, 'the author of the *Titanomachia*', whom he envisages as someone other than Musaeus, said that all things came from Aether ^g Little else is known about his supposed cosmological views, there are one or two references to the constellations and other meteorological phenomena, but they appear to belong rather to mythology ^h The remark that shooting stars are borne up from Ocean, quenched in Aether, seems to be a counterblast to the usual view, the idea is that they are quenched in a brighter light, as the light of the other stars fades before the sun.

Aristotle quotes a line from the Musaeic poems which seems to embody a variant theory on the World-Egg: the eagle lays three eggs, of which it hatches two. ⁱ ^j If this is intended as an analogy, it differs from the usual Orphic theory of a single World-Egg from which the double-natured Phanes is hatched, but as the context of the line is lost, it is difficult to conjecture what its exact significance may have been.

^a Paus X, 7, 2

^b Aristot *Pol* 1339b21

^c A6

^d 1A11

^e A5

^f A4

^g B14

^h B18

ⁱ B3

^j ὅς τρία μὲν τίκεται, δύο δ' ἐκλέπτει, ἐν δ' ἀλείζει. The line as it stands means '[the eagle] who (masc.) lays three eggs, hatches two, and cares for one'. From the context in which Aristotle quotes it, the required meaning seems to be 'who hatches two, and gets rid of (or neglects) one'. The line is quoted also by Plutarch, *Marius* XXXVI, with ἀλυβάζει instead of ἀλείζει. The word seems therefore to be corrupt. D'Arcy Thompson (*The Works of Aristotle Translated*, Vol IV, *Historia Animalium* 563a, Note 4) aptly draws attention to a passage in the Egyptian writer Horapollon, II, 99, where it is said that the hawk (λέπας) lays three eggs, but hatches out only one, and breaks the others. Perhaps this is the myth that lies behind the Musaeic line, which may have been misquoted or misunderstood by Aristotle.

The Musaeon poems retold a number of myths dealing with the births of gods and the founding of states. Zeus when born was handed by Rhea to Themis, who gave him to Amalthea, who possessed a goat, the daughter of Helios; the goat reared Zeus in the caves of Crete, where she had been hidden because of her fearsome appearance, which offended the gods of Cronos' day. When Zeus grew up and wished to make war on the Titans, he had no weapons; obeying an oracle, he took the goat's skin, because it was invulnerable and of terrifying appearance, having the face of a Gorgon upon it. He made another skin for the goat, whom he dowered with immortality and set in the heavens as a constellation. He himself thus won the epithet 'Aegis-bearing'.^a

Of the birth of Athene, Musaeus said that Palaemon, not Hephaestus, split open the head of Zeus.^b Triptolemus, the Eleusinian hero, was of divine origin, the son of Ocean and Earth.^c Hecate, goddess of the underworld, was the daughter of Asteria and Perses, to whom Zeus gave Asteria after he had discarded her.^d Argos, the four-eyed giant, begat four Aethiopian kings by Kelainô, daughter of Atlas.^e Melitê, from whom the Attic deme derived its name, was a daughter of Apollo.^f There were two generations of Muses, the elder in the time of Cronos, the younger sprung from Zeus and Mnemosyne.^g The Hyades, nurses of Dionysus, were so-called after their brother Hyas, whom they lamented when he was killed in hunting, they were five in number, and the seven Pleiades were their sisters, daughters of Ocean and Aethra.^h

The Musaeon poems discussed the founding of Thebes, to the site of which Cadmus was guided by a heifer. In the Hymn to Demeter for the Lycomidae, it was told how Kaukon son of Kelainos son of Phlyos took the rites of the Great Goddesses from Eleusis to Andania in Messenia during the reign of Polykaon and his wife Messene.ⁱ Phlyos son of Gê was probably the eponymous hero of Phlya,^j the Attic deme where the Lycomid family had a sanctuary or place of initiation, and presided over rites at which they sang hymns to Eros attributed to Orpheus and Pamphôs,^k as well as the Hymn to

^a B8 ^b B12 ^c B10 ^d B16 ^e B13 ^f B9 ^g B15

^h B18 ⁱ B20 ^j Paus IX, 27, 30 (O F 304, 305)

^k For the mystery-cult at Phlya, and the Lycomidae, see Harrison, *Proleg* pp 640-599; Guthrie, *Orpheus*, pp 123-124

Demeter attributed to Musaeus. The origin of the Delphic oracle was also narrated: it was originally shared by Poseidon and Gê; the latter spoke directly, the former through his minister Pyrkôn.^a

The eschatology outlined in the poems attributed to Musaeus and his son was, according to Plato, more hedonistic than that of Homer and Hesiod. The Musaeian poems offered as rewards to the just a 'symposium of the saints' in Hades, a kind of everlasting drunkenness, while they plunged the wicked into mud, or made them carry water in a sieve.^b No moral precepts survive from these poems, those who believed that Homer borrowed from Musaeus pointed to the description of the generations of men in both epics,^c but whereas Homer was thinking of the short-lived nature of man, the Orphic poems seem to have stressed the fact that though one generation dies, another always arises. Homer's vivid line, 'the woodcutter excels by craft rather than force',^d is quoted as derived from the colourless Musaeian line 'art is ever superior to strength'.^e Hesiod's lines from the lost *Melampus*, that it is sweet to learn the sure criterion of ills and blessings which the immortals have established for mortals, was said to have been taken from Musaeus entire,^f the reverse is of course the truth.

There are hints that the poems of Musaeus dealt with the magic properties of plants, for healing and other purposes. They mentioned (like Hesiod) the plant *tripolium*, a kind of star-wort, as a panacea if dug up at night,^g and also the *arkeuthos*, a thorny bush sacred to Apollo, used by Medea to charm the dragon.^h The latter reference shows that an *Argonautica* was sometimes attributed to Musaeus.

Musaeus as a giver of oracles was classed with Orpheus,ⁱ the Sibyl, Bakis the Boeotian seer, and others. Herodotus mentions Musaeus as one who had prophesied concerning the battle of Salamis, but prefers to quote the exact words of the otherwise unknown Lysistratus.^j Pausanias quotes a Musaeian oracle which, he says, people apply to the disaster of Aegospotami; but the lines quoted are vague.^k

^a B11

^f B7

^b A5a

^g B9

^c B5, *Il* VI, 146-149

^b B2

^j B21

^d *Il* XXIII 315

ⁱ *Plat Protag* 316d (O F *test* 92, and ch 35)

^k B22

^e B4

3 EPIMENIDES

EPIMENIDES of CRETE (Phaestus or Cnossus)· date uncertain, but he probably lived in the late sixth and early fifth centuries B.C.

The existence of Epimenides has been doubted, the miraculous stories told about him, and the different testimony regarding the period in which he lived, have led some to suppose him a fiction. Aristotle,^a Plutarch^a and Suidas^b follow the tradition that he visited Athens some time before Solon's archonship to assist in purifying the city from the Cylonian pollution. Plato says that he came to Athens ten years before the Persian invasion, at the command of the Delphic oracle, the purpose of the visit is not stated, but he performed certain religious ceremonies, acting under the orders of the Pythia.^c The testimony of Plato is thought to have weight because it is put into the mouth of the Cretan, Epimenides' fellow-countryman, in the *Laws*, and elsewhere in the same dialogue Epimenides is mentioned in a list of ancient and legendary figures — Daedalus, Orpheus, Palamedes, Marsyas, Olympus, Amphion — as having been born 'only yesterday' ^d Diogenes Laertius preserves a combination of both stories, to which he adds another anachronistic statement that it was Nicias son of Niceratus who was sent to bring Epimenides from Crete. The purpose of the visit was the performance of a purification after a plague, which Epimenides declared to have been caused by the Cylonian crime. To this Diogenes adds a date the forty-sixth Olympiad, that is, 596-593 B.C. His authorities are given as Plutarch, Theopompus, Sosibius and others, and he mentions as evidence of Epimenides' visit certain 'nameless altars' still to be seen throughout Attica ^e Suidas gives the date of Epimenides' birth as the thirtieth Olympiad, and the date of the purification as the forty-fourth Olympiad (604-601 B.C.).^f Eusebius gives 594 or 597 B.C. as the date of the purification.

Thus it was disputed in antiquity whether Epimenides visited Athens before Solon's legislation, in about 600 B.C., or during Solon's legislation in 594 B.C., or before the Persian Wars, in 500 B.C., or after the plague during the Peloponnesian War, in about 428 B.C. It seems probable that the visit

^a A₄^b A₂^c A₅^d A₅^e A₁^f A₂

took place in connection with the first disturbance over the Cylonian pollution, as Aristotle and Plutarch say, at a time when the superstitious fears aroused by the murder of Cylon's supporters were at their height. The purification probably took place after the trial of the Alcmaeonidae instigated by Solon, it may have been suggested by Solon, who may have met Epimenides on his travels. In later times, whenever a similar situation arose, the Cylonian pollution was resuscitated, and with it the rôle of Epimenides, that is to say, ten years before the Persian invasion, when Athens was in the same disturbed state as during the Megarian War a century earlier, and when, it seems, a plague broke out,^a and again during the early years of the Peloponnesian War, when the great plague raged and Attica was devastated by the enemy. It is possible that on the last occasion Nicias was entrusted with some purificatory mission on the lines which tradition ascribed to Epimenides, he may even have been sent to Crete to appeal to Epimenides' shrine. So too, in the years of political unrest following the expulsion of the Peisistratids, Epimenides may have been invoked in connection with the legislation of Cleisthenes, just as he was originally believed to have assisted Solon. The Cylonian pollution was revived at this time by the Spartan king Cleomenes, and it was being used as a means for keeping the Alcmaeonid family in exile. Thus the original visit, if it occurred, probably took place about 600 B.C., and the stories of later visits are a confusion with later occasions when similar purifications were made.

Epimenides was credited with a very long life, Xenophanes of Colophon gave his age at death as 154 years;^b Phlegon, who wrote a book on longevity, gave it as 157 years,^c and the Cretans as 299 years.^c The object was doubtless to make his life long enough to include all the purifications attributed to him, as well as to enhance his reputation as a wizard.

The stories of his life are nearly all miraculous. He is said to have slept for over fifty years in a cave,^d though rationalists said that he merely absented himself in order to do research on herbalism.^e He was able to do without food and drink.^f Some said that the Nymphs provided him with a special food.^g He

^aC I A 1 475

^b21B20

^cA1 §111

^dA1 §109, A8

^eA1 §112

^fA5

^gA1 §114

could leave and return to his body when he wished.^a When founding a sanctuary to the Nymphs, he heard a voice from heaven bidding him dedicate it not to the Nymphs but to Zeus.^b His body when he died was found to be tattooed with letters,^c it was preserved by the Spartans in accordance with an oracle.^d The Cretans later sacrificed to him as to a god, because of his prophetic powers.^e

Epimenides was sometimes numbered among the Seven Sages, in place of Periander,^f but his 'wisdom' belonged, as Plutarch says, to the sphere of the mystery-religions. The Cretans called him *Kourês*, thus associating him with the Dionysiac cult, and said that his mother was a nymph, he worshipped the Nymphs and was cared for by them. He was also connected with the Eumenides some thought that he had founded the shrine of the Semnae on the Athenian Areopagus,^g and others attributed to him the famous stones of Hybris and Anaidera used by defendant and prosecutor before the Areopagus Court.^h Like Orpheus, however, he also served the Olympian deities he founded an altar to Zeus, and it was the Delphic oracle which summoned him to Athens and directed his purifications there. He was therefore not an independent worker, but a famous representative of Orphism whose home was in Crete, and who drew on the ancient traditions of Cnossus and Phaestus and Mount Ida for his magic lore, as well as on the cults of Zeus, Dionysus and the Nymphs established there. The legend of his sleeping in a cave suggests prolonged absences when he frequented the Dictaeon cave pursuing religious exercises and magical lore. He was said to have claimed at Athens that he had had no human teacher, but that his teacher was a long sleep and dream, in which he had consorted with gods, Truth and Justice,ⁱ this, and the legend that he could leave and return to his body at will,^j suggest that he practised the trance-state. His concern with fasting and an ascetic diet was also Orphic, he seems to have discovered new ways of doing without food, and that certain foods were specially efficacious in staving off hunger and thirst;^k hence the story that he received a special food from the Nymphs. Certain herbs were also purificatory.^k He

^a A2^f A5^b A1 §115^g A1 §112^c A2^h A7^d A1 §115ⁱ B1^e A1 §114^j A2^k A5, A6, A1 §§112, 114

believed in metempsychosis: he called himself Aeacus, and claimed to have lived many lives.^a

According to the authorities used by Diogenes Laertius, Epimenides in his purificatory ceremonies relied chiefly on animal sacrifice and the founding of shrines; there is also a suggestion that he advocated human sacrifice.^b Plutarch, however, says that his rites were all of a civilizing and restraining tendency: that he paid particular attention to removing the barbaric element from funeral ceremonies, to which the women were specially addicted, and that these activities greatly helped Solon by preparing the way for his legislation.^c He also employed incantations.^d For these activities he was offered large rewards by the Athenians, but he refused all recompense except a branch of the sacred olive.^e

He was also credited with a number of oracles.^f To the Athenians he prophesied the coming and defeat of the Persians;^g and on seeing the headland of Munychia, he declared that the Athenians did not know what ills it would cause them, or they would destroy it with their teeth.^h To the Cretans or the Spartans he prophesied a defeat of the Spartans by the Arcadians at Orchomenus,ⁱ nothing further is known of this. Aristotle, however, says that Epimenides did not give oracles about the future, but confined himself to explaining obscurities of the past.^j

A number of epic poems were ascribed to Epimenides. Suidas says that he wrote much in epic verse, but he gives no list.^k Diogenes Laertius' list mentions a Theogony, apparently including an *Origin of the Kouretes and Korybantes*, in 5,000 lines, a poem on the building of Argo and the voyage of Jason, in 6,500 lines, a poem on Minos and Rhadamanthys in 4,000 lines, and a prose work on *Sacrifices and the Cretan Constitution*.^l It is clear therefore that there was a tendency to attribute to Epimenides certain Orphic writings, especially all those which had any connection with the cult in Crete.

The existing fragments attributed to Epimenides appear to belong mostly to a theogony like that attributed to Musaeus, and thought to have been composed in the time of Onomacritus. This poem gave an Orphic cosmogony: there were two

^a Ai §114 ^b Ai §110 ^c A4 ^d A1 ^e A4, Ai §111 ^f B1 ^g A5
^h Ai §114, A4, B10 ⁱ Ai §§114, 115 ^j B4 ^k A2 ^l Ai §§111, 112

original existences, Air and Night, from which was created Tartarus, from these sprang two Titans, who by their union produced the Egg.^a It offered certain variant versions of the legends connected with the Titan Typhō,^b the Harpies (whom it identified with the Hesperides),^c Styx,^d the Eumenides^e and others. It dealt with the story of Endymion (the moon being of interest to Orphic theologians) and depicted him as one who like Ixion had been punished by Zeus for an attempt upon Hera.^f The legend of Epimenides' own long sleep may have been derived from this poem. To Epimenides is also ascribed a pair of verses in which like Musaeus he claims to be of the race of the fair-tressed moon, from which the Nemean lion fell; this is connected with the legend of Heracles.^g There were also verses referring to the Oedipus legend,^h to Oenomaus,ⁱ to Callistō,^j to the legends of the Golden Fleece,^{k, k1} the island of Rhodes,^{l, l1} and the Delphic *Omphalos*: Epimenides was quoted as saying of the last that there was no such thing as the centre of earth or sea, and that the story of the meeting of the eagles was false.^m

There was also extant a prose work on Cretan affairs attributed to Epimenides, but actually of later date, this was used with other authorities by Diodorus in his Fifth Book.ⁿ He may also have used those portions of the Theogony which dealt particularly with Cretan legends,¹ as also did Aratus: for instance, the story of the goat which suckled Zeus when he was hidden in the cave on Mount Ida,^o and of Aigokerōs, the son of Pan and the goat, and therefore the foster-brother of Zeus.^p Aigokerōs helped Zeus in his war against the Titans, by discovering a sea-shell horn the sound of which put them to flight; this sound was called 'panic' because Pan was the father of Aigokerōs. Zeus on assuming power set Aigokerōs and his mother in the heavens.^p Likewise, Zeus placed his attendant nurses in the Arctic circle, having changed them into bears, and himself into a serpent, when warring against

^a B5 ^b B8 ^c B7, B9, cp 9B5 ^d B6 ^e B19 ^f B14, cp 9B26
^g B2 ^h B15 ⁱ B17 ^j B16 ^k B12, B13 ^l B18 ^m B11
ⁿ B20 ^o B21 ^p B24

^{k1 l1} Both these are sun-legends. Acētes is the son of Helios, Rhodes or Rhodē (Rhodes) became the wife of Helios. There is also a desire to bring oriental magic to Greece. Helios bequeathed to his two sons, Acētes and Alōeus, Ephyrā a district of Corinth, and Asopus a district of Arcadia, respectively. See Pauly-Wissowa s.v. Aietes, Vol. I, p. 943.

¹ These are *katastérismoi*, see p. 33 below.

Cronos,^a this is a Cretan story, and is an attempt to link Crete with Arcadia. The two nurses of Zeus in Crete were named Kynosoura and Helikê, which are also the names of two peaks in Arcadia, the link is the cult of Pan, who with his twin brother Arkas was the son of Zeus and Callisto.^b Another part of the poem dealt with the seduction of Ariadne by Dionysus, and his gift to her of a crown made of gold and Indian jewels, by which she was deceived, later, Dionysus placed the crown in the heavens.^c

The most famous reference to Epimenides is that in St. Paul's letter to Titus^d 'One of the Cretans, their own prophet, said of them, "The Cretans are always liars, evil beasts, lazy stomachs".' Paul does not name Epimenides, but Clement of Alexandria, quoting his words, says that the seventh Wise Man in the list of Seven Sages was by some given as Periander of Corinth, by others as Anacharsis of Scythia, and by others as Epimenides of Crete, 'who is mentioned by the Apostle Paul in his letter to Titus'.^e

A late (sixth century A.D.) Byzantine writer, Joannes Laurentius Lydus, attributed to 'followers of Epimenides' the view that the Dioscuri were male and female, equivalent to Time the Monad, and Nature the Dyad, from which spring the creative numbers.^f The explanation is of course Neo-Pythagorean, or Neo-Platonist, but the original novel idea that the twins were male and female probably occurred in the Epimenidean Theogony.

^a B22, B23

^b B16

^c B25

^d I 12

^e B1

^f B26

II ASTRONOMICAL POETRY OF THE SIXTH CENTURY

4 HESIOD

HESIOD of ASCRA in Boeotia flourished probably in the eighth century B.C., perhaps earlier.¹ The author of the poem here ascribed to him wrote probably in the sixth century B.C.

Apart from his *Theogony*, and *Works and Days*, another poem called *Astronomia* or *Astrologia* was sometimes attributed to Hesiod by ancient authors. Plutarch names Hesiod with Eudoxus and Thales as having written on astronomy in verse before Aristarchus and others,^a but this may refer to the *Works and Days*, in which the correct seasons for farming operations are guided by the rising and setting of constellations.^b Similarly Callimachus' epigram on Aratus, in which he says that the latter imitated Hesiod, may refer to the *Works and Days*.^c Athenaeus, however, quoting an earlier authority (Asclepiades of Myrleia in Bithynia, who lived in the second or first century B.C.) mentions a poem called *Astronomia* ascribed to Hesiod, and quotes from it three fragments on the Pleiades.^d So too Pliny, saying that an *Astrologia* exists under Hesiod's name, quotes the author's opinion on the time of the morning setting of the Pleiades as opposed to that of Thales;^e and the Scholiast on Aratus, speaking of 'Hesiod's book on the Stars', quotes some lines on the Hyades.^f These quotations do not occur in the *Works and Days* or the *Theogony*. The poem from which they are taken is lost, and was formerly thought to have been an Alexandrian composition, as this was the epoch during which the myths of the changing of people into stars became popular, but others place the poem in the sixth century B.C., possibly before Thales, on the ground that the time given for the setting of the Pleiades, at the autumnal equinox, as quoted by Pliny, could no longer have been put forward as correct in Alexandrian times.^g

^a A₃ ^b *W and D*, 383 sqq ^c A₂, cp A₁ ^d B₁, B₂, B₃

^e B₄ ^f B₅

¹ See Pauly-Wissowa, s.v. Hesiod, Vol VIII, pp 1173-77

² *Ibid* Vol VIII, p 1223, cp T A Sinclair, *Hesiod Works and Days*, pp 41, 42, notes to lines 383-85

Of the quotations or summaries derived from the supposed Hesiodic poem, some are meteorological, concerned with the times of the rising and setting of the Pleiades; others are mythological, dealing with the personification and naming of the Hyades;^a the legends connected with Callisto, Zeus, their son Arkas or Boötes, and the changing of the mother into the constellation of the Great Bear,^b the story of Orion and the Scorpion,^c of Orion and his attempt to bridge the Straits of Messene,^d and his metamorphosis into the constellation, of which there seem to have been two versions.^e The meteorological fragments are too brief to be of value. The mythological fragment in the Scholiast, the summaries of the Arkas and Orion legends made by the unknown author of the *Katastêrismoi*,^f and the story of Orion given by Diodorus, all obviously come from a poem in which Orphic influence was paramount. The legend of Callisto, Pan and Arkas belongs to that stratum of belief,^g and the story of Orion and the Scorpion is given, in one version, a Cretan setting.^h The Pleiades and Hyades were also of special interest to Orphic mythology.ⁱ It is therefore likely that the poem attributed to Hesiod was a work belonging to the sixth-century Onomacritean cycle, of no interest to astronomy, but concerned only with mystical legends regarding the origins of the constellations.

5 PHOCUS

PHOCUS of SAMOS date unknown.

Phocus of Samos was thought by some to have written the *Nautical Astronomy* which others ascribed to Thales.¹ This work was in verse.¹ Nothing is known of its contents

^a B₅ ^b B₆ ^c B₇ ^d B₈ ^e B₇, B₈ ^f cp J B₁₆ ^g B₇
^h cp 2 B₁₈ ⁱ 11 A₁ § 23 J 11 B₁

¹ Wrongly attributed to the great Alexandrian astronomer Eratosthenes (third century B C) The title means 'The (stories of) establishment of persons among the stars'

6. CLEOSTRATUS

CLEOSTRATUS of TENEDOS lived in the sixth century B C

Cleostratus, a native of Tenedos,^a wrote an astronomical work called *Astrologia*^b or *Phaenomena*.^c A connection between Thales and Cleostratus was indicated by the tradition that Thales died in Tenedos.^d Cleostratus was probably regarded as Thales' successor if not pupil in astronomy.

Although the references to Cleostratus are meagre, they have aroused considerable controversy. Two lines of his poem are quoted by the Scholiast on the *Rhesus* of Euripides,^e together with the views of Parmeniscus,^f but the two lines are not complete, and throw no light on the passage in the *Rhesus* which they purport to explain, so that a line has been inserted between them^g to make up for these deficiencies. Moreover, Parmeniscus' explanation of the passage in the *Rhesus* appears to be wrong. It is therefore difficult to gather what exactly the lines of Cleostratus really meant.^h A reference by Pliny is also obscure.ⁱ

^a A1, A2, A3a, A4, B1, B2, B4 ^b A4 ^c A3 ^d 11 A8 ^e B1 ^f B2

^g Grammarian and commentator on astronomical references in literature. Lived between Aratus (*flor.* c. 270 B C) and Hyginus (*flor.* reign of Augustus)

^h Diels, following Boll

ⁱ The controversy has arisen over the meaning of the term *πρῶτα σημεῖα*. Commenting on *Rhesus* 528, the Scholiast gives Parmeniscus as saying that it meant 'the first parts (*μολπας*) of the Scorpion—since this was what they were called by the ancient scientists—because Boötes begins to set at the same time as they do'. The mutilated fragment of Cleostratus, in which *πρῶτα σημεῖα* are not mentioned, then follows in support of this view. Diels following Boll has therefore inserted a line between the two quoted, giving the sense 'When [he] remains visible for 83 days, the Guardian of the Bear (i.e. Boötes), then the "first signs" (*πρῶτα σημεῖα*) of Scorpion fall into the sea at dawn. The *πρῶτα σημεῖα* are then taken to mean either the 'first stars' of the zodiacal constellation Scorpio to sink below the horizon, or the 'first degrees' of Scorpio regarded as a zodiacal division, i.e. 30° of the ecliptic.

There is however no warrant for supposing that *πρῶτα σημεῖα* was used by Euripides in either of these technical senses, or that the phrase even had any reference to Scorpio, if it had, Euripides' astronomy, or rather that of the soldiers in the play, was at fault. In Euripides, the phrase merely means 'the stars which rose at the beginning of the night, and are now setting' (Paley, *ad loc.*), that is, as the Scholiast himself says, the stars which marked for the soldiers the beginning of their watch. The information given by Parmeniscus that *πρῶτα σημεῖα* was used by 'the ancients' (i.e. presumably, ancient scientists) with particular reference to the 'first points' or 'first degrees' of Scorpio, even if correct, is here irrelevant, and since the lines of Cleostratus he quotes in illustration do not contain the words, we have only Parmeniscus' warrant for believing that Cleostratus used them as he says. The passage in Pliny referring to Cleostratus in which the words *signa* and *prima* are used, unfortunately is so obscure as to throw no light on

All, therefore, that can certainly be said about the work of Cleostratus is that it followed on that of the Milesian scientists: his place is after Anaximander, who is said to have discovered the obliquity of the ecliptic, the zodiacal path.^a Cleostratus then 'explained the signs in it, beginning with the Ram and the Archer',^{b, b1} dealing also with the rising and setting of Scorpio. He was the first to mention the constellation of the Kids. He also was the first to suggest a period of eight years (*oktaetêris*) as a great year, or cycle containing an exact number of days, lunar months and solar years, a discovery generally attributed to Eudoxus of Cnidus. Cleostratus taught Meton the Athenian, who substituted for the eight-year cycle a more accurate cycle of nineteen years.^c

It has been argued by modern scholars¹ that both the division of the ecliptic into the zodiacal twelve signs, and the eight-year cycle, were derived from Babylon, and that Cleostratus merely introduced these into Greece. Pliny's diction is vague, and may mean either that Cleostratus 'understood' the signs as used by the Babylonian astronomers and transmitted them to Greece, or that he was the first to make this use of the constellations as marking the sun's path. An eight-year cycle is said to have been in use in Babylon between 528 and 505 B.C., probably in the time of Cleostratus.² But that Cleostratus did not merely transmit Babylonian calculations, but like Thales and the other Milesians used them for his own scientific ends, seems probable, and we have the testimony of Theophrastus^d that Cleostratus made his own astronomical observations 'from Mount Ida'.³

^a 12A5 ^b B2 ^c A1 ^d A1

^{b1} H. Rackham, Pliny, *NH* II, 31 (Loeb)

¹ E.g. Fotheringham *op cit* (opposed by Webb), Heath *op cit*

² Heath *op cit*, p. xvii

³ This must be Ida in the Troad. Theophrastus' expression Κλεοστράτος ἐν Τενέδῳ ἀπὸ τῆς Ἰδῆς has led some to think that he used Mt. Ida, seen from Tenedos, as a static point in relation to which he could observe the movements of the sun (Fotheringham, *JHS* XXXIX, p. 168). But the other examples, e.g. Φαινὸς Ἀθήνησιν ἀπὸ τοῦ Λυκαβήττου show that Theophrastus means that Cleostratus though living on Tenedos conducted observations from Ida.

πρῶτα σημεῖα in Cleostratus. See the lengthy discussion between J. K. Fotheringham and E. J. Webb in *JHS* XXXIX (1919) 164 sqq., XLI (1921) 70 sqq., XLV (1925) 78 sqq., the succinct account of Cleostratus by W. Kroll in Pauly-Wissowa, Suppl. IV p. 912, and the remarks of Heath, *Greek Astronomy* (1932), pp. xiv, xix.

III. EARLY COSMOLOGICAL AND GNOMIC PROSE

7. PHERECYDES OF SYROS

PERECYDES of SYROS: date uncertain: he may have lived in the seventh century, or the middle of the sixth century B.C.

Tradition regarding the date at which Pherecydes of Syros lived is contradictory. Some placed him in the time of the Seven Sages, that is, in the latter half of the seventh century,^a of these, some said that he was a pupil of Pittacus (whose prime of life is given as 612 B.C.),^b others that he took the side of Ephesus in the war against the Magnesians, that is, in the middle of the seventh century.^c Others, however, made him the teacher of Pythagoras, and placed his prime of life in the middle of the sixth century. Eusebius gives an exact date, the fifty-ninth Olympiad (554-1 B.C.)^d and Cicero, following this tradition, says that Pherecydes flourished in the reign of Servius Tullius (578-535 B.C.)^e Diogenes Laertius records both traditions, apparently without realizing their inconsistency.^f

It seems probable that the earlier date is correct. The late date appears to have grown out of a desire to connect Pherecydes with Pythagoras: the similarity between certain of their doctrines made it natural to suggest that Pythagoras was Pherecydes' pupil, and the date was probably altered to make this possible. This may have been helped also by a confusion between Pythagoras the philosopher, and Pythagoras the tyrant of Ephesus, in whose time Pherecydes probably lived, that is, in the middle of the seventh century.^g The connection between Ephesus and Syros was probably intimate: both were colonized by Athenians in legendary times, Ephesus by Androclus son of Codrus,^h and Syros by an otherwise unknown Hippomedon.ⁱ The island may at one time have been a bone of contention between Ephesus and Samos: one of the few recorded facts about Syros is that it was 'betrayed' by one Killikon into the possession of Samos, though no date is assigned to this event,^j and the wars between Ephesus and

^a A2, A2a ^b A1 §116 ^c A1 §§117, 118 ^d A1a, A1 §121 ^e A5

^f A1 ^g Müller, F. H. G. IV, 148 (Baton, Frg. 2), cp. A1 §§117, 118

^h Strab. XIV, 640 ⁱ Eustathius, Comm. on Dionysius Periegetês 525

Samos were matter for legend.^a Pherecydes, according to the tradition placing him in the seventh century, sided with Ephesus (where he was then living) in their war against the Magnesians, and was buried by the Ephesians in territory conquered from the Magnesians.^b It is thus probable that his name was connected in some way with Pythagoras tyrant of Ephesus, and this may have helped the growth of a legend connecting him with Pythagoras of Samos.

The only anecdote told of their connection is that of the death of Pherecydes. According to this, Pherecydes was wasting away with *phetrias* (*pediculosus*, louse-disease) on the island of Delos, Pythagoras journeyed thither, tended him as a son would a father, and buried him there.^c The anecdotists, however, were uncertain when this happened. some placed it at the time of Pythagoras' residence in Croton, and even caused the plot against the Pythagoreans to take place during Pythagoras' absence with Pherecydes,^d others, aware of the discrepancy in time, said that Pherecydes died before Pythagoras migrated from Samos.^e Other traditions regarding Pherecydes' death were current, one being that he flung himself from the Corycian rock at Delphi.^f It seems more likely that the tradition which showed his tomb in a district conquered by Ephesus from Magnesia, a tomb revered later by generations of Ephesians, is correct, and that therefore Pherecydes lived in the seventh century. Andron of Ephesus, writing of Pythagoras, tried to bridge the difficulties by saying that there were two men called Pherecydes, both of Syros: an astronomer, and a theologian who taught Pythagoras, but Eratosthenes rightly denied this.^g The only other Pherecydes known to fame was the Athenian genealogist, who lived in the first half of the fifth century.^h

Nothing is known of the life of Pherecydes. He was said to have had no teacher, but to have taught himself from the secret books of the Phoenicians.ⁱ This may have originated from Eumelus' story of the descent of the Phoenicians on to the island of Syriê, in the *Odyssey*,^j Syriê being identified with Syros. He travelled, lived in Samos and Ephesus, visited Messene, Olympia, Sparta, Delphi.^k He corresponded with

^a Paus VII, 2, 8

^b A1 §§ 117, 118

^c A1 § 118, A4

^d A4, ch 14 (Pythagoras) 16

^e A4

^f A1 § 118

^g A1 § 119

^h A3

ⁱ A2

^j XV, 403 399

^k A1 § 116

Thales,^a whose fame he endeavoured to rival.^{b, b1} He was credited with having prophesied a shipwreck, an earthquake, the capture of a city; but Andron said that these prophecies were the work of Pythagoras, and were falsely attributed to Pherecydes by Theopompus.^c

Pherecydes is classed with Pythagoras and Thales as among the first of the Greeks to philosophize about things heavenly and divine.^d He was also thought to have been the first to write in prose.^e His book was preserved in antiquity; it was called *Heptamychos*, the Seven-Chambered (Cosmos), or *Theocrasia*, the Divine Mingling, or *Theogonia*^f (the *Theologia* in ten books spoken of by Suidas as a separate work is probably the same, unless it is a confusion with the work of Pherecydes of Athens), the book professed to deal with the divine origin of the universe. It was written in an Ionian dialect,^g and in an enigmatic or allegorizing style.^h

Pherecydes, in spite of attempts to connect him with Thales and Pythagoras, was not an astronomer, he wrote an allegory of creation, beginning with the sentence, 'Zas (Zeus), Chronos (Time) and Chthoniê always existed, but Chthoniê acquired the name Gê (Earth) because Zas gives her Earth as a (wedding) present'.ⁱ

The wedding of Zas and Chthoniê is described in detail in a recently-discovered passage,^j of which only a sentence quoted by Clement of Alexandria had been known before the discoveries of papyri by Grenfell and Hunt at Oxyrhynchus. This is the only considerable fragment of Pherecydes' work extant, and it gives a good idea of his style. For Zas before his wedding houses many and great are prepared, and furnished with all that is necessary, including servants. The wedding is then celebrated. Three days after the marriage, Zas makes a robe, large and fair, and on it he embroiders Earth and Ogenos (Okeanos) and the palace of Ogenos. In making this gift to Chthoniê, he addresses her as his wife, saying, 'In my desire that your marriage (with me) should exist, I honour you with this gift'. This, the author notes, was the origin of the first 'unveiling ceremony', when the bride exchanged her maiden

^a A1 §121^b A2^c A6^d 11A11, A1 §116^e A1 §119^f A2^g B10, B11^h A12ⁱ B1^j B2^{b1} Thales' prime of life is given as 58½ B C, so that this too may be an anachronism

veil for her husband's wedding-gift. The reply of Chthonië on receiving the robe is then given; but here the papyrus breaks off

Such then was Pherecydes' allegory of creation. Commentators note that Zas, Chronos and Chthonië are the three primary elements, that is, Fire, Aether or the Sun, the creative element, Earth, the subject or material on which he works; Chronos, Time, that in which the things created exist.^a Chronos, however, was sometimes thought to be a person also, from whose seed sprang fire, breath and water,¹ these, divided into five compartments, gave rise to a vast array of other gods. the five-fold division was called *Pentemychos* or *Pentecosmos*. Some commentators identified Chronos with Cronos, but whether this was said by Pherecydes or is a theory of his interpreters is not clear. The stages of the allegory seem to be as they are given by Maximus of Tyre^b first Zeus the 'original creator, with Chthonië and Chronos,^c nothing then existed but a state of flux called Chaos, afterwards equated with the Water of Thales.^d Then came the union of Zeus and Chthonië, and the creation of an Earth and an Ocean-stream,^e the Robe, with Tartarus below,^f Zeus as creator changes into Eros in order to bring warring elements into harmony in a Cosmos.^g From the seed of Zeus (who is also Cronos) arise the warring elements, fire, breath, water; or as Pherecydes allegorizes, the race of Titans led by the giant-serpent Ophioneus.^h The two armies, one led by Zeus-Cronos, the other by Ophioneus, confront each other, there are challenges and combats, and a pact is made that whichever army is driven into Ogenos (Ocean) shall have lost the battle. Thus the Titans are expelled from the upper regions to Tartarus below, and Zeus-Cronos (Saturn) is crowned king,ⁱ that is, he banishes the forces of lawlessness to the underworld and establishes the reign of law in the Cosmos. The realm of Tartarus is guarded by the Harpies and Whirlwind, daughters of Boreas, and any offending deities are exiled there.^j

Besides the Robe, the physical appearance of the varied world created by Zeus, there appears another symbol more

^a A₉ ^b A₁₁ ^c A₇ ^d B_{1a} ^e B₂ ^f B₄ ^g B₃ ^h B₄

ⁱ B₄ ^j B₅

¹ Some suggest that the creation of the inorganic elements from the seed of Chronos is opposed to the creation of the gods by Zeus turned Eros. See Fritz in Pauly-Wissowa
^j v Pherecydes (Mythograph) XIX, 11, 2031

difficult to interpret. the 'Winged Oak' or 'Tree'.^a It has been suggested that this is the upright of the loom on which the Robe is woven, or that it is the mast of a ship, the ship being the earth which floats on water as Thales says, but in the absence of the context, the inquiry is fruitless. Other scraps of information about Pherecydes' doctrine are equally difficult to fit into an intelligible whole: interpreters saw in them what they wished. Phoenician, Babylonian and Egyptian mythology,^b as well as the later doctrines of the physical philosophers.

The influence of Orphism on Pherecydes is clear from his reference to the Titans and the Robe. He professed to have knowledge of the names,^c language^d and life^e of the gods. He taught the doctrine of metempsychosis: some credited him with having been the first to do so, or as Cicero puts it, having been the first to say that the souls of men are immortal.^f These also said that he was the first to describe the nature and origin of the gods; they evidently regarded him as belonging to legendary times, like Orpheus and Musaeus. He described the births and deaths of the soul in allegorical language, speaking of 'hollows, pits, caves, doors and gates'.^g The Cosmos itself was a cave, and the universe was divided into first five,^h then seven 'chambers', hence the title of his book, *Heptamychos*.ⁱ The exact topography of the soul's journeys according to Pherecydes can only be conjectured; probably the features of the underworld were given an allegorical meaning.^k His teachings were often confused with those of Pythagoras; in fact, Pythagoras' fame seems to have swallowed up that of Pherecydes, though supporters of Pherecydes tried to vindicate his originality.^l His allegorical description of the warring elements was thought to have influenced Heracleitus,^m while those who place Pherecydes in the sixth century believe that his work was influenced by Anaximander. His allegory of the cosmic 'chambers' may have suggested Plato's metaphor of the cave; their styles were sometimes compared, Plato's being said to be less enigmatic than that of Pherecydes.ⁿ

Aristotle ranks Pherecydes as one of the 'mixed' theologians, that is, one who did not state his views entirely in mythical form; he notes that like the Magi, Pherecydes identifies his original creative force (Zeus) with the highest good.^o

^aB2 A11 ^bB4, 11A11 ^cB1, B9 ^dA1 §119, B12 ^eB13a ^fB8, cp ch 14, 8
^gA2, A5 ^hB6 ⁱA8 ^jA2 ^kB7 ^lA6 ^mB4 ⁿA12 ^oA7

It is clear that the work of Pherecydes was confined to an allegorizing account of creation; he contributed nothing to science. A *Héliotropion* (that is, a point which, seen from another fixed point, marked the rising of the sun on the longest day of the year, and round which the sun's risings seemed to revolve) said to have been used by Pherecydes was preserved on the island of Syros, but this tradition probably arose from the lines in the *Odyssey*^a regarding Syriê. He made no scientific observations himself, but used the theories beginning to be evolved by the predecessors of Thales^b to give a new meaning to old stories.

8 THEAGENES

THEAGENES of RHEGIUM lived in the time of Cambyses^c (529-522 B.C.)

Theagenes was the first scholar known to have applied the allegorical method of interpretation to Homer. Influenced by the Ionian theory of Opposites, he explained the disputes of the gods as representing the opposition of the elements or of qualities. fire-water, hot-cold, light-heavy. Fire is symbolized by Apollo, Helios, Hephaestus, water by Poseidon and Scamander, the moon by Artemis, air by Hera, and so on. So too with abstract qualities. Athene represents wisdom, Ares folly, Aphrodite desire, Hermes reason^d. Besides beginning this type of literary criticism, he appears also to have written about Homer's origin and epoch,^e and to have been one of the earliest to undertake linguistic and grammatical criticism.^f

9 ACUSILAUS

ACUSILAUS of ARGOS lived probably in the sixth century B.C.

Acusilaus was sometimes included in the list of the Seven Sages^g. He wrote a prose work on the origins of gods and men, called *Genealogies*,^h in at least three books.ⁱ This work apparently survived until Hadrian's day, when the scholar Sabinus wrote a monograph on Acusilaus among others.^j Some re-

^a XV, 404

^b 11B1, line 5

^c 1

^d 2

^e 1

^f 12

^g A1

^h A2

ⁱ B32, B28

^j A5

garded the book attributed to Acusilaus as forged.^a Its claim to special knowledge of divine origins led some to say that he had copied it from bronze tablets found by his father when digging near his home,^b but it bore likenesses to other works of a similar nature, especially Hesiod, so that others accused Acusilaus (and Eumelus) of having transcribed the poems of Hesiod into prose, and published the result as their own work.^c The extracts which survive show that the correspondence of the views of Acusilaus with those of Hesiod was frequent,^d though not invariable.^e

The work of Acusilaus was of little or no importance to philosophy, it belongs rather to literary criticism. He sometimes echoes, sometimes emends or expands, the versions of legends given by his predecessors. He agrees with Hesiod in making Chaos the primary existence,^f but whereas Hesiod derives Eros from the union of Chaos and Earth, Acusilaus causes Chaos to divide into two, Erebus the male principle, Night the female, and Eros to spring from their union, as well as Aether and Mêtis.^{g, g¹}

The origin of monsters such as the male and female Titans,^h hundred-armed giants, Cerberus, Typho and othersⁱ was discussed, and their battles with Zeus recounted. Zeus flung them into Tartarus,^j from the blood of Typho sprang all creatures that sting.^k Apollo also was threatened with this penalty, but was saved by the prayers of Leto and made to serve a human being, Admetus, instead.^l Others slain by Zeus were Asclepius,^m whose mother Corônîs,ⁿ like Semele, was burnt in the fire by a god (Apollo),^o Actaeon, who attempted to woo Semele, and Kaneus, changed from woman to man, made invulnerable, and then slain on the orders of Zeus by the Centaurs.^p

The legend of Heracles was also discussed,^q his labours, his death on the funeral pyre,^r he and not the Harpies slew the winged brothers Zêtês and Calais according to Acusilaus.^s The

^a A₁ ^b A₂ ^c A₄ ^d B₂, B₆, B₁₀, B₁₂, B₂₃, B₂₅, B₃₀ ^e B₂, B₃, B₁₄, B₁₁

^f B₁ ^g B₁ ^h B₄ ⁱ B₆ ^j B₇, B_{9a}, B_{9b}, cp. 7B₅ ^k B₁₇ ^l B₁₀

^m B₉ ⁿ B₃₉ ^o Pind. *Pyth.* III ^p B_{40a} ^q B₁₅ ^r B_{9c} ^s B₁₉

^{g¹} Plato in the *Symposium* makes Phaedrus say (with a vagueness perhaps deliberate) that Acusilaus agrees with Hesiod in making 'these two, Earth and Eros' come into being after Chaos, this is merely part of the argument that Eros is one of the oldest of the deities (B₂ *Symp.* 178B). The Scholiast on Theocritus says that Acusilaus made Eros the son of Night and Aether (B₃)

voyage of the Argonauts belongs in part to the same legend: the story of Phrixus was examined,^a and the Fleece itself was said to have been not golden but dyed purple by the sea,^b a touch of rationalization such as is not found elsewhere in the remaining fragments. The Trojan War was analysed, and a new explanation given for its outbreak Aphrodite, having learnt by an oracle that the sons of Anchises would rule the Trojans after the fall of the house of Priam, united with Anchises, and then arranged the abduction of Helen in order to bring about the defeat of Troy, though she pretended to aid ° The offspring of Menelaus and Helen were discussed,^d and various incidents of the war, such as the winning of Eurypylos to the Trojan cause by a bribe to his mother ° The colonization of Ithaca,^f the origin of the Phaeacians,^g and of the Homeridae,^h appear to have been mentioned in annotation of Homer.

A special interest seems to be displayed in legends about the winds. the Harpies, who, he agrees with Epimenides, guard the apples of the Hesperidae,ⁱ Zetes and Calais,^j Boreas and Oreithya,^k Acusilaus agrees with Hesiod that there are three chief winds, Boreas, Notos and Zephyr.^l River-legends also were specially dealt with Asopus,^m Achelous ° The story of the Flood, and the part played by Deucalion and Pyrrha, was recounted ° it took place during the reign of Phorôneus at Argos.^p Acusilaus paid particular attention to legends connected with his native Argos and the Peloponnese: the legends of Phorôneus,^p Argos, Pelasgus,^q Mycèneus,^r were discussed, and the cult of Hera was given special importance; the madness of the daughters of Proetus of Argos was ascribed to their having set themselves above the statue of Hera, not to their having neglected the rites of Dionysus.^s The story of Io^t likewise belongs to the vengeance of Hera Endymion^u was a wooer of Hera according to one version,^v though this is not ascribed to Acusilaus The legend of Proteus, Phorcys and the Kabeiroi^w belongs in part to the Argonaut cycle, Phorcys, according to Acusilaus, was also the father of Scylla, by Hecate.^x

Very few actual quotations from Acusilaus survive the longest is that on Kaineus, preserved in a papyrus found at

^a B25 ^b B29 ^c B31, B32 ^d B17 ^e B34 ^f B36 ^g B28 ^h B22
ⁱ B5, 3B9 ^j B19 ^k B35 ^l B30, Hes *Theog* 870 ^m B18 ⁿ B21
^o B33, B38 ^p B20 ^q B11, B13 ^r B24 ^s B14 ^t B12 ^u B26
^v Schol *ad Theocr* III, 49 ^w B8, B40 ^x B27

Oxyrhynchus.^a The majority of the references are annotations of scholars on other writers. Disjointed as these are, they nevertheless reveal that Acusilaus was interested in the legends as such, and not in any philosophical or allegorical interpretation of them

IO THE SEVEN SAGES

THE SEVEN SAGES lived in the latter half of the seventh, and the early sixth, centuries B C

The so-called Seven Sages represented the practical wisdom of early Greece: they were, as Dicaearchus said, not philosophers or sages, but men of shrewd intelligence, concerned with the administration of public affairs.^{b, b¹} The names in the list varied: the earliest list is that of Plato in the *Protagoras*^c — Thales, Pittacus, Bias, Solon, Cleobulus, Myson, Chilon, where for the usually-included Periander the almost unknown Myson is substituted, doubtless because of Plato's hatred of tyranny. Diogenes Laertius gives Thales, Solon, Periander, Cleobulus, Chilon, Bias, Pittacus, saying that others add Anacharsis, Myson, Pherecydes, Epimenides, and some even Peisistratus.^d Many other names were suggested for inclusion by local patriotism or political bias, a further list is given by Diogenes Laertius collected from various authors, and amounting to twenty-three names. Of these, four were universally agreed upon. Thales, Bias, Pittacus, Solon, the rest could be chosen according to taste.^e

Round the Wise Men a considerable body of stories grew up, based on a desire to bring them into contact with one another and cause their wisdom to be displayed. Apart from the meetings of individuals, they were said to have met in a body by invitation of Cypselus, or Periander, or Croesus, and to have held conferences at Panionium and Delphi.^f The meeting at Corinth under the patronage of Periander was made the subject of a dialogue by Plutarch. The best-known story told of them is that of the golden tripod drawn out of the sea by fisher-

^a B40a (Ox Pap XIII, No 1611, pp 127 sqq) ^b I §40 ^c 2 (*Protag* 141D)

^d Diog L *Prooem* 13 ^e I §42 ^f I §40

^{b¹} Thales was a philosopher, but as a member of the college, he is treated merely as a sage, and his maxims are indistinguishable from those of the others. He was credited also with political interests and influence (11A4)

men; its ownership was disputed, and the Delphic oracle when consulted said 'Give it to the wisest'. After being sent to the Wise Men in turn, it was given back to Apollo at Delphi or elsewhere. The story had many versions, and there seems to have been a mass of literature about it.^{a, a1}

On their visit to Delphi they were said to have offered up to Apollo the first-fruits of their wisdom. the two maxims 'Know thyself' and 'Nothing too much', which were then inscribed on the porch of his temple there. These maxims were doubtless the work of the Delphic priesthood; but in later times, when the Sages were thought of as a college embodying the highest wisdom of sixth-century Greece, it became the custom to attribute to them all wise sayings. Sometimes the different maxims were assigned to particular authors. Solon, whose moderation was his most striking characteristic, was credited with the invention of 'Nothing too much'.^b 'Know thyself' was attributed to the Spartan Chilon, or to Thales.^c It seems likely that the story of their symposium at Delphi owes its origin to a desire to make them the authors of the temple maxims.

Plato described the wisdom attributed to the Sages as 'brief memorable phrases', and 'Laconian brevity of speech'.^d Stobaeus in his *Anthology* gives a collection of these sayings^e made by Demetrius of Phalerum, under the names of Cleobulus, Solon, Chilon, Thales, Pittacus, Bias, and Periander. They lay stress on the moral virtues of self-control, honesty, industry, truthfulness, obedience to the laws, respect towards parents, and on common sense in general. The collection does little to reflect the known character and work of each of the supposed authors: the maxims of Solon differ little from those of Pittacus or Thales or Periander; Periander is even credited with the saying that 'democracy is better than dictatorship'.^e They were intended as a practical guide to life for the prudent man and good citizen, that the two Delphic maxims acquired an importance for philosophy was due to the work of Socrates, who developed 'Know thyself' into 'Virtue is Knowledge', and of Plato and Aristotle, who developed 'Nothing too much' into the doctrine of the Mean.

^a Diog. L. I, 28

^b 31

^c 71, cp. 11A1 §40

^d 2

^e 36

^{a1} Freeman, *Work and Life of Solon*, pp. 195, 196

¹ The oldest collection of the sayings (without the names of the Sages) is to be found on a stone tablet probably intended for school use, of the third century B.C. (Dittenberger, *Sylloge inscr. gr.* III, n. 1268)

**B. THE FRAGMENTS
OF THE PHILOSOPHERS OF THE SIXTH AND
FIFTH CENTURIES (AND IMMEDIATE
SUCCESSORS)**

B. THE FRAGMENTS

OF THE PHILOSOPHERS OF THE SIXTH AND FIFTH CENTURIES (AND IMMEDIATE SUCCESSORS)

II. THALES

THALES of MILETUS was in his prime about 585 B.C

The chief sources of information concerning his life and work are:

(a) Herodotus, who records his prediction of the eclipse of the sun that put an end to the war between the Lydians and the Medes,^a his advice to the Ionian cities to found a federal state with headquarters at Teos,^b his theory that the flooding of the Nile was due to the blowing back of the waters at the mouth by the Etesian winds,^c and the tradition (disbelieved by Herodotus) that he enabled Croesus to transport his army across the river Halys by diverting the stream.^d

(b) Aristotle, who in the *Metaphysics* calls him the founder of philosophy, and records his doctrine that the primary substance is water,^e in the *de Caelo*, that the earth floats on water;^f in the *de Anima*, that all things are full of gods — the magnet has life, since it can move iron,^g in the *Politics*, that tradition ascribed to him a money-making trick, the corner in olive-presses.^h

(c) Plato, who tells the anecdote of his falling into a well while studying the stars,ⁱ and quotes his saying, 'All things are full of gods', but without giving his name.^j

(d) Doxographers. There is a Life of Thales in Diogenes Laërtius; a paragraph in Suidas, statements in Simplicius, Aëtius, Proclus, Galen and others; a succinct summary by the scholiast on Plato's *Republic*. These state that he was a distinguished astronomer and mathematician — for example, that he

^a A5 ^b A4 ^c A16 ^d A6 ^e A12 ^f A14 ^g A22
 ^h A10 ⁱ A9 ^j A22

knew the true cause of eclipses of the sun;^a that he first discovered the constellation Little Bear,^b that he introduced geometry from Egypt into Greece,^c having assimilated practical propositions such as how to measure the distance of a ship at sea, and the height of a pyramid by its shadow,^d and having also arrived at some abstract theorems concerning triangles and circles ^e

Whether Thales himself set down his views in writing is not known, and was not known in antiquity. Some said that he left nothing, others that he wrote a work on *Nautical Astronomy*;^f others ascribed to him a work or pair of works *On the Solstice* and *On the Equinox*; others a book on *First Causes*.^g The work called *Nautical Astronomy* so doubtfully ascribed to him was in verse,^h others ascribed it to Phocus the Samian.ⁱ A passage in Galen purports to quote roughly a sentence from the Second Book of the work called *On First Causes*, which ends with a reference to the First Book. 'Water is the substrate, and all things are derived from it, the manner has already been described by me in Book One.'^j But another tradition stated that Anaximander was the first of the Greeks known to have been so bold as to publish a written work on Nature.^k Aristotle, when describing Thales' views, gives no reference, and not knowing the reasons given by Thales for choosing water as the substrate, he supplies his own conjecture.^l Therefore either Thales wrote nothing, or his works did not long survive.

We can accept the unanimous testimony that Thales was the first of the philosophers; but much discussion has arisen over the exact nature of his originality. The sources tell us that he learnt geometry from the Egyptians, and was, like his successors, 'a pupil of the Egyptians and Chaldeans'.^m Thus he evidently owed much to others in the two sciences in which he was distinguished. The question is, was the material collected by the Babylonians and Egyptians in any way scientifically arranged or analysed already; or was it a record of data and practical rules only? Nothing has so far come to light to prove that the Babylonian collection was anything more than a record of phenomena made for religious purposes, or that Egyptian

^a A₃, A_{17a}^b A₁ §27, A_{3a}, A₃^c A₁₁^d A₂₁, A₁ §26^e A₁ §24; A₂₀^f A₁ §27, B₁^g A₁ §27^h B₁; A₂ⁱ A₁ §27^j B₁^k I₂A₇^l A₁₂^m A₁₁

geometry was anything more than certain equations and instructions for measuring land and laying out buildings. Therefore the view stands firm that Thales and his group, while using these data, introduced the scientific way of arranging them, drawing from them generalizations, which could in turn be usefully applied.^a

This does not mean, however, that the particular discoveries in these sciences attributed to Thales were really his. For instance, that he knew the true theory of solar eclipses^b is almost certainly wrong, for his successor Anaximander, who must have associated with him, held a complex and fantastic theory^c that must have fallen before the correct one. Thales foretold an eclipse, as he could do by studying the Babylonian records, and therefore the explanation of the phenomenon was attributed to him.

It does not mean, either, that his science was entirely 'pure', that is, non-utilitarian. Why should it be? Whether scientific theory can accompany or grow out of practical purpose depends on the nature of the purpose. That of Thales, it is clear, was the assistance of navigation and husbandry, by means of a study of climate, or more widely, a study of celestial phenomena. This is shown, for example, in the title of the book ascribed to him — *Nautical Astronomy*, in the tradition that he discovered the constellation Little Bear;^d and perhaps in the anecdote about the corner in olive-presses,^e the success of which depended on the ability to forecast a good olive harvest. The anecdote, as Aristotle remarks, really describes a financial device of general application, which became attached to the name of Thales because of his reputation for wisdom, but its nature probably points to Thales' known interests as a meteorologist. Further, he was interested in the rise and fall of the Nile, on which the Egyptian harvests depended, and in the possible effect of seasonal winds on it.^f Tradition suggested that he wrote on the Equinox and the Solstice, times at which the weather phenomena are striking, and that he studied the Hyades,^g stars famous for issuing in rainy weather. These studies — meteorology and physical geography — predominated at Miletus, which was famous for its exploring and colonizing seamen, and which later produced the geographer Hecataeus

^a A11^b A3, A17^c See p. 61^d A1 §23, A3^e A10, A1 §26^f A16^g B2

Some ancient writers^a were content to call Thales simply the first of the scientists, but scholars of the Aristotelian school were well aware that though his was the first name connected with scientific research, he had had many predecessors, but had put them all in the shade by his superior ability.^b

Aristotle himself has given Thales the title of 'the founder of this kind of philosophy',^c that is, of the kind that poses and seeks to answer the question 'What is the reality behind phenomena?' It is in this that his originality lies. He chose as his substrate Water, one of the four substances then believed to be elements, for he believed that the substrate was One, not several; and it did not occur to him, or to his successors in Miletus, that the substrate could be other than material. Aristotle conjectures as his reasons for this choice that he saw the essential part played by water in nourishing life, so that the hot element could come from it, since what is alive has heat, water is also the essence of seeds. Modern scholars such as Burnet¹ have suggested that Aristotle was mistaken in this conjecture, because the science of biology had not become pre-eminent in Thales' day, as later it did, and that since Thales was clearly interested in climate, his choice of water was governed by this study: he saw the transformations which water underwent into solid ice, and also into mist and vapour, the latter to the early scientists was Air, and therefore of the same composition as wind, breath, life. On a point where Aristotle had to fall back upon conjecture, nothing can be affirmed with certainty, but there are reasons for thinking that Aristotle's conjecture is the more likely: one is that biology was undoubtedly keenly studied in the Milesian School, for Anaximander, Thales' successor, had some striking views on the origin of life, among which was the theory that all living creatures arose from the moist element.^d This theory was, in Anaximander's teaching, developed in a remarkable way; it is therefore not unlikely that the idea originated with Thales. Again, Thales was interested in the flooding of the Nile, a striking instance of the effect of water on germination, it may well have seemed to him that the water actually germinated the life. Aristotle's view is therefore to be preferred.

Aristotle further suggests^e that Thales may have been influ-

^a A1 §24

^b B1

^c A12

^d 12A11, 30, see p. 62

^e A12

¹ *Early Gk Phil* Edn 4, pp. 48-9

enced by mythology, which makes Ocean and Tethys the first parents of all things; there was also a suggestion that he found this idea in Egyptian mythology ^a

It is not known whether he dealt with the problem of change, that is, whether he tried to explain the process by which all things are derived from water. There is a suggestion that he spoke of processes such as mixing,^b but this is clearly because no explanation known to be his survived.

He did attempt a cosmology. he said that the earth floated on water ^c. Cosmology, though it always accompanies these early speculations, is not metaphysics, it is an attempt to explain the relations between earth, the other heavenly bodies, and space. Thales, Aristotle says, chose water to support the earth because things like wood and so on can float in water but not in air, he should have applied the same reasoning to the supporting water ^d. Again it is suggested that he was influenced by Egyptian mythology.^e Seneca has it from some unknown source that Thales thought that Earth floated about like a ship, and that it is the tossing about on the water we feel when there is an earthquake; however, he thinks this explanation 'inept' ^f. It is possible that Thales thought of the earth as growing in the water: growth depends on moisture, and all things are nourished by that of which they are composed ^g. This again would show a biological leaning.

'All things are full of gods' ^h. This phrase, which seems to be a quotation, is given by Plato as well as Aristotle, though in the former not under Thales' name. From Aristotle we learn that he said that the magnet had life, or soul, since it could move iron, therefore he thought that life or soul was that which made things move. (He was credited with the idea, often expressed by later philosophers, that the soul is in its essence ever in motion and self-moving.)ⁱ Elsewhere it is said that he derived this view from studying amber as well as the magnet ^j. If so, then he must have experimented, for amber becomes active only when rubbed with certain materials. It has been thought odd that he should posit 'life' in all inanimate objects on the strength of the magnet, which was a unique manifestation, but if he treated amber and got the same manifestation, it may be that he thought that all objects had the same power if one knew

^a A11, cp A14 ^b A13a, b, B3 ^c A13, A14, A15 ^d A14 ^e A14
^f A13 ^g A15 ^h A22 ⁱ A22a, 24A12 ^j A1 §24, A3, below, p 385

how to evoke it, and that he therefore thought that the whole Cosmos was a living thing, nourished by the life-giving water of which it was composed, and that each particular object in it was likewise alive. He was called by some an atheist; but tradition shows him to be a pantheist, seeing the life-force, which he equated with the divine, in the Whole and in every part. It is rash to denude him of this idea on the ground that later thinkers also held it, and it accords well with the interest in life and growth that Aristotle ascribes to him.

The anecdotes about his feats, though not to be accepted too readily, go on the whole to show that tradition regarded him as a man of great practical ability. He was, it is true, one of the Seven Sages, he figures in the tripod-saga,^a and legend has gathered about his name, as about those of the others. Still, these legends may retain some faint imprint of the character of the man to whom tradition attached them, those of Thales are not the same as those of Solon or Bias, and they have an internal consistency or similarity. There is only one story which shows him in the rôle of unpractical dreamer—that of his falling into the well, brilliantly told by Plato in the *Theaetetus*,^b and less agreeably by Hermippus,^c this looks like an Athenian story of Periclean date, for it was then that the ordinary man began despising philosophers as absent-minded and unbusiness-like. The story of Thales' *coup* in the business world, the corner in olive-presses,^d had as its moral 'that a philosopher can make money if he likes, but is otherwise engaged'; this looks as if it were invented by the other side. Even Herodotus believed that Croesus took his army over the existing bridges of the river Halys and did not need the help of Thales.^e But true or not, the stories fill out the picture of him as a man of practical as well as speculative ability, and the story that he advised the Ionians to band together into a nation shows that he was regarded as a leader of political as well as scientific thought. He was also said to have favoured an alliance with Cyrus rather than Croesus, and so to have saved Miletus.^f

In the saga of the Seven Sages, he was accorded the rôle of defender of celibacy and childlessness,^g as opposed to Solon who upheld the joys of marriage and family life, Solon was said to have visited him at Miletus, when Thales played a trick on

^a A1 §27 sqq^b A9^c A1 §34^d A10, A1 §26^e A6^f A1 §25^g A1 §26

him to prove his point.^a The sayings attributed to him in Diogenes Laertius and Stobaeus are not authentic.^b He is said to have died in old age, of heat, thirst and the pressure of the crowd when watching an athletic contest. His prime of life was fixed by chronologers at 585 B.C., the date of the eclipse, and the date of his death, as was customary, about forty years later. The date of his birth was usually fixed at forty years before the prime (a man's prime being reckoned as forty years of age), but in Diogenes Laertius,^c quoting Apollodorus, Thales' birth is placed in 640 B.C., and his death, at the age of seventy-eight, in the 58th Olympiad (548-5), so that there is a mistake either in the report or in the text, probably in the former, as the writer immediately adds that Sosicrates gave Thales' age as ninety when he died. Diogenes Laertius is full of blunders, there can be no doubt that what was intended was 625 B.C., forty years before the eclipse. All these dates are equally artificial, being based on the 'prime' at forty years of age which was fixed arbitrarily by Alexandrian chronologists at the most outstanding or easily-dated event in a man's life.

12 ANAXIMANDER

ANAXIMANDER of MILETUS was in his prime about 560 B.C.

The chief sources are Aristotle, and the doxographers, who several times directly quote Theophrastus. The Life in Diogenes Laertius is short and incomplete, and lacks the usual anecdotes. Anaximander's views are therefore reported in the language of the Peripatetic School, whereas the only surviving sentence definitely quoted as his is worded poetically, as the reporter observes.^d

There seems little doubt that he left writings. The titles given in Suidas^e are of little value, but in Simplicius, drawing on Theophrastus, a sentence purporting to be his actual words is quoted.^f There was a tradition that he was the first Greek to venture to publish his scientific views in writing.^g

He is called 'pupil', 'associate', 'successor' of Thales,^h and there can be no doubt that his speculations carry on those of Thales, sometimes developing them (as for instance the theory

^a Plut. *Sol.* VI ^b A1 §35, ch. 10, 36 ^c A1 §37, A2, A7 ^d A9, B1
^e A2 ^f A9, B1 ^g A7 ^h A2, A4, A6, A9, A10, A11, A17

that life came from the moist element), sometimes intended as corrections and improvements on them. The Milesian scientists carried on their work all through the sixth century until the destruction of their city in 494 B.C., Anaximander was the most outstanding of his generation. His prime of life is therefore given by the Alexandrian chronologists,^a in default of any more striking event, as twenty-five years after that of Thales, and about twenty-five years before that of Anaximenes.

He said that the primary substance was not any one of the Four Elements, but 'some different kind of substance', which he called the *Apeiron*,^b the Non-Limited, he appears to have had to invent a name for his new concept.^c

This concept, unlike Thales' choice of a substrate, seems to have been arrived at logically, for though the Non-Limited was material and therefore perceptible, it was removed from our perceptions by being out of reach. Moreover, it was put forward as an emendation of Thales' view. Anaximander conceived of the Four Elements as pairs of opposite qualities, Hot-Cold, Wet-Dry, and therefore he postulated a primary substance from which these pairs could be derived: something in which they were all mixed together, and which therefore had not the quality of any one of them. Thus the Non-Limited was neutral in quality,^d a logical idea arrived at from what must have been a new conception of the Four Elements as pairs of opposites, for if this idea had existed before, Thales could not have chosen as his substrate one of the four.

It is said that he also thought of it as unlimited in quantity,^e the reason given being that there must be a perpetual supply of material for fresh creation. He believed that there were an unlimited number of universes,^f and that the process as a whole never ceased.^g Aristotle, while pointing out that the concept of infinity must be admitted, and that the source of creation must be infinite,^h nevertheless attacked the concept of a corporeal infinite,ⁱ and refuted the idea that it was necessary in order that creation should not cease.^j It is possible that Anaximander was not clear upon this point, or that he assumed the supply of matter to be inexhaustible, though not necessarily

^a A1 ^b A1, A9, A9a, A11, A14, A16, B1 ^c A9, A11 ^d A1; A9, A16

^e A14, A15, A17, A9a ^f A9, A10, A11, A14, A17 ^g A15, B2, B3

^h A15 ⁱ A16 ^j A15

infinite in extent.¹ At any rate, unlimited quantity was not necessary to his scheme, since what was created returned ultimately to the source, he says this in the sentence^a attributed to him, where it is seen to be an essential part of his scheme, having a moral sanction even in the physical world.

Another logical reason for having as substrate something that is over and above^{b, b1} the Four Elements and not any one of them seems to have been that a difficulty was felt in having a substrate that itself was constantly changing, like Thales' Water. It could be said of the Non-Limited that it was eternal and indestructible,^c and did not change as a whole when giving birth to a Cosmos,^d its quality remained the same. This was of course unsatisfactory and superficial in the light of later thought, but it was a step forward in the search for an unchanging reality behind phenomena.

It is not known whether Thales suggested the process by which other things are derived from Water, perhaps he did not think an explanation necessary. If not, then Anaximander is original in this also. His explanation was that the Opposites 'separated out' from the Non-Limited,^e the doxographers say that the cause of the separating-out was 'the Everlasting Motion'.^f This latter term is not explained, and may not have been Anaximander's, the power of movement shown in the periodic separating-out of the Opposites to form a Cosmos was inherent in his substrate. But the former term, 'separating-out', was probably his, it is a descriptive and metaphorical term, not a definition, so that its exact meaning for Anaximander is not definable. He may have meant that the Opposites, in leaving the mixture which held them all neutralized, became articulated, separated off into pairs of antagonists, or — and this is supported by one of the doxographic accounts of the cosmogony^g — that a piece of the Non-Limited broke away from the Whole whenever a Cosmos was created. It may even mean that the Non-Limited rotated,^{h, h1} this being 'the Everlast-

^a B1, A9 ^b A16 ^c B3, A15 ^d A9, A1 ^e A9, A10, A16

^f A9, A11, A12, A17 ^g A10 ^h A10

^{b1} τὸ παρὰ τὰ στοιχεῖα Aristotle, *Phys.* 204b

^{h1} ἀνακυκλούμενων πάντων αὐτῶν [Plut.] *Strom.* 2

¹ ἄπειρον definitely means unlimited in quantity as well as quality in the doxographers. Simplicius uses ἄοριστον to mean indefiniteness of quality as opposed to ἄπειρον, when speaking of Anaximenes (13A5). He took both Anaximander and Anaximenes to mean that their substrates were unlimited in 'size' (μέγεθος).

ing Motion', and threw off pieces as it revolved, an idea later to become familiar. The latter explanation, though perhaps crediting Anaximander with less boldness and insight than the former, seems more in accordance with the evidence. His cosmogony of course shows a process of articulation; but probably the term 'separating-out' (it is sometimes given as 'separating-off')^a refers only to the original breaking away of a piece from the Non-Limited.

There is no corresponding term for the return of the Opposites to the Non-Limited; it seems therefore from this and from his rather elaborate cosmogony that he was more interested in the process of Becoming than in the reverse process that meant the destruction of a Cosmos. The latter was an essential part of his scheme; but if he cared more about genesis than about the reverse, it may be true that he regarded the Non-Limited as necessarily infinite in quantity, so that Becoming should not cease, and overlooked the fact that such a supposition was logically unnecessary. The return of the Opposites to the Non-Limited was thought of by him not as a means of replenishing the supply, but as a means whereby their mutual strife and encroachments could be readjusted.^b Their differences were again merged in neutrality.

Anaximander's cosmogony was as follows: at the creation of this universe, there broke off from the Non-Limited a piece capable of generating the pair of Opposites Hot-Cold. From this the rest of the articulation followed. There is only one report^c of this initial step, but it is drawn from Theophrastus, and it is this passage that also states that the mixture revolved. The view therefore that 'separating-off' (as it is here called) merely means the breaking off of the necessary piece rests on good authority. This passage also throws light on the nature of the Non-Limited, for it becomes clear that the Opposites Hot-Cold are regarded as the original pair from which the others of which we know are derived. The Non-Limited therefore might be said to be a mixture in which Hot-Cold are held

^a A9, A10^b B1, A9^c A10

^{c1} τὸ ἐκ τοῦ ἀίσιου γόνιμον θερμὸν τε καὶ ψυχρὸν. The use of τὸ shows that this was the piece necessary to the creation of a Cosmos: there could not be, to start with, a piece containing some other pair of Opposites. Guthrie (*Orpheus and Greek Religion*, pp. 223-4) suggests a possible parallel between τὸ γόνιμον and the Orphic Egg, but he is fully aware that 'it was in reaction against the mythologists that they [the early scientists] put forward their own systems'.

together in neutralization; it must therefore be a kind of mean between them, as when hot water is mixed with cold. It is not a mixture of everything, not even a mixture of other opposites independent of Hot-Cold.

The portion separated off then differentiates into Hot and Cold, the Hot embracing the Cold in a ring, as the bark grows round the tree ^{a, a1} This Cold by then consisted of a layer of Air, and inside it was the Earth.^b At first this so-called Earth was all Wet, but by the action of the Hot drawing up the moisture, it had gradually been dried, the Wet which remained in the hollows of the earth is the sea. It is still being evaporated, and some day all will be Dry.^c Thus there came into being four rings: Hot (Fire), Cold (Air), Wet (Water), Dry (Earth), the ring of water being broken.

Meanwhile, the outer ring of Fire had also been disintegrating ^d The result was three inner rings of Fire, going round the Earth like the circumferences or felloes of wheels, with the Earth as their common centre. These rings were that of the sun,^e that of the moon,^f and that of the stars ^g We cannot see the whole of the rings because they are each enclosed in a casing of air. The sun-ring is the farthest away, it has one aperture, through which the sun appears, this aperture being borne round as the wheel turns. The moon-ring comes next, it too having one aperture. The star-wheel comes nearest, having many small apertures. The respective distances of the wheels from us are implied in the statement that the sun-ring is twenty-eight^{b, h1} times the size of the earth, the moon-ring nineteen times,ⁱ that is, 27 + 1 and 18 + 1 express sun plus earth-ring, and moon plus earth-ring, respectively. The actual aperture in the sun-ring, through which we see what we call the sun, is equal in size to the earth ^j These rings lie slant-wise relatively to the plane of the earth,^{k, k1} and their rotatory motion was started in the beginning by the Fire evaporating the Wet surrounding the earth, and so giving rise to winds.¹

^a A10 ^b A10 ^c A27 ^d A10 ^e A21 ^f A22 ^g A11, A18

^h A21 ⁱ A22 ^j A21 ^k A22 ^l A27

^{a1} The doxographer calls this a 'sphere', but if the metaphor of bark growing round a tree is to be given a meaning—and it is more likely to be Anaximander's than σφαῖρα which is a Pythagorean idea—then a ring of Fire rather than a hollow globe must be intended. Presumably a ring of bark as seen in section in a felled tree or log is the source of the simile. Anaximander's Earth was not spherical.

^{h1} Elsewhere the same authority (Aetius) gives this as 27 times

^{k1} (of the moon-ring) κείμενον λοξόν, ὥσπερ ἐκείνου (the sun-ring)

Anaximander expressed this cosmogony by means of metaphors which later were sometimes misconstrued. His concentric rings of air enclosing fire he likened to the hollow felloe^a (circumference) of a wheel, and the aperture through which the sun is seen — the only one in its own ring — he called a breathing-hole, and likened it to the nozzle of a bellows^{b, b1}. The modern equivalent is the inner tube of a pneumatic tyre with its valve. The same applied exactly to the moon-ring.^c The same applied also to the star-ring, except that it had many of the 'pipe-like passages' or breathing-holes.^d This vivid and original conception was however later misinterpreted by some, as we see in the tradition preserved by Achilles the Byzantian.^e Here Anaximander is represented as saying that the sun is wheel-shaped, for as a wheel has a hollow *nave*, and the spokes extend from it to the circumference, so the light of the sun is sent out in rays from a hollow centre. At this point the reporter fails to fit in the metaphor of the bellows, and therefore disingenuously adds it as the opinion of some other thinkers. The source of the confusion was the use of the term 'circle'¹ to mean a ring going round the earth, this was mistaken to mean the sun's round disc.

A difficulty arises over the starry ring. In one authority (Hippolytus)^f the star-ring is described as single, just like that of the sun and that of the moon, a little farther on, the same doxographer speaks of many such rings. In Aëtius is the statement that 'the stars' are carried round each by the ring on which it stands.^g Anaximander is credited with distinguishing between the fixed stars and the planets, and it certainly seems necessary, if his scheme was to cover the obvious phenomena, that he should suppose at least one ring that did not turn for the apparently fixed stars, and another ring or rings that did turn for the planets. The movements of the constellations, too, do not seem to fit the ring-theory very well, especially of those that, like Ursa Major and Minor, revolve round an axis in the heavens, instead of appearing to revolve round the earth.² But

^a A21 ^b A21 ^c A22 ^d A11 ^e A21 ^f A11 §4 ^g A13

^{b1} ἐκπνοή 'breathing-out-hole' is more accurate, it is metaphorical for the streaming-forth of the heat and light. There was no corresponding in-breathing.

¹ κύκλος. The word τροχός (wheel) is more frequent.

² Burnet (EGP⁴ p. 66, p. 69) thinks that the earth also rotated in Anaximander's system. But the reading and meaning of the fragment of Eudemos (A26), on which this view is based, are uncertain.

tradition preserves nothing further on this point, it records only that Anaximander calculated the size and distance of the heavenly bodies ^a Perhaps the difficulty about the star-ring or rings accounts for the fact that no size relative to that of the earth is given for such a ring, as it is for the sun- and moon-rings. He said that the sun-ring was 28 times (27+1), the moon-ring 19 times (18+1) that of earth, modern scholars on this analogy have suggested nine as the number for the star-ring. But this is a guess, perhaps Anaximander could not give one measurement, because the star-ring was not one but many.

One account of the stars says that they were 'pads of air, wheel-shaped, full of fire, breathing out flames at a certain point through mouths' ^b One is at first tempted to see in this an explanation of the planets ^c that they were free to move, whereas the star-ring, for instance the Galaxy, was stationary. But we have the report that each 'star' stood on its own ring and moved with it ^c this surely refers to the planets. It seems then that we have here the same mistaken tradition as in Achilles ^d, ^{d1} a star-wheel is taken to mean a wheel-shaped star, just as the sun-ring was taken to mean the wheel-shaped sun

The explanation of celestial phenomena was completed by a theory of eclipses, ^e and of the phases of the moon ^f These, he thought, were due to the occasional or periodic stopping-up of the breathing-holes in the rings, the air, that is, closed up the hole through which the fire shone

In the centre of the system of rings was the earth It was cylindrical or columnar in shape, with a height of one-third of its width ^g We live on one surface, and there is another underneath. The earth held the central position, and could not leave it, not because anything supported it, but because it was under a necessity to remain in the middle. This 'necessity' is not explained; it may have been imposed by the evolution of earth *inside* all the rings These views are clearly meant as an emendation of Thales' theory that the earth was supported by water. It is wrong, however, to deduce as some modern scholars do that Anaximander conceived of the universe as having no absolute

^a A19

^b A18

^c A18

^d A21

^e A11, A21, A22

^f A11

^g A10, A11, A25

^{d1} See p 60, also p 65 The word translated 'pads of air' in the quotation above is *πλήματα* The words *πλησις*, *πλουσσαι*, are used by the doxographers when describing the work of Anaximenes Perhaps here we have a transference of terms from Anaximenes back to Anaximander

up-and-down, because he placed nothing under the earth to support it. On the contrary, the columnar form he attributed to the earth shows that he saw it as standing *upright* in the Cosmos, and so too does his view that we live on the *upper* surface, there was an under surface, but it was a mere antipodes. The earth cannot fall 'down' because it is not allowed to move away from the centre; but there is a 'down' for it to fall, if it were allowed.

This cosmology was filled out with attempted explanations of all the other meteorological phenomena discussed then and later by almost all scientists. Thunder, lightning and winds were all caused by the air: air was shut up in a thick cloud, and burst out with violence, the breakage of the cloud caused the noise of thunder, and the rift gave the appearance of a flash in contrast with the surrounding blackness of the cloud.^a Winds were caused when the lighter particles of air (mist) were separated off from it, and moved about having collected together;^b rain came from the steam given up from the earth under the influence of the sun.^c Eclipses (as has been said) of the sun and moon were caused by the complete stopping of the breathing-holes; the phases of the moon were due to the same cause operating gradually and regularly.^d This opening and closing of the valves was connected (how, is not stated) with the revolving of the respective rings.^e An explanation of earthquakes is also attributed to him.

Anaximander put forward some remarkable views on biology, here his work seems to join on to that of Thales. He said that all living creatures arose from the moist element as it was evaporated by the sun.^f These primitive creatures, having come into being in the moist element, were covered with prickly wrappings,^g but as they grew older they climbed out on to the drier part, their wrappings broke off, and they survived only a short time.^h Mankind, therefore, was originally like a fish,ⁱ or to put it differently, these fish-like creatures contained within themselves human beings, to which, by bursting asunder, they subsequently gave birth.^j The reason for thinking that man was originally born from creatures of a different species is that whereas other animals soon find food for themselves, man is the

^a A23, A11^b A24, A11^c A11^d A11, A21, A22^e A22^f A11 §6^g A30^h A30ⁱ A11 §6^j A30^g φλοιοῖς ἀκανθωδέσι φλοιός = the inner bark of trees.

only one that requires a long period of suckling; so that if he had been so made originally, he could not have survived.^a Hence in the beginning another creature must have nurtured the human foetus until it was old enough to look after itself.^b

Anaximander's scientific attainments included two practical discoveries. He introduced to Greece the Gnomon,^c a sun-instrument for measuring the time, the seasons and so on, this, Herodotus says, was taken over by the Greeks from the Babylonians, so that perhaps Anaximander made some notable improvement in it. He also produced the first map of the known world, which was afterwards used and revised by Hecataeus.^d

No description of the return of a Cosmos to the Unlimited survives. That it does so return we know from the only remaining sentence^e of his works, where it is said that particular things are bound by the law of necessity to return to that from which they took their origin, there they will make reparation and pay penalty for their injustice to one another, according to the arrangement of time. We know, too, that in our Cosmos this process is going on, for the moist element is being dried up by the hot, and some day all will be dry.^f Creation means differentiation of opposites, which are then in a state of strife with each other, now one, now the other gets the upper hand. When in due time they return to the source, all these differences will be merged in the impartial whole. This seems to imply a moral force governing the universe, at work in non-human and in inanimate as well as in human nature, but there is nowhere else any hint that Anaximander conceived such a force. The Peripatetic School liked to compare Anaximander's Unlimited with Anaxagoras' original mixture of Seeds,^g if they had found in his work anything equivalent to Anaxagoras' Mind, they would have seized upon it. It seems more likely that Anaximander was trying to express the relation of the Opposites, and their final dissolution in the Non-Limited in terms of a more familiar concept, that of human justice, that is to say, that he was using a metaphor, as he was fond of doing, to explain a difficult and, it seems, original idea. his new view of the elements as pairs of Opposites. It is even further from the truth to suppose, on the strength of a word omitted in the Aldine Simplicius but found in the manuscripts, that Anaximander

^a A10^b A30^c A1, A4^d A1, A6^e B1, A9^f A27^g A9, A9a

conceived of a mystic sin committed by the universe in being articulated at all.¹ There is, in fact, no reason to suppose that Anaximander was foisting a moral explanation on to his cosmology, there is no evidence that he was interested in ethics. The only statement attributed to him about the Soul is that it was 'air-like',² and in this his name is coupled with Anaximenes, Anaxagoras and Archelaus.

13 ANAXIMENES

ANAXIMENES of MILETUS is said to have been in his prime about 546 B.C.,³ the date of the fall of Sardis. This is an arbitrary estimate of Apollodorus. We know only that he was third in the succession of leaders of the Milesian school, and that his work must have been done before 494 B.C., when Miletus was destroyed, since he is not heard of as being in exile.

The references in Aristotle are very few and brief: in the *Metaphysics*,⁴ that Air is the substrate, in the *Meteorology*, that the sun goes round, not under the earth, and 'sets' behind the northern heights,⁵ elsewhere in the same book, the cause of earthquakes.⁶

Theophrastus must have given Anaximenes more attention, for the doxographers, Simplicius, Aetius and Hippolytus are full, interesting and mostly in agreement. The Plutarchian *Stromateis* has a paragraph.⁷ Plutarch describes the process of condensation and rarefaction, the breathing-experiment and Aristotle's refutation of the deduction drawn from it,⁸ in this he quotes at least one word⁹ as Anaximenes' own. The Life in Diogenes Laertius is very brief.¹⁰ Suidas quotes no opinions.¹¹

Anaximenes certainly wrote a book, the style of which is said to have been 'simple and unextravagant Ionic'.¹² One whole sentence has survived.¹³

He is said to have been the pupil and associate of Anaximander,¹⁴ and is undoubtedly partly using, partly combating or

^a A29 ^b A1, A2, A7 §9 ^c A4 ^d A14 ^e A21 ^f A6 ^g B1

^h A1 ⁱ A2 ^j A1 ^k B2 ^l A1, A2, A5, A9, A10, A14a

¹ Gomperz, *Greek Thinkers*, Vol I, p. 55. The word ἀλλήλοις was omitted in the Aldine Simplicius.

² χαλαρός, 'slack'

emending his results. He appears to have kept more closely to meteorology than his predecessors, no mathematical speculations or practical inventions are attributed to him.¹ The biological interest is also absent, except in so far as *breathing* is concerned, so too is any ethical doctrine, and his attitude towards religion seems to have been antagonistic. No personality emerges, we seem to have in him the pure scientist, confining himself to one branch of science, and reaching through this and this only a conclusion about the Whole. His concentration did not spoil his work, his cosmology is not inferior to that of his predecessors, except that one or two of his guesses were less fortunate than Anaximander's, but Anaximander also made fantastic guesses. The important thing about these guesses (that is, hypotheses going beyond what the evidence warranted) is not only their actual proximity to the correct explanation since discovered, but also the principle involved: the effort to arrange the observed data in an intelligible scheme, based on a cause-and-effect relationship between them. This principle is at work in the mistakes of these men no less than in their successes, and it is present in the work of Anaximenes no less than in that of Anaximander. Moreover, as a metaphysician he certainly gained by his concentration.

He chose as his substrate Air (Vapour)^a As the doxographer says, there is a distinction between what is unlimited in extent, and what is undefined in quality.^b Anaximenes chose a Non-Limited in quantity but not in quality,^c the distinction between the two sorts of quantity, number and extent, had not yet arisen. He took over Anaximander's idea of a Non-Limited in quantity, and restored to it a definite quality, calling it Air.^d

Air is one of the Four Elements, how then could Anaximenes, after the work of Anaximander, return to one of these? He was enabled to do so by what is really the central point, the One, in his metaphysics, and that is the process or principle of change. He was the first to see the importance of defining this principle, and he offered as his description of it, not a metaphor like 'separating-off', but a direct statement of a law. This was the principle of rarefaction and condensation.^{e, e¹}

^a A4, A5, A6, A7, A8, A9, B2 ^b A5 ^c A6 ^d A5 ^e A5, A6, A7, A8, B1

^{e¹} Rarefaction and condensation μανότης, μάνωσις, ἀραιώσεις, πυκνότης, πυκνώσις, πύλσις. The verbs are ἀραιεῖσθαι, διαχεῖσθαι, πυκνοῦσθαι, πηλοῦσθαι, συνίστασθαι.

¹ Except that the Gnomon and sun-clock elsewhere attributed to Anaximander are by Pliny given to Anaximenes (A14a).

This principle, though he required two words to describe it, is one — difference of density, so that it is better than Anaximander's in that it works both ways. Also, it is a quantitative difference; it was essential to the progress of science that the importance of quantitative differences in determining quality should be realized. The other so-called elements were derived from Air by this process. Air when rarefied became Fire, and when condensed, wind, then cloud, then water, then earth, and lastly stones.^a He recognized, therefore, a connection between density and temperature. Thus the barriers not only between the elements but also between the Opposites were broken down; for they were shown to be the same substance more diffused or more tightly packed.^b It will be noticed that the next step is to speak of particles thus diffused or compressed, but there is no record of his having done so.

By this principle, then, the substances are arranged in a scale according to density, and this gives rise to Hot and Cold,^c the Cold has subdivisions, vaporous, liquid and solid. Between Hot and Cold stands Air, in which they both merge, where the balance is equal, where indeed as one doxographer says, Air-Rarefied (the Hot) or Air-Condensed (the Cold) 'returns to its own nature'.^d It might be asked why, if the only difference between these forms is one of density, Air should be regarded as ultimate, any more than the others. If Fire is rarefied Air, Air may be equally well described as condensed Fire. This is the logical outcome of Anaximenes' law. But he did not see it so. He was dominated by the idea of the Opposites, Hot and Cold, which he had accepted from Anaximander; and he saw his arrangement of the forms of matter not as a scale stretching to infinity in both directions, but as a scale limited in each direction, having ends and therefore capable of being bisected. His Hot is Absolute Hot, and his Cold Absolute Cold. The Hot end is the end beyond which the process of rarefaction cannot go, and the Cold end that beyond which condensation cannot go.

He was also trying to work out a connection between motion and change of form. The Air, he said, is in constant motion; if it were not, the changes it undergoes would not take place.^e It appears that he believed it to have in itself this power of movement,^f that is, the power of rarefying and condensing, he,

^a A5, A7^b A8^c A7 §3^d A8^e A7 §2, A5^f A6

like Anaximander, does not suggest a First Cause of motion. Nor does he suggest why the substrate should sometimes rarefy, sometimes condense. In the particular phenomena of the Cosmos, the cause of motion remained obscure, the movement of the winds was ascribed to 'some unknown impulse to flow' ^{a, a1}. He went some way towards suggesting a connection between rarefaction and mobility: on the Cold side of the scale we have first winds (mobile vapour), then clouds (less mobile vapour), then water, which is less mobile than cloud but more mobile than earth; and so on. On the Hot side of the scale there is Fire, which no doubt he regarded as the most mobile of all. Air might be expected to stand half-way between the Hot and the Cold in respect of mobility, but it seems that winds, the first result of the condensing of Air, are also a quickening-up of it ^b. However, this difficulty resolves itself when we recognize a distinction between mobility, that is internal motion, and movement in a mass, relative to external things. Air is 'most equable' ^{c, c1} in its motion, when winds arise, a portion condenses and is propelled swiftly, the internal mobility of the 'mass' of wind need not be so great as that of the Air, which throughout its whole corpus is constantly in motion.

Swiftness of motion in the mass, relative to external things, was connected by him with temperature, he says of the sun that it is earth, but gets its burning power from the swiftness of its movement, which makes it very hot ^d. Further, he wished to equate rarefaction with increase in temperature, and condensation with decrease in temperature, he illustrated this by taking the proverbial 'blowing hot and cold', and suggesting that when we breathe with the lips contracted, the current of air is cold, whereas when we expel the breath through wide-open mouth, it is warm ^e. Aristotle dismissed this as 'the man's ignorance; for when we breathe out with open mouth, we breathe the heat from our own insides, but when we blow with contracted lips, it is not our own breath but the air before the mouth which we propel, and that is cold' ^f.

This brings us to another reason which supported his choice of Air as substrate, a reason similar to that which caused

^a A19

^b A7 §7

^c A7 §2

^d A6

^e B1

^f B1

^{a1} ῥυμη τινι ἀγνωστοῦ (Galen)

^{c1} ἀμαλώτατος

Thales to choose Water' namely, its importance for the maintenance of life. At this period, Air was identified with Breath, and so with Life or Soul¹ The above illustration, although he drew a wrong conclusion from it, shows that he was interested in breathing, and in the remaining sentence of his book he says that just as our soul, being Air, holds us together, so do Breath and Air encompass the whole Cosmos^a He did not say that the Cosmos breathed, but his analogy seems to show that he thought of Air as not only encompassing the Cosmos, but also running through it and connecting it There was outside the Cosmos a boundless supply of Air for it to draw upon, just as our bodies draw upon the Air outside.

Ultimate Air, the substrate, was invisible, it became visible 'by the Hot and the Cold and the Wet and the Moving'^b The question suggests itself, did he think that it was present in our Cosmos in an invisible form, that is, did he suspect the existence of 'atmospheric air'? This seems unlikely. What is meant is probably that from the outside Air, which is invisible and in constant motion, our Cosmos draws its supply for creation, but that the Air thus taken in changes its form, that is, assumes forms visible, perceptible to us, by rarefaction and condensation This assumption of perceptible forms is what is meant by Becoming In its 'equable' form Air cannot be perceived, but when it rarefies to Hot, or condenses to Cold or still further to Wet, and when a portion thus rarefied or condensed is given separate and distinct motion, then it can be said to have 'come into being' out of the substrate, and to have become visible to us in our world

Having thus thought out his substrate and his process, he went on to apply them consistently throughout the whole range of phenomena The first step was the condensation of a portion of Air,^c this was his substitution for Anaximander's separating-out, but he does not explain how it arises. It follows that the Cold, not the Hot, is the first to appear, that is, the Earth came into being before the heavenly bodies in our Cosmos It is to be noticed that in the cosmogony the condensation of Air to form Earth appears to be direct, and the stages of Vapour and Water are omitted. This first condensation was therefore intense

^a B2^b A7 §2^c A6¹ πνεῦμα ἄνιμι, to breathe ψυχή, Life or Soul

The resultant body was flat,^a like a table-top or a lid,^b and thus was able to 'ride' on the air below it. Its flatness gave it resistance,^{c, c¹} so that it did not 'cut' the supporting air. This air did not give way under the pressure of the earth because there was nowhere for it to go.^d These views are clearly intended as a correction of Anaximander's; the view of Thales is preferred, with Air in the place of Water, and with the addition of the reason why the supporting substance did not itself need support. It was necessary to add this, for Thales had pointed out that things can float in water but not on air.^e The illustration ascribed to Anaximenes was the resistance offered by flat bodies to the wind: they are 'hard to move' for this reason, and the same principle is at work in the buoying up of the earth from underneath by air.^f Aristotle quotes this without comment, but in Anaximenes' Cosmos, with its absolute up-and-down, it does not seem apt. A flat body, presenting a surface to the wind, is easy, not hard to move, unless it is otherwise fixed, and moreover the earth is represented as pressing down upon the air that supports it, not being blown against by it. Elsewhere the heavenly bodies are said to float in air for the same reason as Earth, namely because of their flatness,^g but they, it is clear, cannot be called 'hard to move', for they can even be blown out of their courses by winds.^h They do, it is true, present a surface to a wind blowing laterally, or in other words, they are placed on edge, as it were, in relation to the disc of the earth, and this keeps them afloat 'like leaves'.ⁱ But this is not the same thing as the downward-bearing earth, nor can it be said of the heavenly bodies that their flat surfaces offer resistance that makes them 'hard to move'. So that either Anaximenes' illustration was confused, or there has been a fusion, one concerned with earth, another concerned with the heavenly bodies, and Aristotle has reproduced it. It is hard to believe that Aristotle, usually so quick to find fault, did not see the difficulty, if he did, he did not think it worth comment.

The sun, moon and stars have their origin from the earth.^j Mist rises from the earth, and is in its turn rarefied to Fire, that is to say, after the initial condensation of Ultimate Air, there

^a A6, A7 §4^b A20^c A20^d A20^e 11 A14^f A20^g A7 §4^h A15ⁱ A14, A15^j A6, A7 §5^{c¹} ἀντεπείσιν (Aristotle)

is a reverse process of rarefaction, why or how this comes about is not stated. From this Fire, riding freely in the vaulted space, the heavenly bodies are formed. The sun can therefore be said to be earth; but it gets its heat from the swiftness of its motion.^a This implies that the sun would condense and cool down if it ceased to move, apparently Anaximenes thought that the sun moved faster than the moon, that is, the sun made daily the revolution that the moon made monthly. These bodies are all flat like leaves,^b or, according to another simile, they are like paintings, that is, are in two dimensions only.^{c, c¹}

The moon is said to be 'made of fire',^d some credited him with the discovery that the moon gets its light from the sun, but this does not accord at all with the rest of his cosmology, and must be dismissed. The moon in Anaximenes' system seems to be just like the other heavenly bodies, a piece of earth rarefied to fire, flat, floating about, moving less swiftly than the sun and therefore not so hot, nearer to earth than the stars and therefore appearing to us bigger than they. No explanation of lunar phases is recorded.

He definitely distinguished between stars and planets, he spoke of 'stars fixed like nails in the crystalline vault', and stars which are 'fiery leaves, like pictures'.^{e, e¹} There are also among them certain earthy bodies which are invisible,^f that is, bodies which, like the visible stars, were originally rarefied from earth but have lost their heat and have condensed again to their former nature. These 'are carried along with the stars, in the starry region'.^g It has been suggested that he used

^a A6^b A14, A15^c A14^d A16^e A14^f A7 §5, A14^g A7 §5

^{c¹} 'Αναξίμενης ἤλων δίκην καταπεπηγέναι τὰ ἄστρα τῷ κρυσταλλοειδεῖ. ἔνιοι [?] δὲ πέταλα εἶναι πύρινα ὥσπερ ζωγραφήματα (Aetius). Burnet (EGP⁴, p. 77, n. 4) comparing Plato, *Timaeus* 55c (where ζωγραφῶν is used of the Creator's diagrams) takes ζωγραφήματα to refer to the arrangement of the constellations. But the whole phrase disallows this 'fiery leaves, like paintings'. Anaximenes' leaves ride freely in air, and can even be diverted by meeting condensed air, therefore ζωγραφήματα cannot refer to a fixed arrangement here, unless it be written after the first half of the sentence, which Burnet rejects (see below, note ^{e1}). The only other likeness between the leaves and paintings is their flatness. Anaximenes is at pains to take away as far as possible the thickness of the bodies of our Cosmos, as is shown by his making the earth a flat disc instead of a cylinder.

^{e¹} Burnet (EGP⁴, p. 77, n. 4) rejects the first half because it does not fit his view that Anaximenes like Anaximander made the earth rotate in its own plane. I prefer with Diels to doubt ἔνιοι, and ascribe the whole to Anaximenes.

these to account for eclipses¹ and phases of the moon. In that case 'the starry regions' must refer principally to the region occupied by the sun and moon,² since they are thought by Anaximenes to be nearer to us than the other heavenly bodies. The reason why the stars give no heat is their distance from the earth.³ This last statement is again a correction of Anaximander, who placed the star-region nearest

Thus the sun, moon, planets and dark bodies float like leaves in the heavens. The cause of their motion is not stated, though it was affected by their meeting with condensed air.⁴ Their normal courses are not under the earth, as Anaximander said, but round it, 'as a cap turns on the head',⁵ it is a lateral motion like that of a millstone.⁶ When they disappear, they go 'behind the higher parts of the earth'.⁷ The sun is hidden at night because the earth is 'high towards the north'.⁸ The meaning of this is uncertain: either there are highlands in the north behind which the sun sets at night, or (and this seems more likely) Anaximenes was again emending Anaximander: whereas Anaximander had given his earth's surface the horizontal position and made the rings lie slantwise with regard to it so as to pass under the earth, Anaximenes preferred to think of the heavenly bodies moving in the horizontal plane, and the earth lying in another plane with regard to it, that is, tilted up at the north, so that the sun sets behind the uptilted curve when he disappears in the west, and reappears on the other side. It is also suggested that the distance of the sun from us becomes greater as he gets nearer the setting-point,⁹ this is perhaps meant to account for the decrease in his heating power at evening and morning. If this is what is meant, then the disc of the earth does not float 'flat' on the supporting air, as if on water, but is buoyed up at the northern side. Anaximander conceived of the Cosmos as having two corresponding halves, one above the earth-cylinder, one below, but Anaximenes seems to have preferred a hemisphere. In one place it is stated that he regarded the heavens as the

^a A7 §6^b A15^c A7 §6, A14^d A12^e A7 §6^f A14^g A7 §6¹ EGP⁴, p. 78

² ἀστέρες, ἀστρα are sometimes used of the heavenly bodies in general. For instance, Aetius (A15) says that 'the stars' (τὰ ἀστρα) are diverted so as to turn in their courses by meeting with condensed and resistant air, this is thought to refer to the solstices, and not to any diversion of the stars (Burnet, EGP⁴, p. 76, n. 3)

outermost periphery of the earth,^a this would mean that the 'crystalline vault' rested on the edge of the disc, something like a meat-cover on a dish, but this is impossible if the sun goes behind the earth's tilt at night, for he has to pass between the earth's periphery and the crystalline vault. That this last expression is literally meant must be accepted, unless we reject the statement that there were stars 'fixed like nails' in it, but it is difficult to see how so striking a simile came to be attached to Anaximenes and to no one else if he did not say it. He seems to have thought of the fixed stars as the furthest away, that is, actually stuck in the dome of the heavens. We are not told of what this dome was made, nor how it came to be.

He referred all other climatic phenomena to change of density. Winds and clouds are easily accounted for: winds are the first result of a condensation of air, which in this process is somehow propelled and given motion.^b The origin of the accelerated motion is obscure, Galen marks this obscurity in recording the tradition: 'They are borne along violently and swiftly by some unknown impulse, as birds fly.'^c The clouds are the next stage in the condensation,^d and the next stage again is the 'squeezing out'^e of rain. Hail is produced when the drops in their fall from the clouds are frozen.^f Snow is produced when there is an admixture of air with the water that freezes.^g

Lightning, earthquakes and the rainbow require rather more complicated explanation, but all is done by means of air and density. His theory of earthquakes is given by Aristotle: the earth is cracked by being drenched and also by being dried, and these disintegrations cause shocks, water and heat are the causes, hence earthquakes occur usually in seasons of heavy rain, or seasons of drought.^h Lightning is due to the cleaving of the clouds by the force of the winds, the effect is the same as that which we observe when the sea flashes as it is cloven by the oar-blade.ⁱ The rainbow occurs when the sun's rays fall on air condensed to a thick black cloud, so that they cannot penetrate, and collect there, the part in front of the sun is red in appearance, being burnt by the sun's rays, while the rest is dark, being more under the dominance of moisture. A rainbow is sometimes made by the moon, but less often,

^a A13^b A7 §7^g A17^c A19^d A7 §7^h A21, A7 §8^e A7 §7, A17ⁱ A17, A7 §8^f A17; A7 §7

because it is not constantly full moon, and because the moon's light is weaker than the sun's ^a

Anaximenes believed our world to be perishable, there was always a Cosmos in existence, but not always the same one, it changed in the course of certain cycles of time.^b

The gods, like everything else, were derived from Air,^c or, as Cicero puts it, Air itself is God ^d Particular gods are to be derived from Air, the air is not made by divinity, but the reverse ^e These statements, according to Aetius,^f mean much the same as Thales' view that all things are full of gods: they refer to the powers inherent in elements and bodies, as for instance powers of motion But Air, being Breath, is also Life and therefore Soul ^g

14 PYTHAGORAS

PYTHAGORAS OF SAMOS was in his prime about 530 B C

There are references to Pythagoras in Xenophanes,^h Heraclitus,ⁱ Empedocles,^j Ion of Chios ^k Herodotus discusses the alleged connection of Salmoxis with Pythagoras.^l Plato, who mentions him only once by name, speaks of the strong personal attachment of the disciples to the master, from whom the Pythagorean way of life originated.^m Isocrates refers to Pythagoras' debt to Egypt ⁿ Aristotle wrote a book, now lost, on the Pythagoreans, in which episodes from the Pythagoras-legend were related ^o In Aristotle's extant works there are only two references to Pythagoras himself,^p elsewhere he speaks of the Pythagoreans Lives by Porphyry, Iamblichus and Diogenes Laertius are preserved, these are compiled from various sources, the earliest of which are Aristoxenus^q of Tarentum, a pupil of Aristotle and author of a book on Pythagoras and Pythagoreanism, Dicaearchus of Messene, also a pupil of Aristotle and a close friend of Theophrastus, and Timaeus the historian of Sicily

That Pythagoras himself left no writings was widely believed in antiquity ^r Further, it was believed that one of the

^a A18, A7 §8 ^b A11 ^c A7 §1 ^d A10 ^e A10 (Augustine)
^f A10, cp 11A2j ^g A22, A23, B2 ^h 21B7 ⁱ 22B40, 81, 129
^j 31B129 ^k 36B2, 4 ^l 2 ^m 10 ⁿ 4 ^o 7 ^p 5, 7
^q 9, 3, 8, 11 ^r 17, 18

rules imposed on his disciples was that of secrecy,^a the betrayal of any of his doctrines being punished by excommunication. According to some, this secrecy was observed with marvellous strictness, and no account of Pythagorean doctrine was available till the time of Plato, when Philolaus the Pythagorean, owing to pressure of poverty, wrote an account in three books, which were bought from him at Plato's instigation by Dion of Syracuse.^b Others believed that the knowledge of their geometrical theories began to leak out in Pythagoras' lifetime through betrayal by members, or other causes; Hippasus was said to have been excommunicated for such a betrayal,^c and also to have written a book on their ritual with the express object of bringing discredit on Pythagoras.^d

We are also told that Pythagoras was very difficult of access, and taught his most advanced doctrines to a select group only (the Students),^e while there was an outer circle (the Auditors)^f who were allowed to hear only the rough outlines or heads of the teachings, without exact explanations.^g As an example of his exclusiveness, we hear that he refused to admit Cylon, a rich and powerful noble, to the School, on the grounds of his bad character, and that Cylon therefore became a bitter enemy of the Order and the cause of its overthrow in Croton.^h The disciples were taught by word of mouth, and always appealed to the spoken word of the master; yet even so almost nothing is quoted as the actual words of Pythagoras.

The strong tradition that he wrote nothing was sometimes challenged by the appearance of books alleged to be by Pythagoras. These could generally be assigned to early members of the School. Hippasus the apostate, Lysis the fugitive to Thebes, and one Aston of Croton are names mentioned.ⁱ Those who believed in the authorship of Pythagoras quoted a sentence from one of the treatises. 'By the air I breathe, by the water I drink, I shall never sustain blame for the following doctrine,'^j and alleged that Heracleitus was stimulated by this to 'scream' as follows. 'Pythagoras son of Mnesarchus practised inquiry most of all men. And picking out from these treatises he claimed as his own and as wisdom what was a mere

^a 17, 8a §19, 4^b 17, cp ch 44 (Philolaus) A1^c ch 18 (Hippasus) 4^d 19 §7^e ch 18 (Hippasus) 2^f 16^g 19 §7^h 19 §6ⁱ οἱ μαθηματικοί^j οἱ ἀκουστικοί

accumulation of learning, an art of deceit.^{a, a1} The sentence alleged to be Pythagoras' own is obviously a formula used by authors who wished, when writing a book which laid claim to knowledge, to repudiate responsibility and so avert criticism and Nemesis. The fragment alleged to be Heraclitean looks suspicious, and in any case means no more than that Pythagoras was eclectic he used certain writings from which he made a wisdom which he claimed as his own. The two alleged quotations look as though they are meant to illustrate the hostility of Heraclitus rather than the authorship of Pythagoras, but Diogenes Laertius, who quotes them, takes the Heraclitean sentence to mean that Pythagoras himself wrote treatises. Such a late and confused report cannot shake the tradition that Pythagoras left no writings.

Another tradition was that Pythagoras wrote some works which he attributed to Orpheus.^b This appears merely to reflect an opinion that some of the Orphic writings were by Pythagoras, it may also be meant as a refutation of the charge of plagiarism.

The rule of secrecy has been thought to be a later invention, designed to explain why there is no record of Pythagorean philosophy before Philolaus. Similarly, the distinction of grades within the Order has been regarded as 'designed to explain how there came to be two widely different sets of people, each calling themselves the disciples of Pythagoras, in the fifth and fourth centuries B.C'.^c The later Students (*Mathematikoi*) did not even recognize the right of the Auditors (*Akousmatikoi*) to be called Pythagoreans.^d Some therefore maintained that the Auditors were those who 'listened' on the fringe of the circle, others that they did not derive from Pythagoras at all, but from Hippasus.^e Again, it has been thought that the 'silence' was kept only with regard to the religious tenets, and that the scientific doctrines were not

^a 19 §6, 22B129

^b Ch 36 (Ion) B2

^c Burnet, EGP ed 1, p 94

^d Ch 18 (Hippasus) 2

^e Ch 18 (Hippasus) 2

^{a1} Πυθαγόρας Μνησάρχου Ιστορίην ἡσκησεν ἀνθρώπων μάλιστα πάντων καὶ ἐλξεάμενος ταύτας τὰς συγγραφὰς ἐποίησατο ἑαυτοῦ σοφίην, πολυμαθείην, κακοτεχνίην. This fragment has passed through many vicissitudes in the hands of scholars. Diels condemned it as a forgery, Zeller deleted ταύτας τὰς συγγραφὰς, Kranz has come round to the view that it is genuine (see Diels, *Vors* p 181, note), Burnet also accepted it in his 4th Edn (EGP, p 134). The probability is that it is a garbled quotation, used to illustrate the point of the story and imperfectly remembered out of a general recollection of Heraclitus' known hostility and his admission of Pythagoras' learning (22B40).

secret But Hippasus was said to have been expelled for betraying a mathematical doctrine as well as the religious tenets. The silence therefore, if it was a rule of secrecy, applied to both sides of the doctrine

If the rule of secrecy existed, it was not kept, for Heraclitus apparently knew of Pythagoras as a scientist, not a religious teacher. he said that Pythagoras had abundance of learning which did not teach him intelligence, and classed him with Xenophanes and Hecataeus ^a Herodotus also spoke of him as 'not the weakest of the sophists', ^b at a time when 'sophist' referred to rational speculation Empedocles is said to have written verses in praise of Pythagoras as a man of very great knowledge ^c Heraclitus is thought to have derived his information from Hippasus. ^d As for the religious tenets, they were said to have been the first to become known, ^e and Xenophanes, who was contemporary with Pythagoras, knew that he taught transmigration. ^f Since, therefore, Pythagoras became at once famous as both religious and scientific teacher, we have either to disbelieve in the 'silence' as a rule of secrecy, ¹ or to regard the promulgation of the doctrines outside the School as due to betrayal The latter view accords best with what we know, and is not inherently unlikely It is even probable that the mathematical doctrines were regarded as more secret than the religious, ² for the former were original, whereas the doctrine of transmigration was not ³ The hostility of Heraclitus also can best be accounted for by the supposition that he obtained his information from a hostile source The two later branches of Pythagoreanism cannot be traced to the two grades within the school, the Auditors were not said to have been debarred from mathematical instruction, but merely to have been taught its outlines, ^b and doubtless all members had to observe the rules of the Order. If later there developed two groups, one which continued the scientific research and the other which dropped it, this was due to natural inclination and ability, not to any distinction imposed by Pythagoras himself

We have, then, the founder of a School, partly scientific, partly religious, but of his own beliefs and teachings, from

^a 22B40 ^b 2, cp ch 79 ^c 31B129 ^d Ch 18 (Hippasus) 1a ^e 8a §19
^f 21B7 ^g 1 ^h Ch 18 (Hippasus) 2

¹ Burnet finally accepted the view that the 'silence' was disciplinary only, EGP⁴,

p 95, n 1

² The actual practices, however, may well have been on a different footing

which his followers must have drawn their inspiration, we know hardly anything. Almost all is conjecture, based on the later development of the School, which does not come to light until over a century later, but which is dealt with very fully and in many places by Aristotle, and on elements in the doctrines of subsequent philosophers which can be traced to no other source

The accounts given of his life can be summarized as follows: he was a Samian, the son of Mnesarchus^a (though later a tradition arose that he was non-Greek by birth),^b and left Samos because he was at variance with the dictatorship of Polycrates. He is said to have visited Egypt and Babylon, where he learnt his mathematical and mystical theories respectively,^c this story sometimes took the form that he was captured by Cambyses while in Egypt and taken to Babylon. These travels probably represent elements in his teaching. He was a friend of Pherecydes, and buried him when he died in Delos.^d He settled in Croton in South Italy, and founded a school there, partly scientific, partly religious. When some aristocratic exiles from Sybaris took refuge in Croton, Pythagoras advised the people of Croton to protect them and accept war with Sybaris. Croton was victorious, and henceforth Pythagoras and his party became the governing class there.

After some years there arose a movement against this oligarchy, under the leadership of Cylon, a rich and powerful noble whom Pythagoras had offended. Before this movement came to a head, Pythagoras retired to Metapontium, where he died. His disciples who remained in Croton were eventually the victims of a plot of Cylon and his party: they were surprised in council at the house of Milo the athlete, and burnt alive, all except two, Archippus and Lysis the Tarentines, the former of whom retired to his native city Tarentum, the latter to Greece, first to Achaea, then to Thebes, where he became the tutor of Epameinondas. The disciples who were not at Croton, and so escaped the massacre, gathered together at Rhegium, and carried on the pursuits of their Order, but did not again acquire political power.^e After the death of Pythagoras, the people of Metapontium consecrated his house as a temple of Demeter, and called the street Musaeon.^f

^a 2, 8 ^b 8 ^c 4, 8, 9, ch. 58 (Pyth. Sch.) 3
^d Ch. 7 (Pherecydes) A1, see p. 17 ^e 16 ^f 13

Of this account, several points are doubtful: his travels, the date and fact of his retirement to Metapontium; the date of the massacre at Croton.¹ As time went by, legends of a miraculous nature began to surround his name, some of these were related in Aristotle's book on the Pythagoreans. They are of the kind usually attaching themselves to sages and religious teachers. Pythagoras when crossing a river heard a supernatural voice bidding him 'Hail', he was once seen in two places at the same time, at Olympia he allowed the spectators to see that he had a golden thigh, showing that he was Midas reincarnated. He could charm animals: a bear, an eagle, a poisonous snake which he killed by biting it. He posed as being of more than mortal nature, and 'though at first he confined his labours to mathematics and numbers, later he did not abstain from the miracle-working of Pherecydes'.² Orphic doctrine was apt to have this effect on the mind even of scientists: we shall see it appearing again in the character and work of Empedocles.

His chief religious doctrine seems to have been that of the transmigration of souls. Herodotus, describing this doctrine, says mistakenly that it is Egyptian,^{b, b¹} and that certain Greeks whom he could name, but will not, have appropriated it, thus he does not ascribe it to Pythagoras. Elsewhere^c he quotes the tradition that Salmoxis, who taught the immortality of the soul to the Thracians, was a one-time slave of Pythagoras, though he himself believes Salmoxis to be much earlier than Pythagoras, this, however, does not prove that Herodotus believed Pythagoras to have taught transmigration, for Salmoxis is said by him to have taught, not transmigration but translation to a blessed life for himself and his disciples. Heracleides Ponticus^d gave in full the tradition that Pythagoras believed himself to have inhabited the bodies of other earlier men: Aethalides the son of Hermes, Euphorbus the Trojan, Hermotimus the prophet of Clazomenae, Pyrrhos a Delian fisherman, and then Pythagoras. From the way in which this story is told, it might seem rather that Pythagoras believed that his was a special case than that all men go through these migrations, for Aethalides the beginner of the

^a 7 ^b 1 ^c 2 ^d 3

^{b¹} In Egyptian eschatology life on this earth is a short period of preparation for a complicated life in another world, there is no return.

¹ This cannot have taken place during Pythagoras' lifetime if Lysis, the tutor of Epameinondas, escaped from it, see below, p. 233, note¹.

line received the gift of 'keeping his remembrance of events, both in life and in death' as a privilege from his divine father, he had been offered his choice of any gift except immortality, and this remembrance was what he chose, the transmigration seems to have been a special device to make this possible. But the belief that Pythagoras extended transmigration to others is supported by the verses in Xenophanes^a said to refer to Pythagoras; here the subject is said to have stopped someone from beating a dog, because he recognized the voice of a friend in its howls, and though Pythagoras' name is not mentioned in the verses, it is unlikely that tradition could be mistaken in saying that they refer to him. In any case, the ascription to Pythagoras shows that he was regarded as the exponent of this idea. The followers of Pythagoras believed that transmigration was common to all, for they tried to work out the exact numerical cycle for man, they did, however, base their calculations on what Pythagoras had said of his own transmigrations when they gave the cycle as the cube of 6 (216 years)^b Perhaps the special distinction of Pythagoras' soul's career was that it had been so long on the human plane, and that it possessed memory of previous planes at every stage in its career, Euphorbus remembering that he had been Aethalides and received the gift, Hermotimus remembering his life as Euphorbus, and so on, until Pythagoras who remembered all, so that he recognized the shield of Menelaus (who had wounded Euphorbus) hung up in the temple of Apollo of the Branchidae.

Together with this goes a way of life, which in his disciples turns out to be an asceticism based on, not a rational anti-hedonism, but a system of taboos. The only taboos ascribed directly to Pythagoras are connected with sacrifice and food.^c The sacrifice of living creatures was forbidden except for blood-purification, according to some, but opinions differed. Others said that he allowed the sacrifice of cocks, kids and sucking-pigs, but not lambs, and he is reported to have himself offered the sacrifice of a bull^d when he discovered his famous theorem. The same divergence is found concerning his food taboos: some say he forbade the eating of animal flesh altogether, others (Aristoxenus) that he allowed it, excepting only the ploughing-ox and the ram, Aristotle himself said that

^a Ch 21 (Xenoph) B7^b 8^c 9^d Ch 58 (Pyth Sch) B19

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the Pythagoreans abstained from certain parts only, such as the womb and the heart. Those who believed that he completely prohibited a meat diet sometimes added that he forbade association with cooks and hunters as being blood-polluted, but Aristoxenus in his opposition went to the other extreme and declared that Pythagoras himself was accustomed to eat 'very small pigs and tender kids'. It is clear that there was keen controversy in later times as to the orthodox Pythagorean teaching, all that can be safely conjectured is that there was a prohibition of some kind concerning the killing of animals either for sacrifice or for food, and that this was closely connected, as always, with the transmigration-theory. Some said that he taught that all living creatures were akin.^a

Again, Pythagoras was said to have forbidden the eating of beans; but this too was hotly contested by Aristoxenus, who said that Pythagoras not only allowed beans, but honoured them above all forms of pulse as being purgative and laxative.^b It is clear that Aristoxenus is combating something non-rational which he does not care to ascribe to Pythagoras, and substituting the opposite rational view, but from all we know of Pythagoreanism, we can certainly decide in favour of the taboo, Empedocles also has it in his *Katharmoi*.^{c, c¹} Many other such taboos are found at work in the later school, one of which, namely abstention from the wearing of woollen clothing at religious ceremonies, is said by Herodotus to have been borrowed from Egypt.^d

The religious part of Pythagoras' teaching was no doubt only one of the most conspicuous movements in a great religious revival in Greece during the sixth century, ritual from Babylon, Egypt, Asia Minor, Thrace, as well as more primitive and savage beliefs, entered into it, as well as the older chthonian religion of Greece which had never died out, and which, at a time of danger to Greece from the invader, took on new life and with many foreign accretions canalized itself in the different Mysteries, Orphic, Dionysian, Eleusinian. The orthodox state religions, the worship of the Olympian deities, were interested in the present, the non-Olympian rather in the past (a Golden Age) and the future (an after-life with

^a 8a ^b 9 ^c Ch. 31 (Emped.) B141 ^d 1

^{c¹} The bean-taboo was supposed to have a symbolic and sexual meaning. See under 31B141

rewards and punishments). The chief 'mystic' deities were Demeter, Persephone, Pluto; Dionysus with Orpheus as his prophet; the Erinyes; and Hermes who belonged to both realms. The worship of these deities was gaining ground at this time, and had already secured an important place side by side with Olympian theology in the religion of States. Theologians such as Pherecydes had worked out cosmogonies and eschatologies to correspond. That this movement was as strong in the west — Sicily and South Italy — as at Athens or in Asia Minor is clear from Pindar.

Where Pythagoras stands in all this is impossible to say; he is a scientist who does not apply the usual scientific rationalism to ethics, and whose interest in transmigration and taboos makes him a part of the religious movement. His house when he died was said to have been dedicated to Demeter; and his soul, he claimed, had originally been in the body of a son of Hermes.^a Aristoxenus said that he took the majority of his ethical doctrines from the Pythian priestess Themistocleia;^a Aristotle that the people of Croton called him Apollo Hyperboreios.^b These statements, true or false, at least go to prove what common sense suggests, namely that Pythagoras in founding his new way of life was eclectic, and chose the best out of all the many ideas that came before him. His system was meant fully to occupy the rational faculty, but not less to satisfy the non-rational faculties of the soul in a way that ordinary philosophical and logical ethics could not do.

Of the vast mass of work done by the later Pythagoreans — the mathematical theorems, the work on the mechanics of sound, the application of geometrical principles to the arrangement of the Cosmos and astronomy — it is impossible to say how much was Pythagoras' work or what exactly originated under his leadership. We find his disciples busy with all these things, and that they have a dualistic cosmology in connection with which a table of ten pairs of opposites had been drawn up. They must have taken their inspiration from Pythagoras, but what he said and did was uncertain even in antiquity. It is, however, hard to believe that the leading principles which guided them were not his.

^a 3 ^b 7

¹ There was another reason for this. Hermes was identified with the Egyptian Thoth, who was credited with the invention of Number as well as writing (58B2).

First, the great concept of Number as the First Principle must surely go back to the Master.^a Benn^b has advanced against this the argument that if Pythagoras had suggested such a unifying force, Heraclitus would not have passed it over. However, if Pythagoras wrote nothing, Heraclitus doubtless received an incomplete report of his teaching; it is possible that he did not grasp the significance of the idea in the form that it reached him. The concept of Numbers and their relationships or 'harmonies'^c as the elements of all things seems far more like the idea of a single great mind than the cumulative result of the researches of many disciples in different parts of Greece. This theory must have stimulated the wide-ranging research of the later school.

The theory of opposites¹ in its dualistic form also probably goes back to him, apart from initial probability, Benn^d has suggested that it was this failure to understand the oneness of the opposites that made Heraclitus so hostile to him. Further, Burnet^e believes that the scheme attacked by Parmenides in his *Way of Opinion* can best be accounted for as the work of Pythagoras, and this scheme is dualistic. However this^f may be, it seems likely that so fundamental a principle was the work of one mind and not of a group, and that it was itself directly derived from the study of the properties of Number.^g

The theorem that the square on the hypotenuse of a right-angled triangle is equal to the sum of the squares on the other two sides is attributed to Pythagoras,^h also the construction of the five regular solids, and the discovery of the irrational or incommensurable.ⁱ Some said that he was the first to identify the morning and evening star.^j One of his biographies quotes the tradition that he could *hear* the harmony of the spheres as they moved, that is, the harmony as a whole, which we ordinary mortals cannot hear.^k He is also said to have coined the word 'philosophy'.^l

It is stated that Pythagoras' studies of Mathematics had a great influence on the way of life which he indicated as the

^a 58B15 ^b *Greek Philosophers*, p. 13 ^c 58B15 ^d *Greek Philosophers*, pp. 13, 14

^e EGP⁴, p. 184 sqq ^f 58B2, 15 ^g 58B19

^h 6a, ch. 18 (Hippasus) 4, ch. 44 (Philolaus) A15 ⁱ Ch. 28 (Parmenides) A1

^j 31B129 ^k 58B15

^l The use of the term φιλοσοφία to designate what we call Mathematics is thought to go back to the Pythagoreans. Heath, *Greek Mathematics*, p. 11

¹ For a list of the opposites see below, p. 248 (58B5)

best. This would mean that the advanced study of Number has a bearing on conduct, it both reveals and explains the essence of Virtue (since Number is the essence of everything), and it leads men to contemplation and the higher life. About Pythagoras himself we are told only that 'he transferred his geometrical philosophy to the devising of a liberal education',^a and this itself may be merely conjecture. But the idea seized firm hold of the scientific division of the later school, who even assigned the virtues to different integers,^b and we see in Plato how the study of mathematics was regarded as a moral as well as an intellectual training, so that this again was no doubt one of the great and fruitful ideas bequeathed by the Master himself.

Pythagoras addressed himself to women as well as to men, and women were from the first admitted to the School.^c One or two of these became renowned; Iamblichus'^d list contains the names of seventeen women, taken from all over Greece, as compared with two hundred and eighteen men. There was a theoretical distinction between male and female *per se* in the Table of Opposites,^e Female stands on the left side along with Darkness, Evil, the Unlimited and the rest. Yet there was no rule of celibacy, as in the system of Empedocles; and Pythagoras himself is said to have married.^f

15-20. OLDER PYTHAGOREANS

15. CERCOPS

To this member of the Pythagorean School were attributed several of the poems sometimes assigned to Orpheus, whom Aristotle believed to have written nothing. The titles included a *Descent into Hades* and a *Holy Discourses* in twenty-four cantos.

^a 6a

^b 58B4

^c 8a §19

^d 58A (Pyth. Sch.)

^e 58B5

^f Ch. 17 (Brontunus) 1

16. PETRON

PETRON of HIMERA wrote a small pamphlet in which geometrical ideas were applied to the universe. There were, he thought, one hundred and eighty-three worlds arranged in the form of a triangle, sixty along each side and one at each corner. These were all in contact, and moved round steadily 'as in a choric dance' ¹ This appears to have been his own original idea, and it looks as if he were applying some theory of points in a line to the whole arrangement of worlds; but by Plutarch's time it was not known if the book survived, and Petron's explanation was lost

17. BRO(N)TINUS

BROTINUS or BRONTINUS of METAPONTIUM (or Croton) was connected with Pythagoras by some marriage tie. Some said that Brontinus had a daughter Theanô who married Pythagoras, others that Theano was Brontinus' wife and a pupil of Pythagoras, others again that Brontinus' wife was called Deinônô, a highly-gifted woman and a member of the School. ^a

Brontinus was said to have written several works, the names of which, such as *Physics*, *Mind and Intellect*, and a work in the Orphic corpus called *The Robe*, do not give much clue to their contents ^b

Alcmaeon the physiologist addressed his book to Brontinus and two others ^c

18. HIPPASUS

HIPPASUS of METAPONTIUM (or Croton, or Sybaris) was said to have been expelled from the Pythagorean School for betraying the secrets, both religious and mathematical; after his expulsion a tombstone was erected to him as if he were dead. ^d A legend arose that his impiety was punished by death at sea

^a 1 ^b 4, 5 ^c 2; 24B1 ^d 4

¹ ἀτρεμία περιπόντας [τοὺς κόσμους] ὥσπερ ἐν χορείᾳ Cp 44A16 (Philolaus), p 225 below, 64A17 (Diogenes of Apollonia), p 281 below, and Plato, *Epinomis* 982e (of the stars) πορεύαν δὲ καὶ χορεύαν πάντων χορῶν καλλίστην καὶ μεγαλοπρεπεστάτην χορεύοντα

Some said that he wrote nothing,^a others that he wrote a book called *The Mystical Doctrine*, with the purpose of bringing discredit on Pythagoras,^b others that he published in writing certain mathematical discoveries. Later Pythagoreans asserted that permission was given to an impoverished member of the School to make money out of publishing the geometrical knowledge;^c but this appears to refer to Philolaus. Some attributed to Hippasus the founding of the branch of the School called *Akousmatikoi*, who were thought to be the successors of the Pythagorean outer ring of pupils, those not initiated into the advanced doctrines.^d

The question of Hippasus' apostasy is closely bound up with the tradition that there existed in the early School a rule of secrecy concerning both the mathematical and the religious doctrines, this has already been discussed in connection with Pythagoras.^e Similar betrayals by other disciples are implied;^f but the name of Hippasus stood out, since he gained a reputation outside the School for mathematical knowledge, claiming as his own several discoveries which the Pythagoreans alleged to be the work of the Master.^g There was also a tradition that Hippasus' insubordination was political: that he headed a democratic movement against the Pythagorean rule, and thus originated a schism which was taken advantage of by Cylon and others.^h

It is possible that Hippasus gathered round him some *Akousmatikoi* or disciples of his own. He is alleged to have taught them that Number is the 'First Pattern of World-Creation', and the 'discerning Instrument of God the Creator',ⁱ but these may be later Pythagorean phrases ascribed to him. One of the discoveries said to have been betrayed is 'the construction of the sphere from the twelve pentagons', and 'the construction of the dodecahedron, one of the five so-called solid figures, in the sphere',^j that is, the knowledge how to construct from pentagons a dodecahedron, and the inscribability of the latter in a sphere, with the finding of its centre.¹ It has been thought that Hippasus may have been the discoverer of the construction of the pentagon and dodecahedron, and that Pythagorean jealousy on behalf of the Master

^a 1 ^b 3 ^c 4 ^d 2 ^e pp 74-799 ^f 4 ^g 4 ^h 5

ⁱ 11 ^j 4

¹ See Heath, *Greek Mathematics*, pp 65, 158-162

accounts for the condemnation of Hippasus as its appropriator and betrayer,¹ but this is only conjecture 'The construction of the cosmic figures'^a (that is, the cube, pyramid, octahedron, icosahedron and dodecahedron) is elsewhere attributed to Pythagoras himself,^{b, b1} and there would have been no reason for Pythagorean 'jealousy' of Hippasus for merely extending the knowledge of geometry unless there had been also insubordination to the Master on his part.

The other revelation which was said to have led to his excommunication was the discovery of the irrational or incommensurable.^c This too was ordinarily attributed to Pythagoras himself,^d it may well have been thought to be of fundamental importance, and its betrayal a sin against the sect, on its first discovery. The discovery of the pentagon, which gave the key to the construction of the fifth 'cosmic solid', the solid that represented in Pythagorean cosmogony the universe itself, also may well have been thought worth keeping secret at first; the 'triple interwoven triangle, the pentagon' (that is, the star pentagon) was used by the Pythagoreans as a symbol of recognition between the members, and was called by them Health ^{e, e1}. This shows its originally sacred character, and is added evidence of the existence of a rule of secrecy that covered mathematics as well as religious observances.

To Hippasus is also ascribed research into the mechanics of sound, he is credited with several experiments on this subject. He took discs of equal diameters and differing thickness, and established a relation between the thickness of the discs and the notes they gave out when struck.^f He also took vessels containing different proportions of liquid, and again established a relationship between the volume unoccupied by liquid and the note given out by the vessel when struck.^g That is, he discovered, or perhaps developed, the idea of the dependence of musical intervals on numerical ratios. He is

^a Ch 14 (Pyth) 6a

^b 44A15

^c 4

^d Ch 14 (Pyth) 6a

^e 44A11

^f 12

^g 13

^{b1} Heath, *Greek Mathematics*, p. 159 'Pythagoras, seeing that there are 5 solid figures, which are also called the mathematical figures, says that the earth arose from the cube, fire from the pyramid, air from the octahedron, water from the icosahedron, and the sphere of the universe from the dodecahedron' This comes from Aetius, who is drawing on Theophrastus, who may be getting it out of the *Timaeus* and be concluding too hastily that 'here too Plato Pythagorizes', cp *Timaeus* 53c-55c

^{e1} *ib.*, p. 161

¹ *ib.*, p. 160

said to have studied the three 'means', arithmetic, geometric and 'subcontrary',^a ^{a1} known in Pythagoras' time, and to have collaborated with Archytas in changing the name of the last to 'harmonic' ^b

The name of Hippasus is coupled with that of Heraclitus as a Monist who believed that Fire was the substrate,^c that is, Heraclitus is said to have followed Hippasus in this. Hippasus' views are not separately given, and no doubt belong to the cosmology of the Pythagorean School.

19. CALLIPHON and DEMOCEDDES

CALLIPHON was said to have been originally a Cnidian 'priest of Asclepius',^d he appears to have migrated to Croton and to have become a member of Pythagoras' School. Pythagoras is said to have taken over from him into his own philosophy certain alien ideas, the story is told that after Calliphon's death Pythagoras declared that Calliphon's soul was his constant companion, and had enjoined on him the following rules: not to go over a place where an ass has crouched, to abstain from thirst-provoking drinks, and to refrain from all blasphemy. These ideas are said by Josephus on the authority of Hermippus to have been taken over from the Thracians and the Jews ^e

DEMOCEDDES was the son of Calliphon, and the most distinguished medical practitioner of his time. He was the leader of the Crotonian school of medicine at a time when this school was foremost in Greece ^f. He left Croton owing to a quarrel with his father, and went first to Aegina, where in one year he easily surpassed the other physicians there, although he lacked all proper instruments and equipment. In the second year the Aeginetans employed him as State Physician; but the Athenians offered him a higher fee and obtained his services. Polycrates of Samos finally obtained him by offering a yet higher fee. Eventually he found himself called upon to cure Darius of a serious illness, and being successful was rewarded with great wealth;^g it is said also that he cured

^a 15 ^b 15 ^c 7, 8, 9, 22A5 ^d 2 ^e 2 ^f 1, 2c ^g 1
^{a1} υπεραντία See Heath, *Greek Mathematics*, pp. 85, 86

Atossa the wife of Dareius of a complaint of the breast.^a Being allowed to go home on leave, he did not return, even when sent for by the messengers of Dareius, but remained in Croton and married the daughter of Milo the athlete.^b

Nothing survives of his medical teaching except an anecdote that seems to show that he had a theory regarding the connection between the decay of physical and mental powers.^c

20. PARM(EN)ISCUS

PARMISCUS OR PARMENISCUS OF METAPONTIUM Nothing is known of this early Pythagorean except an anecdote preserved in Delian tradition,^d that having descended into the cave of Trophonius at Delphi he was unable to laugh on his return. He questioned the Delphic oracle and was given an ambiguous answer telling him to visit 'Mother' He went home, but found no cure for his complaint. Chancing to visit Delos, he went while sight-seeing to look at the statue of Leto, Apollo's mother, but finding it to be nothing but an ugly wooden image, he suddenly broke into a laugh at the sight, and thus the Delphic oracle was substantiated.

A list of temple offerings to Artemis at Delos includes 'a silver bowl dedicated by Parmiscus' His name is given in Iamblichus' list, and in Diogenes Laertius is the statement that Xenophanes was 'bought' (apparently rescued from slavery) by Parmiscus and Orestades, another Pythagorean.^e Diels^f points out that this is a 'reduplication' from Diogenes' *Life of Plato*

21 XENOPHANES

XENOPHANES OF COLOPHON was in his prime about 530 B C.

He states in a poem^f that his travels began when he was twenty-five years old, so that if he left Colophon when it was captured by Persia in 545 B C, he was born about 570 and

^a 2a ^b 2a, b, c, 1 ^c 3 ^d 3 ^e 2 ^f B22
¹ *Vorsokr* footnote to ch 21 (Xenophanes) A1 (p 114, l 10)

his prime of life was about 530. Diogenes Laertius, probably following Apollodorus, says 540-37,^a the statement of Apollodorus on Xenophanes' date has been confused or misunderstood by Clement when quoting it.^b Timaeus the Sicilian historian^c said that Xenophanes was a contemporary of Hiero of Syracuse (who reigned 478-467 B.C.) and of Epicharmus (whose prime was 486 B.C.) Xenophanes is mentioned among the Longaevals as having lived to be ninety-one.^d He was still writing at the age of ninety-two, on his own testimony.^e He therefore did not die until about 460 B.C.

Xenophanes was a native of Colophon, and the son of Dexios or Dexinos. A tradition stated that he had no teacher, but there was also an attempt to link him up with other names, such as Anaximander.^f As he left home at the age of twenty-five, his education must have been interrupted, but not before he had acquired the Ionian scientific outlook that made him observe and classify interesting phenomena during his travels. Some say that he took part in the founding of Elea by the Phocaeans in about 540 B.C., and taught there, but from his own words, that he had been 'tossed about Greece' for sixty-seven years,^g it seems unlikely that he settled anywhere for long. He spent time at several Sicilian cities, Zancle and Catane being named,^h he also visited Syracuse, where he saw the famous quarries,ⁱ Lipara, where the volcanic fires interested him,^j Malta, where he saw fossils,^k and possibly Paros,^l though it is possible that he saw a fossil in a block of Parian stone without actually going there. Some spoke of his visiting Egypt, but there is no good evidence for this, and the story told in that connection by Plutarch is given by Aristotle as one of Xenophanes' *bons mots* to the citizens of Elea.^m He mentions the Aethiopians and Thracians,ⁿ but he could have learnt of their religions without contact with them, for he clearly made a study of religions. His travels seem to have been all in the west, unless the words 'over the land of Greece'^o imply wider wanderings. There is no reason to suppose that he did not visit Elea, it is only his settlement there which conflicts with his own words. He is said to have given public recitations of his poems;^p so that this may account for his

^a A1 ^b A8 ^c A8 ^d A6 ^e B22 ^f A1 ^g B22
^h A1 ⁱ A33 ^j A48 ^k A33 ^l A33 ^m A13
ⁿ B16 ^o B22 ^p A1

ceaseless journeyings · he was a travelling rhapsodist, and made his living in that way ¹ He was still active in this profession at the age of ninety-two.

Xenophanes wrote his views in verse only, he used elegiacs and hexameters Diogenes Laertius mentions iambs, but if these existed, none has survived ^a Diogenes Laertius also credits him with two thousand hexameters on the founding of Colophon and the colonization of Elea,^b but the surviving fragments are all expositions of Xenophanes' opinions.

He was as famous for his satirical attacks on the poets and philosophers^c as for his philosophical views His attacks on Homer and Hesiod were thought by some to be inconsistent, since he wrote in verse himself,^d and to be due to personal jealousy, he was accused of attacking the dead.^e His admirers appear to have retorted that Homer was himself the first satirist ^f This element in Xenophanes' work doubtless contributed to his success as a public reciter of his own poems, but there is no sign in what is left of them to show that he used satire to play to the gallery The sincerity and disinterestedness of his strictures on Homer and Hesiod cannot be doubted, and no evidence remains to uphold the statement in Proclus^g (drawn from Plutarch) that Xenophanes 'published monstrous lampoons against all poets and philosophers, on account of a mean spite against the philosophers and poets of his own day'. The only personal attack on a contemporary seems to have been that on Simonides, whom he lampooned as a miser ^h There are also four elegiac lines attacking in a mock-heroic manner a poet who showed his meanness by exchanging a present of a kid's ham for a whole leg of beef,ⁱ this too probably refers to Simonides, though he is not named by the citer There was probably a personal feud between these two, to which one or both of them gave public utterance Simonides spent the latter part of his life at the court of Hiero in Syracuse, where Xenophanes probably encountered him On the other hand, he is said to have admired Thales for having predicted eclipses and other phenomena ^j There is also a fragment which refers to Pythagoras and his doctrine of transmigration,

^a A1 ^b A1 ^c A1, A20 ^d A1 ^e A11, A19 ^f A23 ^g A22

^h B21 ⁱ B6 ^j B19

¹ Burnet (EGP⁴, p. 115) rejects this too lightly If Xenophanes was not a professional rhapsodist, why did he complain of the excessive reward of the athlete 'who is not deserving like me'? (B2)

but it does not reveal Xenophanes' own attitude, whether serious or satirical.^a

Xenophanes' condemnatory poems earned for him later the title of Sillographer, and also the interest of the chief of lampoonists, Timon of Phlius,^b the disciple of the Sceptic Pyrrho of Elis,^c in the early third century. Sextus says that Timon frequently praised Xenophanes; but the fragments of Timon's poems in which Xenophanes figures are satirical.

Xenophanes' interest was deeply engaged by both science and religion, but it is difficult to find what exactly is the unifying principle in his work, whence perhaps he shares with Pythagoras the censure of Heraclitus.^d He gave the impulse to a new movement in philosophy, and to the founding of a school — the Eleatics — which pursued one of his lines of thought, yet it is hard to say what part of the Eleatic doctrine is his. Fortunately, however, important fragments of his own writings survive.

The doxographers, in trying to give a clear report of his tenets, found contradictions in their authorities. For instance, Simplicius, writing of Melissus, Parmenides and Xenophanes, gives an account of Xenophanes which he says is based on Theophrastus, in Theophrastus he found it stated that Xenophanes had said that 'God' or 'The One' was neither bounded nor boundless, neither in motion nor at rest,^e in Nicolaus of Damascus that it was bounded and motionless,^f in Alexander of Aphrodisias that it was bounded and spherical.^g Another instance occurs in connection with Xenophanes' alleged opinion that the earth extends downward to infinity. Simplicius says that he could not find any clue as to what Xenophanes really said, because he himself had not met with the verses of Xenophanes that dealt with this point, and neither Aristotle nor the lines of Empedocles quoted by Aristotle were sufficiently clear.^h ^{h1} Another instance is: some said that Xenophanes made Earth the material cause or substrate, thus using up the only one of the Four Elements not hitherto so

^a B7

^b A35

^c 72A2, cp below, pp 330-1

^d 22B40

^e A31 §2

^f A31 §8

^g A31 §8

^h A47

^{h1} Burnet was wrong in saying that Simplicius said that he had not seen the poems (EGP¹, p 114, note, p 117, EGP⁴, p 126) Simplicius said only that he had not seen any verses dealing with this point τοῖς Ξενοφάνους ἔπεισι τοῖς περὶ τούτου μὴ ἐντυχών. This implies rather that he had seen other parts of the poems.

used; but (says Galen) they misinterpreted him; such a statement nowhere appears in Xenophanes' own writings, and if it had it would have been given in Theophrastus' epitome.^a Another striking contradiction in the authorities concerns the power of God. Xenophanes says that God rules and is the most powerful,^b and so he was reported by some.^c But in the Plutarchian *Stromateis* it is stated that Xenophanes denied that there was any leadership among the gods, for it is not right that any one of the gods should have despotic rule.^d

These points will be discussed later, here they are brought together to show that the doxographers, in attempting to systematize Xenophanes' views, were often at a loss. The general explanation of this is that Xenophanes was a poet, and, like Heraclitus, threw out fruitful ideas which he did not always trouble to work out in detail or to support with cogent intellectual argument. The working out and verification by reason was done by Parmenides and Melissus, and much that they evolved has been foisted on to Xenophanes.^e If we compare the language of the doxographers first with the poems of Xenophanes and then with those of Parmenides, we can see clearly that the process has been to refer back the systematic thought of Parmenides to the man whose ideas helped to inspire him. The extreme example of this is the late, possibly Peripatetic, essay entitled *On Melissus, Xenophanes and Gorgias*^f (if indeed the middle portion does refer to Xenophanes, which has been doubted). It ascribes to him a complicated and wholly Eleatic reasoning in support of a number of contradictory predicates about Being, and proceeds to show the flaws in this reasoning. This mistaken ascription of Eleatic thought to Xenophanes probably owes its origin to Aristotle and Theophrastus, they explained Xenophanes in the light of the later Eleatic school in order to bring out his significance for metaphysical philosophy, and this was misunderstood by their pupils and successors.

Aristotle, and after him Theophrastus, quite definitely placed Xenophanes outside the Eleatic school, as its unconscious, not deliberate founder. Aristotle thought nothing of Xenophanes as a thinker, he places him exactly where we

^a A36, cp A32, A33^b B23, B25^c A31 §3^d A32^e e.g. A1, A31, A32, A33, A35, A36, A49^f A28

should expect from the fragments of the poems we possess. He says in the *Metaphysics*,^a 'Parmenides, it seems, treated of the conceptual One, Melissus of the material One, that is why the former makes it limited, the latter unlimited. But Xenophanes, who was the originator of this attempt to reduce things to a One (Parmenides being alleged to be his pupil) gave no clear account, and does not appear to have touched upon either of these kinds of existences, but directing his gaze to the whole heavens he says that God and the One are identical. These, therefore, as I have said, can be dismissed for the purposes of our present inquiry, and two of them indeed altogether, because of a certain crudity, namely Xenophanes and Melissus'^b And elsewhere he includes Xenophanes in an even more cutting censure, saying, 'Some have said that the downward extent of the earth is infinite, being rooted in the Boundless as Xenophanes says, their motive was to save themselves the trouble of looking for the right explanation'. Similarly Theophrastus,^c copying his master, attributes to Xenophanes the view that Being is One, but 'admits' (as Simplicius puts it) that Xenophanes' views do not really belong to a record of scientific and metaphysical inquiry.

Xenophanes met with better appreciation in another quarter. his attacks on the legends about the gods as narrated by the poets, especially Homer and Hesiod, had an effect quite as far-reaching, both on poetry and on philosophy, as the metaphysical doctrines he seems almost accidentally to have fathered. His contemporary Epicharmus, the comic dramatist of Syracuse, was keenly interested in the thought of his day, and introduced obvious references to Xenophanes into his plays. One of the fragments of Epicharmus is an imitation, perhaps parody, of Xenophanes' view that each creature makes its god in its own image,^d another looks like a retort to Xenophanes' famous lines about God 'He sees as a whole, thinks as a whole, hears as a whole'.^e Epicharmus wrote 'Mind alone sees, mind alone hears, all else is deaf and blind'.^f Epicharmus and Xenophanes were said to have been at variance, and Epicharmus to have said insulting things about Xenophanes;^g but this is an

^a A30^b A47^c A31 §2^d 23B5^e B24^f 23B12^g Alex Aphrod *ad* Aristot *Met* 1010a See Norwood, *Greek Comedy*, p. 86^h B24 οὐλος ὁρᾷ, οὐλος δὲ νοεῖ, οὐλος δὲ τ' ἀκούειⁱ 23B12 νοὺς ὁρᾷ καὶ νοὺς ἀκούει τὰλλα κωφὰ καὶ τυφλά

invention, based on a remark in Aristotle's *Metaphysics*^a,^{a1} which implies that Epicharmus said against Xenophanes, 'He speaks truly, but improperly' This appears to mean that Epicharmus agreed with Xenophanes' views (probably about the gods) but objected in some way to his manner of expressing them. And the two fragments quoted above show no hostility, not even necessarily disagreement.

Another poet whom Xenophanes seems to have influenced by these views is Pindar; they may easily have met in Syracuse Pindar in his First Olympian Ode, addressed to Hiero of Syracuse in 472 B.C., writes an *apologia* for his art, declaring himself to be the right kind of poet — truthful, and saying no evil of the gods, in retelling the story of Tantalus, he repudiates the idea that the gods can be cannibals, and says he speaks in opposition to his predecessors in poetry Pindar's claim to be truthful and pure, as opposed to the epic poets, may have been called forth by the strictures of Xenophanes, not on himself but on poetry Again, Xenophanes censures excessive adulation of athletic prowess,^b Pindar tries to prove himself justified in extolling the Games Pindar's frequent anxiety to refute censure may arise from a wish to satisfy the requirements of Xenophanes and his admirers^c

Later, Euripides directly imitated Xenophanes in the *Heracles* and the *Autolycus*.^c By this time the need for the purification of mythology had become a commonplace of discussion, Euripides made it the driving force of several of his plays, and put speeches about it into the mouths of his characters^c

For the influence of this side of Xenophanes' work on philosophy, we need only point to the Second and Third Books of Plato's *Republic*, where the poets are subjected to expurgation according to the canon of a conception of God as One, Indivisible, Unalterable and wholly Good So closely does Plato follow the lines laid down by Xenophanes that his procedure is to take first 'the Deity', and then 'the gods, daemons

^a A15 ^b B2 ^c 21 (Xen) C

^{a1} διδ' εικότως μὲν λέγουσιν, οὐκ ἀληθῆ δὲ λέγουσιν οὕτω γὰρ ἀρμόττει μᾶλλον εἰπεῖν ἢ ὥσπερ 'Ἐπιχάρμος εἰς Ξενοφάνην *Met* 1010a See Diels' note, quoting Gomperz, who attributed to Epicharmus the phrase εικότως μὲν οὐκ ἔφα τόδ', ἀλλ' ἀλαθέως ἔφα, and connected it with the religious teaching of Xenophanes

^b Pind *Ol* I, 36 ἔστι δ' ἄνδρι φάμεν εἰκός ἀμφὶ δαιμόνων καλὰ μείων γὰρ αἰτία

^c See for example *Iph Taur* 386 sqq, taking the same story as Pind *Ol* I The speech ends οὐδένα γὰρ αἰμαὶ δαιμόνων εἶναι κακόν

and heroes', just as Xenophanes says, 'There is one God, among gods and men the greatest'.^a It may be added that one of the fragments depicts a scene something like Plato's City of Pigs.^b

The views by which Xenophanes influenced the metaphysical side of philosophy are two — on the nature of the deity, and on the nature of knowledge.

Of the first, he said that God is One, among gods and men the greatest,^c that he sees, thinks and hears with the whole of him,^d that he governs all by means of mind, without toil,^e that he remains always in one place and does not move, for it does not beseem him to change his position from time to time.^f

This is not in itself a contribution to metaphysics, as Theophrastus observed,^g and it was the attempts to expound it in a metaphysical way that led to the contradictions already mentioned. Metaphysics, given this 'God' who is One, wishes to know more about him. he is not the only god, as is seen from Xenophanes' own words. Is he the whole universe? What is his relation to the visible universe? If he is the Whole and contains the parts, how can he be said to be 'greatest'? If he rules, he must have something to rule over; such a predication implies that he is not the whole. Xenophanes says that he is 'the greatest', and 'governs all by the thought of his mind', one authority says that Xenophanes said that there was no rulership among the gods, for it is not right that any of them should play the despot. (The explanation of this is that Xenophanes meant that God was not a ruler in the anthropomorphic sense. not a prince or tyrant.) Further, metaphysicians asked, is this God bounded or infinite?^h We are told that he sees and hears 'with the whole of him', has he therefore a shape? If so, is it circular like Parmenides' Being? None of these questions finds an answer in Xenophanes, they were not even thought of or raised by him.

The idea of Xenophanes on the nature of the deity must be looked at in quite another way. as the result of his attack on the anthropomorphism of the poets. His view of God is not an abstract and metaphysical concept, it is the direct attempt to replace features which he disliked in the poets' conception of the deity. His own concept of God, therefore, is relative to the concept he was trying to displace. Man conceives God after

^a B23 ^b B22 ^c B23 ^d B24 ^e B25 ^f B26 ^g A31 ^h A31 §7, cp. §5

his own image; therefore Man has many gods, the product of different nations, different minds. These gods have the characteristics of their inventors — clothes, bodies, a voice, like all mortals,^a particular features according to the race that conceives them: Aethiopian gods are black and snub-nosed, Thracian gods have red hair and grey eyes.^b They even have the sins of mortals, according to Homer and Hesiod.^c By this method every creature that has powers of expression can invent and describe his own deity according to his kind. Lions, horses, oxen lack this power of expression, they have no hands and cannot depict, otherwise they too would have their deities, made like themselves.^d ^{d1} Man, who has the power of expression, can describe his deities at will, we see the result in Homer and Hesiod, who are the instructors of all.^e No wonder that the worship paid to the gods is all wrong, the sacrifice and prayer are offered as to a divinity, but the ritual implies that its object is human, for example, the lamentation at Elea for Leucothea, and of the Egyptians for Osiris.^f

The method of conceiving God has been wrong, a new concept must be substituted, purged of all human elements. God must be thought of as having complete power (not as a human king has power), freedom from human limitations — absolute moral goodness, unrestricted knowledge (that is, unlimited perception and intelligence), and stability in his condition of being the best. By this method we arrive at a concept of a God who is really greater than Man, the greatest thing in the universe. Thus regarded, as a relative concept, Xenophanes' God becomes intelligible. It is only when the test of the absolute — the metaphysical demand — is made on him that he dissolves into contradictions.

It is worth while to point out that Xenophanes' personal aspirations must have gone into the composition of his deity.^g It may be that this affords an explanation of the fragment: 'He always remains in the same place, moving not at all, and it is not proper for him to change his position from time to time.'^h

^a B14 ^b B16 ^c B11, B12 ^d B15 ^e B10 ^f A13 ^g B26

^{d1} cp Rupert Brooke's poem *Heaven*

¹ The influence of the thinker's own psychological make-up on his conception of the Cosmos and its laws has not yet been sufficiently studied in connection with the early Greek thinkers. If the term God is used, we may be sure that subjective factors play a large part in the concept, God is an ideal, but a human and also a personal ideal cp the Fire of Heraclitus, and the Nous of Anaxagoras

Gomperz observed the significance of the word 'proper'; he commented: 'We cannot help smiling at the sight of the stout assailant of anthropomorphism made the victim of an anthropomorphic attack.'¹ But it is possible that Gomperz partly mis-took the analogy. The point is perhaps not, as he says, 'that the chief of the gods must not hurry officiously to and fro like an obsequious serving-man, he must cultivate the majestic inactivity of a King on his throne'. It is rather that God, being a King, is not a traveller to be tossed about hither and thither as Xenophanes was;^a he has rest and stability, which Xenophanes must sometimes have longed for. As God has bodily rest, so too he has not the toil of the intellect, his perception is unlimited, and the power of his mind untrammelled.^b But Man has to seek knowledge by long labour.^c The way of the thinker, like the way of the traveller, is sometimes toilsome, God is endowed with ease.

The God of Xenophanes, then, is made up of these two ingredients the intellectual concept of a deity stripped of obviously human qualities, and the thinker's desire for greater intellectual power and freedom from wanderings. Xenophanes' God is therefore still anthropomorphic, as being described from a human standpoint; but his God is better than the thieving adulterous gods of Olympian theology because he represents a human ideal which we know by experiment and experience to be an advance. Also, he is better because of the attempt made to purge him of particularity, such as nationality, and to make him universal.

Did Xenophanes claim to do more? Did he claim objective reality for his deity? This brings us to the second point his views on the nature of knowledge. In two fragments^d he denies the possibility of absolute and objective knowledge: no man born ever has known or ever will know the truth about the gods or any of the other things discussed by Xenophanes; for even if he happened to hit exactly upon the absolute truth, he himself cannot know that he has done so, 'for in all things' (or, 'to all men') 'only Opinion is decreed', that is, it has been decreed that only conjecture is possible. 'Here then let these Opinions stand — in resemblance to the reality.' It is this doctrine which led some^e to say that Xenophanes was the first to

^a B8^b B25^c B18^d B34, B35^e B35¹ Gomperz, *Greek Thinkers*, Vol. I, p. 159

state that the Whole is unintelligible, a crude and misleading way of paraphrasing him. It is clear, however, that Xenophanes was well aware of the difficulties that later were to lead to the agnosticism of the Sophists. He did nevertheless believe in, or rather did not question, the existence of an absolute truth, and claimed that his opinions resembled it. He could not claim to have stated the absolute truth about the deity or anything else, for he knew of no means by which to judge if he had, but his views were not intended to be regarded as subjective, and he put forward his concept of God as that proper to Man, not merely to Xenophanes, and as being similar to the truth. Further than that he does not go in the search for the criterion of knowledge.

That he speaks of 'gods' as well as one God has aroused great discussion among modern interpreters, who want to place him in the category of either monotheist or polytheist. But the question of how there can be one god and many gods was not difficult for Xenophanes, because he was not thinking in terms of the One and the Many, as the Eleatics were. Xenophanes did not work it out because he did not arrive at the question, it was enough for him to say that the deity in its fullness and completeness was one, and then to speak of 'gods' or subdivisions of the divine power. That he meant by 'God' the whole material universe that we see, and by 'gods' other manifestations, reducing them to special natural phenomena, seems unlikely. He did equate Iris to the rainbow,^a a very easy identification, and he said that the Dioskouroi, the lights seen on ships, were ignited clouds.^b He may have treated the sun- and moon-deities in the same way, since he regarded these bodies as passing clouds constantly renewed. We have a verse^c in which he explains the title of the sun, Hyperion, as meaning 'the one who goes above', and he spoke contemptuously of the moon as 'redundant'.^d But it does not necessarily follow that he disbelieved in the existence of Apollo and Artemis in the sense of divine forces ruling in these spheres, whose powers were delegated to them from the supreme power. He would wish to strip them of obvious human attributes, and especially of anything shameful, as he did in the case of the supreme deity; but not necessarily to reduce them to natural phenomena. Further, the One God had perception in all his parts, and

^a B32^b A39^c B31^d A42

governed all things by means of Mind, this could not be said of the visible universe. Again, in his poem^a describing the orderly and decent ritual that is a fitting worship for the gods, he says that God must be hymned with reverent strains and pure words, he objects to stories of Titans, Giants and Centaurs and their warfare and strife, because they are figments and there is no use in them, but 'ever to pay heed to *the gods*, that is good'. These are not the words of a man to whom the gods were natural phenomena.¹

His ethics, in so far as we have any record of them, are the typical Greek Sophrosyne. Orderly religious festivals,^a no drunkenness^a (perhaps he censured the Dionysiac orgies, he refers to them),^b a way of life that is a mean between asceticism and Oriental luxury,^c censure of excessive adulation of athletic prowess, because bodily skill is inferior to mental ability and because athletics bring no advantage to the community.^d There is a hint that he objected to dice-playing,^e he also disliked avarice and meanness.^f

He tells a story about Pythagoras, that he once stopped a man from beating a dog, because he recognized its voice as that of a friend's soul.^g It has been suggested that this is told satirically, but there is nothing in the diction to prove this, and it was not so regarded by those who quoted it. It may equally well have been told in sympathy or impartially.

The cosmology of Xenophanes is not, like that of the Ionians, an application of a metaphysical theory to the visible world, the doxographers, trying to treat it as such, fell into difficulties. They begin by describing a First Cause, which is the One, this being (though they do not say so) Xenophanes' God. They give to the One the metaphysical and Eleatically-expressed attributes corresponding to what Xenophanes said of his God,^h getting involved in contradictions. When they go on to look for a cosmology, they find Xenophanes talking about earth and water 'everything comes from earth and goes back to earth',ⁱ 'we are all produced from a combination of earth and water',^j 'all creatures that come into being and exist are earth and water'.^k Hence Theodoret, quoting Aetius, complains that

^a B1 ^b B17 ^c B22, B3 ^d B2 ^e A16 ^f B21, B6 ^g B7

^h A1, A31, A32, A33, A35, A36, A49 ⁱ B27 ^j B33 ^k B29

¹ Burnet, EGP⁴, pp 127-9, takes the opposite view, and dismisses the use of 'the language of polytheism in his elegies' as being 'only what we should expect'

whereas Xenophanes said that the Whole was one, circular and limited, not begotten but eternal and wholly immobile, he 'forgot these theories and turned round and said that everything came from earth',^a and he then quotes the line, 'everything comes from earth and goes back to earth'. Now we have the weighty testimony of Aristotle in the *Metaphysics*^b that none of the early physicists gave Earth as the primary substance. We must therefore believe that the significance of the above line has been misunderstood by the doxographers, in their desire to get a metaphysical theory out of what Xenophanes says; and that the fact is that he was commenting on the phenomena he saw around him on the physical plane, and is not suggesting that Earth is the substrate

His cosmology was as follows

There is the earth and the vault of heaven; the earth is boundless and not surrounded on all sides by air or by the heavens.^c The only limit is that on top at our feet, downwards the earth goes to infinity.^d These are Xenophanes' own words, so too, it appears, is the expression that the earth is 'rooted in infinity' quoted by Aristotle.^e This statement purported to explain why the earth stays in position, and was apparently meant as a correction of the views of Thales and Anaximander, it called forth from Aristotle the scornful comment that it saved its adherents the trouble of finding out the real cause. Simplicius tried to defend Xenophanes from the censure of Aristotle, and also Empedocles,^f by suggesting that not the earth itself but that into which it descended was what Xenophanes meant to describe as infinite, but Simplicius had not seen Xenophanes' own words, as he admits, and was relying on the ambiguity of the term.^{g, h} In Empedocles' verses which Aristotle quotes Xenophanes' own words^h can mean nothing other than that the Earth itself goes down infinitely far in its under side, with the help of Aristotle's quotation we see that Xenophanes thinks of the earth as anchored by infinitely long roots. Xenophanes was acquainted with the work of Thales,ⁱ perhaps he felt that if the earth floated on water as Thales said, it would move about. It is possible that Xenophanes thought that the earth was rooted in water like an island. Pindar des-

^a A₃₆^b 989a5^c A₁₂, A₃₃^d B₂₈^e A₄₇^f 31B₃₉^g A₄₇; 31B₃₉^h B₂₈ⁱ B₁₉^g γῆς βάθος

cribed the island of Rhodes as 'growing up from the bed of the sea',^a and as 'blossoming forth from the salt waters',^b perhaps Xenophanes had used such an analogy when speaking of earth, and Pindar got the idea from him. The rising of the islands of Rhodes and Delos from the waves would impress Xenophanes, and would be the kind of phenomena that would tally with his other observations on the cycle of creation: first the earth from the moist mixture, then the wearing away of earth into the waters again. That he used the physical history of these islands to illustrate a theory of the destructibility of the world seems likely. There exists a treatise (attributed to Philo) *On the Indestructibility of the World*,^c in which Theophrastus' summary of the arguments on the other side is given. There can be little doubt that those of Xenophanes are included, and in this passage the rise of Delos and Rhodes is referred to, and Pindar's verses on Delos are quoted. Thus that Xenophanes used this piece of knowledge is almost certain, and it is possible that Pindar got it from him. It is also possible that Xenophanes carried the analogy further, and regarded our earth as having arisen from the waters like those islands; as being now rooted in them, and as fated ultimately to perish back into them again.

As there is no limit to the earth underneath, and it is not surrounded by air and the vault of heaven, it follows that the heavenly bodies do not travel round it. There are many suns and moons, passing over the different zones of the earth and never returning, new ones come along all the time.^d

The heavenly bodies have their origin from the earth, the stars, suns and moons are made up of clouds, that is, of moist exhalations which are ignited (he does not say how).^e The stars are lit up at night like coals, and quenched in the day-time.^f The moon likewise is a condensed and ignited cloud, its light being its own, its monthly phases are due to quenchings and ignitions.^g So too the sun, it is an accumulation of smaller fires, the fires formed from moist exhalations, and is new every day.^h Similarly with comets, shooting stars and meteors, and lightning: all are accumulations and movements of clouds.ⁱ The changes of the sun are all quenchings.^j The quenchings seem quite arbitrary: the sun goes out when it comes to a part

^a *Ol* VII, 62 ^b *ib* 69 ^c *Dox Gr* p 486 ^d *A*13, *A*41a ^e *A*32, *A*33, *A*38, *A*40
^f *A*38 ^g *A*43 ^h *A*40, *A*32, *A*33 ⁱ *A*44, *A*45 ^j *A*41

of the earth not inhabited by man,^a this doubtless is because the object of its existence is to be useful to man and other living creatures; he points out that while the sun is thus useful, the moon is a superfluous adjunct^b The sun, or rather suns, really go off into infinity, but they appear to go in a circle 'because of the distance',^c that is, he had observed that parallel lines appear to converge, or perhaps that objects such as ships disappear below the horizon The rainbow is also an ignited cloud, though men call it Iris and personify it^d

These quenchings and ignitings are inadequate enough even when their cause is left arbitrary, but the task of arranging these opinions becomes absurd when we read in Aetius that the *sun* is the cause of the exhalations which result in the clouds, which when ignited become the heavenly bodies^e Perhaps Xenophanes did not actually say this, in the fragment on which Aetius (very naturally) bases this statement, there is no mention of heat, it merely says that the sea is the source of water and winds and clouds^f Xenophanes does say that 'the sun goes above (hence his name Hyperion)¹ and warms the earth',^g but he does not say that the sun is the original cause of the exhalations from which the suns themselves are produced He leaves the cause unexplained.

Living creatures, including Man, are the product of a mixture of earth and water^h This universe together with its inhabitants came out of mud,ⁱ the universe was formerly all mud, and it will some day become all mud again, because the earth will all be carried down to the sea Then the human race and this universe will perish and a beginning of becoming will be made again Thus there are many worlds, all perishable, succeeding one another, and this arising from and return to mud is the cause of change in them all^j

These opinions seem to have been based on some original and accurate observations. the study of the percolation of water, and its effect on land, and the observation of fossils He had also noticed phosphorescence, and studied volcanic fire.

Water trickles through the earth, and that is why the sea becomes salt, because of the products brought to it by the

^a A41a ^b A42 ^c A41a ^d B32 ^e A46 ^f B30 ^g B31

^h B29, B33 ⁱ A31, A1

¹ cp Pind *Ol* VII, where he tells how the Sun-god ('Υπερίων/ῥας, 1, 39), as he travelled above, noted the island of Rhodes below the surface of the sea

² This is derived from Anaximander, see above, p 62

water that feeds it,^a we see the water dripping from the walls of caves.^b The water wears away the land at present, but formerly the water and earth were mixed (mud) because the shells of sea-animals are found far inland and among mountains, also he had observed the 'imprint'^c of a fish and of seals^d in the quarries of Syracuse, of a sardine^e in the middle of a piece of Parian marble, and 'flat prints'^f of all kinds of marine creatures at Malta. Then there followed a process of drying, the prints were dried in the mud.^g He surmises from this that the opposite process is now taking place the water is wearing away the land, bringing down its products to the sea, and so one day it will become mud again. This circularity of process is a favourite idea with the Greeks, and is accepted by Xenophanes since his observations seemed to confirm it.

The possibility of the ignition of clouds, which plays such an important part in his cosmology, seems to have been confirmed for him by the observation of the *Dioskouroi*, the 'star-like apparitions on ships', which he said were cloudy matter shining because of some kind of motion.^{d, d1} Here we have a hint of the cause of the ignitions, motion. This being so, it is easy to explain comets, meteors and shooting stars, as well as the other heavenly bodies. The fiery cloud above the crater of volcanoes also seemed to him to lend support to this view, he had seen the volcanic fires on Lipara,^{e, e1} and he must have been familiar with Etna.^f

^a A33

^b B37

^c A33

^d A39

^e A48

^{d1} Anaximenes had said that the cause of the sun's heat was the swiftness of its motion, see p. 67. The view that the heavenly bodies are ignited clouds is in fact taken from Anaximenes, who said that they were 'condensed air', which at this time means the same thing.

^{e1} He noted that it had once 'suffered eclipse' (ἐκλιπεῖν) for sixteen years, and had returned in the seventeenth year. It is clear that he was using it to illustrate his theme of the ignitions and quenchings of heavenly bodies.

^f τυπός

^g 'seals' (φωκῶν). This was emended by Gomperz to φωκῶν (seaweeds) on the ground that the former involves a palaeontological impossibility. See n. 3 below.

^h 'sardine' (ἀφύνη). This was proposed by Gronovius for δάφνη (laurel), the MS. reading. It is possible that Xenophanes observed vegetable as well as animal fossils, and that the MS. reading should be retained. Pompeckı states that the testimony about Syracuse (fish and seals) and Malta are completely credible, but that neither 'laurel' nor 'sardine' is possible at Paros, he therefore reads Pharos (Lessina on the Dalmatian coast) where fossil fish are found in abundance. See Diels, *Vors.* note, Vol. I, p. 123.

ⁱ πλάκες

^j cp. Pindar's description of Etna, *Pyth.* I, 20. 199. Ποταμοὶ δ' ἀμέραισιν μὲν προχέοντι ῥόον καπνοῦ αἰθέων. There was an eruption of Etna in Ol. 76, 1 (476 B.C.) according to Thucydides III, 116 (see Christ on Pind. *Pyth.* I). This Xenophanes may have seen.

These few observations at one end of the scale, and the new concept of God at the other, are the valuable parts of Xenophanes' work. The attempt to connect all into one scheme was beyond his powers. The logical sifting of the concept of God, its connection with the One, and the derivation of the visible universe from it, were beyond his intentions, to him, the question in its metaphysical form did not arise.

22 HERACLEITUS

HERACLEITUS of EPHESUS was in his prime about 500 B.C.

There is no reason to doubt the traditional date for his prime of life. the sixty-ninth Olympiad, that is, 504-501 B.C.^a But since this is, as usual, merely a rough guess, it serves to place him a generation later than Pythagoras and Xenophanes, whose views he opposes,^b and a generation earlier than Parmenides, who in turn opposes the views of Heracleitus. Tradition states that he died at the age of sixty.^c

The tradition regarding his life and death is most unsatisfactory, for it is all obviously an attempt to dramatize his writings. From these, one thing emerged clearly for the anecdotists: his 'pride', as they called it; that is, his low opinion of his fellows.^d Thus we get a number of anecdotes based on this idea: he refused to take part in politics, because he disapproved of the Ephesian constitution, and retired, first to the temple of Artemis, then to the mountains, where he ate grass.^e He preferred to play knuckle-bones in the temple with the children, rather than be a politician.^f He withdrew from his position of Basileus, an office hereditary in his family and carrying with it certain public marks of honour,^g in favour of his brother.^h He had no teacher (though some wished to connect him with Hip-pasus, others with Xenophanes) but learnt everything by self-investigation.ⁱ Though contemptuous of his fellow-citizens, he was not more partial to others: he refused with scorn an invitation from King Darius to visit his court,^j and even preferred unpopularity at home to life at Athens.^k These tales are clearly based on his character as it emerges from his writings. his

^a A1 §1, A1a^b B40^c A1 §3^d A1 §1^e A1 §§2, 3^f A2^g A1 §6^h A1 §5, A1aⁱ A1 §12, A3^j A1 §15

many expressions of contempt for others, his condemnation of the Ephesians for their expulsion of Hermodorus, his views on tyranny and so forth

The tales of his death are likewise obvious inventions. he retired to the mountains and ate grass, so that he contracted dropsy. The doctors were unable, when challenged, to cure him, so he plastered himself with dung and hoped that the moisture would be steamed out of him by the heat. Nevertheless, he died.^a There were variants of this absurd story: some said that he was eaten by dogs; others that he was cured, and died of another complaint.^b But its obvious basis is Heraclitus' own view that heat is life and water is death, with which is combined his remark that 'corpses are more fit to be thrown out than dung';^c the rest is achieved by the anecdotist's desire to show arrogance coming to an evil end.

Aristotle tells an anecdote of Heraclitus' being visited by friends who found him warming himself by the stove, he bade them come in and not be afraid, for there were gods here also.^d The moral of the story for Aristotle is that one must not allow anything to put one off in biological research, as everything has its share in nature and beauty, but the anecdotist was clearly thinking of Heraclitus' views on Fire, and attributing to him the saying elsewhere attached to Thales and his experiments with the magnet and amber.^e

Lastly, there is a story that he helped the Ephesians in their war against Persia, by indicating that success depended on their sacrificing for a time their luxurious way of living. This he did by means of a symbolic act. he mixed before the assembled people a barley-drink, and thus convinced them without a word.^f This story is based on his prayer that the Ephesians might never cease to be wealthy in order that their wickedness might be detected,^g and his use of the analogy of the cheese-drink;^h it is one of the many such stories which exhibit wise men helping their states in time of war, for example Thales and Pythagoras.

Thus we can be certain of nothing in his life, which seems to have been devoted to thought, and not to have included even any travels. He was probably an aristocrat by birth, and as he lived at Ephesus, not at Miletus, his originality was not tem-

^a A1 §3, A1a^b A1 §5^c B96^d A9^e 1A1 §24, 1A22^f A3b^g B125a^h B125

pered by too close contact with fellow-workers. The rest is unknown.

He is said to have written one book, that was divided into three parts: metaphysical, political and theological,^a one grammarian, Diodotus, absurdly maintained that the book was not anywhere concerned with metaphysics, but really with politics, the parts about nature being introduced for the sake of analogy.^b It is unlikely that the division into three parts was the work of Heraclitus, the subject-matter is too closely interwoven for that. But some such attempt may have been made by a later, perhaps Alexandrian editor.

What most impressed commentators was the obscurity of his exposition. They accepted this as being the fault of Heraclitus, not of his readers, and were apt to round off their paraphrases with a complaint that 'he expounds nothing clearly'.^c Aristotle (and others copying him) attributed this to the punctuation and the lack of connecting particles.^d Others accused Heraclitus of having done it deliberately, in order that the book should be tackled only by men of ability, and should not be taken too cheaply by the common herd,^e just as Solon was accused after his own day of having written his legal code obscurely, to provide work for his new jury-courts. Even Theophrastus foolishly suggested that Heraclitus had written his work incompletely in places, 'through spleen'.^f It was, however, admitted by others that he sometimes expressed himself with brilliant clarity, so that even the most stupid could easily understand and experience an uplifting of the soul, but, they added, the brevity and difficulty of interpretation are unparalleled.^g

This universal complaint is embodied in a story that Euripides once lent the book to Socrates, and when he asked Socrates what he had thought of it, the latter replied 'Splendid, what I have understood, also, I believe, what I haven't understood — except that it needs a Delian diver.'^h Others attributed this *mot* to one Crates, who first brought the book to Greece.ⁱ

The truth is, of course, that Heraclitus though not deliberately concealing his meaning, used a pungent oracular style, partly because he admired it, partly because he could not

^a A1 §5 ^b A1 §15 ^c A1 §8 ^d A4 ^e A1 §6 ^f A1 §6 ^g A1 §7
^h A4 ⁱ A1 §12

do otherwise. The profundity, yet to him obviousness, of the truths he wished to expound could not be expressed in any other way. Further, believing as he did that mankind are dull and stupid, he wished to arrest attention; but his paradoxes aim at startling men into recognition of the truth, not at creating an effect of rhetorical skill, and this is why later imitations of him are so irritating. His admiration of the Sibyl and of the Pythian Oracle shows that he was conscious of the nature of his own instrument. 'The Sibyl', he said, 'with raving lips, uttering her unlaughing, unadorned uncensored message, reaches out with her voice through a thousand years with the help of the god',^a and, 'the lord whose oracle is at Delphi neither speaks nor conceals, but indicates'^b These are surely his own models that he is praising. But he detested rhetorical trickery, and is said to have referred to some unknown rhetorician as 'the prince of quibblers'^c

His epithet *Skotetos*, the Obscure, is first found in the Aristotelian treatise *de Mundo*,^d it is quoted by Suidas as if it had been attached to him as a nickname during his lifetime.^e It was probably only one of many such epithets earned by his book. Timon the lampooner applied a whole string to him: 'the Crower, Mob-reviler, Riddler Heracleitus'.^f He is said to have deposited the book as an offering at the temple of Artemis in Ephesus.^g

The doxographical tradition about Heracleitus is unsatisfactory. Summarizers tried to treat him on the lines of the previous Ionian philosophers, the scientists of Miletus, and dealt chiefly with his cosmology. This cosmology was not clear-cut and objective, like those of the three Ionian Monists; there was in it an element of symbolism, and an abstractness that made it applicable to far more than the material universe. Thus, where it seemed to show gaps, it offered itself to the imposition of the reader's own views: the Stoics, for instance, imposed on it their own idea of a World-Conflagration.^h

Again, Heracleitus was an artist as well as a scientist; and therefore, though his style with its metaphors, its suggestive brevity, its antitheses and general uncompromisingness, perfectly conveyed his meaning, it was naturally full of puzzles for the paraphraser. The scientific or physical content could be

^a B92 ^b B93 ^c B81 ^d B10 ^e A1a ^f A1 §6 ^g A1 §6 ^h A10

extracted and isolated, but the essential teaching that is Heraclidean — the most valuable part — was necessarily left behind.

The isolation of the scientific content was done as well as could be expected by the writer of the summary in Diogenes Laertius.^a Diels believes this to rest on what he calls the *Vetusta Placita*, an epitome based directly on Theophrastus. Theophrastus doubtless derived his views from Aristotle, who sums up the work of Heraclitus with his usual brilliant brevity in the *Metaphysics*.^b Plato was deeply read in Heraclitus, and in the *Theaetetus*^c gives a brilliant satirical picture of contemporary Heraclidean. He was particularly impressed by Heraclitus' doctrines of Flux and Relativity, but does not discuss his detailed cosmogony, so that this isolation of the scientific content goes back to Aristotle. But Heraclitus was the kind of thinker who could be understood better by a Plato than by an Aristotle — hence the unsatisfactoriness of the doxographical tradition.

Fortunately, however, over one hundred and twenty extracts from Heraclitus' book survive. The wording was such that it impressed itself and demanded quotation, especially when summarizing failed. The form and matter are inseparable, and the whole can never be exactly paraphrased. It is above all things necessary to go to the original in order to grasp Heraclitus' thought.

The arrangement of the surviving fragments is a matter of conjecture, they can be roughly grouped according to subject-matter, and this is what is attempted by editors,¹ though much is left to individual predilection. There is no certainty that any of these arrangements is that of Heraclitus' book, the surviving sentences are quoted by various ancient writers for various reasons, and the connecting links are lost. If then the original was difficult of interpretation to ancient readers, our own mutilated version is very much more so, this must be read and re-read many times in order to obtain even a dim conception of the whole.

The result of the abstraction of his scientific and metaphysical doctrine by the summarizers is as follows

^a A1 §§7-11

^b A5

^c 179E-180C

¹ It is wrong to state as Burnet does (EGP⁴, p. 132 n.) that Diels 'has given up all attempt to arrange the fragments according to subject'. Burnet prefers the arrangement of Bywater, which he uses for his translation.

He said that the material substrate was Fire; and one of the ways in which he uses it is exactly that of the other Ionian Monists with their substrates. real material Fire was the ultimate matter out of which all things come and into which all things return.^a It is able to undergo transformations, and so to produce the other substances Air, Water and Earth.

The process by which these transformations occur, and their cause, appear in the summarizers as a rather confused restatement, with some additions and divergences, of the processes thought out by Anaximander and Anaximenes. Particular things come out of Fire, and are destroyed back into it, their coming into being is 'in accordance with fate'^b

The details of the cosmogony as described by Heraclitus led the paraphrasers to use the Anaximeneian terms Rarefaction and Condensation; Aristotle does this in the *Metaphysics*.^c But there is no trace of this in the fragments, and it is probable that these terms were engrafted on to Heraclitus' scheme at this point because the paraphrasers could find no scientific technical term there. The only such term that is new is Exhalation,^{d, d1} and this is so frequently repeated in the summaries that it probably was the word they found in Heraclitus' own writings.¹ This word refers to what Heraclitus calls 'the upward path', that by which particular existences return to Fire. There is no corresponding term for the 'downward path', that by which other substances are created from Fire. Thus it appears that, just as Anaximander was more interested in the process of Becoming, and so gave only the term Separation Out or Off, so Heraclitus was more interested in the process of Passing Away, and so gave only the term Exhalation. His whole attitude to life, and the effect he had on later thinkers, tends to confirm this view, his attention was upon the so-called destructive forces of War and Strife, and he certainly laid such great stress on the return to Fire that the Stoics saw in it their World-Conflagration,^{e, e1} and the Christian fathers their Hell-Fire.^{f, f1}

^a A1 §§7, 8, A5 ^b A1 §§7, 8, A8 ^c A5, cp A1 §8

^d A1 §§9, 10, 11, A5, A11, A12, A14, A15, B12 ^e A1 §8, A10 ^f B14, cp B31

^{d1} ἀναθυμίασις. The word literally means a rising-up of vapour or smoke. Exhalation, though not accurate, is used in default of a single term that would be exact

^{e1} ἐκπύρωσις

^{f1} Cp *Epist. ad Diognetum*, ch VIII. Ἡ τοὺς κενούς καὶ ληρώδεις ἐκείνων λόγους ἀποδέχη τῶν ἀξιολύστον φιλοσόφων, ὧν οἱ μὲν τινες πῦρ ἔφασαν εἶναι τὸν θεόν (οἱ μέλλουσι χωρήσειν αὐτοί, τοῦτο καλοῦσι θεόν) οἱ δὲ ὕδωρ, οἱ δὲ ἄλλο τι τῶν στοιχείων τῶν ἐκτισμένων ὑπὸ θεοῦ

¹ Burnet disagrees. EGP⁴, p. 151, n. 2

The difficulty felt by commentators comes out well in the epitome preserved in Diogenes Laertius.^a 'His detailed doctrines are as follows that Fire is the Element, and that all things are "an exchange of Fire", coming into being by rarefaction and condensation. But he expounds nothing clearly.' Here we see that the term used by Heraclitus — Exchange — to cover both sides of the process of Coming-into-Being and Passing-Away, was not felt to be sufficient, and the terms familiarized by Anaximenes, rarefaction and condensation, were therefore inserted as a kind of gloss at this point. 'Exchange' was not a concrete, scientific term, but metaphorical, Heraclitus' own words were 'All things are an Exchange' for Fire, and Fire for all things, just as goods for gold and gold for goods.^b It did not help the paraphrasers that Heraclitus, unlike Anaximander, knew that he was using a metaphor and did so deliberately, perhaps they were unaware of this. Nor was there any help to be gained at this point by Heraclitus' direct description of the process. 'This ordered universe, the same for all, has been created by no one either god or man, but was always and is and shall be ever-living Fire, kindled in measure and quenched in measure.'^c To say that the process consisted of kindling and quenching was merely another way of saying that the substrate was Fire. They looked ahead, therefore, to the details of the cosmogony, and found there a process of Becoming that could be covered by the term Condensation, and so they used it. The blank was the more striking because he said that nobody did the quenching and kindling — it was, is and ever shall be by a fixed law.

Coming then to the details of the cosmogony, they found themselves able to summarize more clearly Heraclitus' views.^d Fire changes to the other three substances in much the same way as Anaximenes' Air had done. Fire condenses and becomes Water, Water condenses and becomes Earth, this is the Downward Path. Earth rarefies to Water, Water rarefies into Exhalations, some bright and akin to Fire, some dark and akin to moisture. The bright exhalations, collecting in places, form the stars, sun and moon, the dark, moist exhalations have the function (no doubt among others) of clogging and thickening the space above the earth, so that fiery bodies near the earth,

^a A1 §8^b B90^c B30^d A1 §§9, 10, A5¹ ἀνταμοιβή

such as the moon, shine less brightly than the more distant fire of the sun, which is out of their range. This is the Upward Path, the final stage of which is the complete return to Fire, which means the destruction of the particular universe

Two comments may be made on this: first, that the change from Fire direct to Water is startling. Perhaps Heraclitus was able to conceive it on the analogy of the quenching of fire by water. We have, however, a fragment which suggests his explanation: 'The changes of Fire are first of all, Sea; but of this Sea, half is Earth and half Fiery-Cloud'^a That is, Fire does directly become Water, but this Water is such that it holds combined in itself the more condensed form Earth with the more rarefied form Fiery-Cloud. Secondly, in this scheme the creation of the particular existences of our universe takes place on the Upward Path, after the bottom-most point of the Downward Path has been reached, and Sea and Earth have been created. The Fiery-Cloud, however, really belongs to the Upward Path, though it makes its appearance earlier, the Downward Path is simply Sea, Earth (Air is omitted), the Fiery-Cloud and the Exhalations are the effect of Fire on Water. Again we see that it is the Upward Path, the movement back to Fire, that interests Heraclitus, he gives to it the detailed work of the creation of the particular universe, no less than its destruction.

He deals with meteorological phenomena in a very arbitrary manner, if the summarizers report him correctly. The sun, moon and stars are portions of fire in bowls, and their eclipses and the phases of the moon are due to the turning of the outside of their bowls towards us^{b, b1}. The fire which forms them is due to the exhalations from earth and sea, of these there are two sorts, the bright and the dark, and the bright collect in the bowls.^c He does not explain the nature of the encircling dome (the summarizer complains) nor anything further about the bowls. Everything else is due to Exhalation. The bright exhalation burning in the sun-bowl makes day, the dark exhalation getting the upper hand makes night; similarly the

^a B31, A14

^b A1 §10, A12

^c A1 §9, A11, A12

^{b1} Perhaps this idea was based on observation of the crescent moon, which at his latitude can be seen lying horizontally like a boat, or bowl. He says (A1 §10) ἐκλείπειν τε ἡλιου καὶ σελήνης ἄνω στρεφόμενων τῶν σκαφῶν, 'when their bowls turn up', and cp A12 ὥστε τὸ μὲν κοίλον ἄνω γίνεσθαι, τὸ δὲ κυρτὸν κάτω πρὸς τὴν ἡμετέραν δύσιν. Aristotle uses, as well as σκαφοειδῆ, ὑπόκυρτον, which seems to mean 'curved underneath, like a bowl'

temporary superiority of the bright exhalation makes summer, the return of the moist dark exhalation makes winter, and so on. Night and day, the months, the seasons, rain and winds, are all due to Exhalation.^a It must be mentioned that this opposition of light and dark, as if Dark were a tangible thing, a form of moisture, is due to the influence of Pythagoras and his development of the Anaximandrian theory of Opposites.

The commentators attribute to Heraclitus also what had already been said by Anaximenes. that the reason why the stars give less light and heat than the sun and moon is that they are farther off.^b That he did say this is made probable by the existence of a phrase in his own words 'If there were no sun, it would be night so far as depends on the rest of the stars.'^c The moon is nearer the earth than the sun; but she passes through a less pure region, and so the sun, situated in a transparent, unadulterated quarter, is able to give more heat and light.^d There is also a hint of some 'commensurability'¹ in his distance from us, but this may be a transferred suggestion from Pythagoreanism

It is astonishing to find that Heraclitus, while realizing that distance decreases heating and lighting power, seems to ignore the fact that it decreases apparent size. The commentators attribute to him the opinion that 'the sun is the same size that he appears to be',^e basing this on his own words, that the sun's size is 'the breadth of a man's foot'.^f

It follows from the fact that the sun is a fiery exhalation, that he is 'not only new every day, but always continuously new',^g that is, the sun, being fire, exemplifies *par excellence* the Law of Flux. In him is also exemplified the Law of Justice, that is, of Measure and Fair Exchange, which runs through all the universe. 'The Sun will refuse to overstep his measure, if he does not, the Furies, the attendants of Right, will track him out.'^h The sun in his turn can be regarded as presiding over, as well as creating, the changes of the seasons to which all productivity is due. *he* watches these, and acts as umpire in defining their limits, so that to him too is entrusted the work of seeing that justice is done and measure observed.ⁱ Perhaps this accounts for the expression which Aristotle attributes to

^a A1 §§10, 11, cp. A14

^b A1 §10

^c B99

^d A1 §10, A12

^e A1 §7

^f B1

^g B6

^h B94

ⁱ B100

¹ συμμετρον ἄφ' ἑμῶν ἔχειν διάστημα (A1 §10)

Heracleitus about the sun: 'an intelligent kindling, made of (vapour) from the sea.'^a It is quite in keeping with Heraclitus' views about the nature of Fire and its connection with life and intelligence, soul and mind, that he should regard the great giver of heat to the earth, the sun, as having a life and intelligence of its own. At least it conforms to Measure, and creates it.

He had apparently nothing detailed to say about Earth.^b He discussed astronomical questions in some detail: we have an obscure fragment mentioning the Bear, as 'the limit of morning and evening', and saying that 'opposite the Bear is the boundary of Zeus Aithrios'^c.^{c1} This probably refers to Thales' discovery regarding the Little Bear, Heraclitus considered Thales to be the first astronomer.^d He does elsewhere, according to a scholiast, give the title *Astrologos*, which means Astronomer, to Homer;^e but the quotation which follows, if it was really that given by Heraclitus, would show that he meant 'astrologer'. This however was probably a late addition, it is impossible that Heraclitus could have used the word in any other meaning than that of 'astronomer'. His granting the title to Homer is an unexpected compliment, since elsewhere he blames him for ignorance.^f

When, governed by the law of Fate, our Cosmos is thus brought into being, the existing arrangement is maintained by the 'strife' or 'tension' of the Opposites.^g While particular things exist, they do so in virtue of the locking of the opposites in their strife.^h Thus there are two processes: there is the interlocking of the opposites at a certain stage in their contest, and the particular object so created continues in existence as long as this tension is maintained. This he likens to the tension of the bow and the lyre,ⁱ and speaks of it as a 'harmony'.^j There is also a pulling of the *whole* gradually in one direction: at the present stage, in the direction of Fire, to which all must

^a A12 ^b A1 §11 ^c B120 ^d B38 ^e B105 ^f B56, A22, cp B4²

^g A1 §7, A8 ^h A1 §8 ⁱ B51 ^j B8, B51

^{c1} Kranz (*Vors.* p. 177, n.) explains this as meaning that the North Star divides east and west, and opposite it is the zenith of the Sun (Zeus Aithrios), a boundary which he must not pass.

ⁱ¹ I take this as referring to the co-existence of opposites in the same object. The bow-string and lyre-string are alike in that, to be effective, they must have a certain tension, there is an unseen strife going on between the two ends or extremes. If either end 'wins', the bow- or lyre-string as such ceases to exist. See Guthrie, *Orpheus and Greek Religion*, pp. 229-30.

finally return. This movement is likened to the flowing of a river.^a A man can be said both to step and not-step into the same river,^b for as he steps in, fresh waters ever flow upon him.^c Or it can be expressed by saying that one cannot step twice into the same river.^d There is, in short, no fixed object called 'a river' for him to step into, there are only ever-flowing, ever-changing waters. So it is with us, and with the particular objects of our world: we are and are not,^e they also are never the same, but always changing, so that we can never lay hold of any definite thing because it changes as we touch it.^{f, i}

Thus there are two senses of the word 'existence'. there is existence as we know it, our articulated universe, perceptible to our senses and capable of maintaining our life. This is merely a necessary phase in a great cyclic process which goes on for ever. Existence in this sense depends upon strife — the tension of opposites, and therefore it can truly be said that 'Strife is necessary to existence',^g and that 'War is the father of all and the king of all'.^h It is, in fact, by a paradox, the producer of harmony, since the fairest harmony is made out of differing elements.ⁱ The strife of opposites means their coming together, and out of this, harmony is created,^j because there is a kind of balance or fair exchange preserved between them. One can therefore say, 'Right is Strife', and that 'War' is all-pervading and immanent in all things.^k There is also the existence of the Whole. there is the Eternal Fire, containing in itself the principle of change, according to a cycle fixed by Fate,^l and at the same time providing the substance with which the change works. Fire, the substrate, is also intelligent in some sense.^{m, m1} But when it gets the mastery — or to put it in another way, when on the Upward Path our universe draws towards the Fire to which it is returning — that will be the death of our particular Cosmos.ⁿ One can also call that Peace, and Stillness, as opposed to Strife and Movement.^o One can also call it a 'judgement', an ending of conflict. 'Fire having come upon all things, will judge and seize.'^p

Heraclitus, then, took up the problem of Change and

^a A1 §8

^b B49a

^c B12

^d B91, A6

^e B12

^f B91

^g B80

^h B51

ⁱ B8, B51, A10

^j B10

^k B80

^l A5, A8

^m B64

ⁿ B76

^o A1 §8, cp A6

^p B66

ⁱ¹ cp J E R McDonagh, *The Universe Through Medicine* (1940) p. 34. 'It is only the behaviour of activity which is observable, never the product itself.'

^{m1} τὰ δὲ πάντα διακίζει Κέραυνος. This is generally taken to mean the primal Fire

stated it in its extremest form 'Everything is on the move';^a ^{a1} that is, particular existence as we know it is on the move. Nothing, not even the most stable-seeming and solid substance, is really at rest. It has the double movement: the oscillation of the opposites within itself, and the movement of the Whole, either towards or away from the source. Such is 'existence', and such is 'change'. We cannot, then, *know* anything about particular objects, when we examine them, they dissolve into a part of the process of change. The more closely we look — and we have to look closely, for 'Nature loves to hide',^b — the more completely does this resolution into motion become apparent. The supposed clear-cut limits of things melt, and a quality changes into its opposite under our eyes ^c its nature comes and goes, that is, it possesses no nature, no essence that remains; and therefore nothing about which there can be knowledge. There is nothing, in any particular object, to know.

If, however, Heraclitus is to be counted a metaphysician and not a nihilist in philosophy, there must be something, some one unchanging reality to which he directs us. This cannot be, as it was for the Milesians, his material substrate, for Fire itself changes, and of its essential nature. It is actually no more at rest than the Cosmos born from it, for the process of change is perpetual.^d Aristotle even states that Heraclitus said that Fire too had once upon a time come into being.^e Is it then perhaps the eternal process of change that is the unchanging element in his system? This would not be of much help, for we should be confined to acknowledging this and then giving up all attempt at further investigation. Knowledge in any real sense would still be impossible, and obviously Heraclitus did not think this, as his own speculations prove. We should want to know also, what is the relation between the process of change, and Fire? Do they co-exist as material and force, and have we thus a duality? Or is the necessity to change one of the attributes of Fire, and are they aspects of the same thing?

Happily, if Heraclitus has stated the problem in its most paradoxical and startling form, he has stated the answer with equal force and insistence. It is as follows.

There is something, above both the process and the substrate, which unites them this is the Logos. He says: 'Wis-

^a A6 (Plato)

^b B123

^c B88, B91, B126

^d A10

^e A10

^{a1} πάντα χωρεῖ

dom is one — to understand the Reasoned Purpose which steers all things through all things,'^a and 'Not me, but the Logos. first listen to *that*, and agree that "All things are One" is Wisdom'^b

This Logos is not merely the process of change, it is the orderly process of change. The Everlasting Fire is kindled *in measure* and quenched *in measure*,^c and it is this Measure, by which the process and its material are ruled, that makes our world intelligible. This is the true One in Heraclitus' system, it is the only thing that persists in change, and it is present everywhere. It governs at the head, and works in every part and at every stage. When at the head, it is 'willing and unwilling to be called by the name of Zeus',^d that is, it is divine, and the true godhead, he speaks of it as 'that which never sets', and asks 'Who shall escape it?'^e Men in speaking of 'Zeus' are feebly aiming at a conception of it, but the personified deity they succeed in conceiving is not adequate. The Logos is not an arbitrary creator, but a Law, the source of all that is intelligible. It works in the primal fire, and arranges the order of the Upward and Downward Paths, and the 'measure' of their recurrent cycle,^f for they are 'one and the same'^g since the process is cyclical and endless.¹ In the creation of our Cosmos, it arranges the tension of the opposites, their harmony, their changes, it maintains the balance in every particular object, so long as that particular 'exists'. For instance, 'the sun will not overstep his measure',^h his oscillation, his orbit, is fixed for him within certain limits so long as he exists. The sea too 'is poured away and *measured* according to the same Logos as existed before Earth was'.ⁱ Law governs all creatures likewise. he speaks of them as 'driven to pasture by a blow',^{j, j'} as if Law for them were as actively cogent as the blow of the shepherd driving his flocks. It is also in ourselves, and by means of it we know, in so far as we acquire knowledge.

Heraclitus never speaks of this Logos as a material thing;

^a B41 ^b B50 ^c B30 ^d B32 ^e B16 ^f A8 ^g B60
^h B94 ⁱ B31 ^j B11

^{j'} πᾶν ἑρπετὸν πληγῇ νέμεται cp. Plato, *Critias* 109B (the gods drive us as a shepherd his flocks)

¹ To Heraclitus is attributed by Aetius the idea that the 'Great Year' or cycle was 10800 years (A13). He also is said to have reckoned a generation as 30 years, the shortest time in which a man could become a grandfather (A19). Thus the Great Year = 30 × 360, i.e. the cycle of the particular soul makes one day in the Great Year (see Burnet, *EGP*⁴, pp. 156-58).

when he describes it, it is as something knowable, that is, as a Law. He does not, however, separate it from his substrate Fire, he says 'the Thunderbolt steers all things', so that we can say, with Hippolytus, that the Fire is 'intelligent',^a that is, that Wisdom is a property of the Fire. But it is not 'in' the Fire in a material sense, it is the Law in the nature of the Fire, and the movements of the Fire are subject to it. The Logos is nowhere described as material in the way in which Empedocles' Love and Hate, or Anaxagoras' Mind, are described. It is this to which the paraphrasers refer when they speak of the process as being 'in accordance with Fate'. It is no use asking where the Logos comes from; it *is*, in the true sense, it is ultimate and fixed, and the highest wisdom is to know it. It is presupposed and pre-determined.

On this rests the whole of Heraclitus' epistemology. The senses are untrustworthy witnesses, though some are more trustworthy than others. The two chief are sight and hearing,^b sight is more accurate than hearing,^c but sight also is liable to error.^d Neither is any use 'if the soul be barbarian',^e that is, ignorant and untrained. Smell is more limited. 'If everything turned to smoke, the nose would discriminate'.^f He connected smell with breathing, and therefore with life. By this path we draw in sustenance from the surrounding life or fire, a vital heat which nourishes our own portion of life or fire; it is the one thing left to us in sleep,^g and it seems that 'souls smell in Hades'^h — that is, they draw in the savour of earthly exhalations, as the gods are supposed to draw in the savour of offerings. But the nose cannot, any more than the eyes or ears, pass judgements. The senses are 'paths'ⁱ or 'ways' by which we get our impressions of particulars, so that we are better off when awake than when asleep, because in sleep all but the path of breathing are closed, when awake, we peep out through our senses, as it were through postern-gates, but when we are asleep, our intellect is severed from its environment,^j and retains its connection merely by the breathing-function, which is likened to the soul's root in what surrounds it.^k Further, since our environment, like ourselves, contains a portion of the

^a B64^b B55^c B101a^d B46^e B107^f B7^g A16 §129^h B98ⁱ A16 §§ 129-30^j πόροι^k τὸ περίχον,

Logos,^a when awake we take in with our sense-impressions the Logos as well, and it is there if the Mind can recognize it; but when we are asleep we are cut off, except for breathing, so that we are cut off from the Logos as well. He likened the mind to a coal, which when brought near the fire, glows 'by exchange',¹ but when separated, grows dull. So too with the portion of Fire in ourselves: when separate, it is 'almost without intelligence',² but when connected by all its 'paths' to the surrounding world, it grows like the Whole, informed with Logos.^b Sleep is a kind of death in life, just as mortal life touches always on sleep.^c In waking, we share in a world common to all, in sleep, each turns to a separate world of his own,^d and this means illusion.^e We are still 'workers and fellow-workers in the happenings of the universe', but this goes on in spite of ourselves and without our knowledge.^f

The senses, therefore, are necessary to us in our search for wisdom, but they cannot give us anything more than fleeting impressions, the apprehension of the changing world around us. The Logos or Law that governs the change can be apprehended only by the mind. A seeker after wisdom must investigate many particular things,^g and for this he needs sense-perception, but this 'knowledge of many things' will not in itself give wisdom,^h only the co-ordinating soul can do that. Again, the individual soul can learn by looking into itself, he says, 'I searched into myself',ⁱ for the Law is there in part, and everybody has a share of the intelligence that can see it.^j But in itself and apart, it is nothing, it is of use only when it is an active part of the whole wisdom.^k

Wisdom, then, is something apart from particular impressions and particular opinions. It is one, and it follows that it must be known in its wholeness. It also follows that this is, strictly speaking, impossible for Man.^l The Logos itself, even

^a A16 § 127^b A16 § 130^c B26^d B89^e A16 § 134^f B75^g B35^h B40ⁱ B101^j B113, B116^k B2, cp. B114, A16 §§ 126, 7^l B78

¹ This cannot mean, as some summarizers (A1 §5) took it, that he 'learnt everything from himself'. He may have had no teacher, but he believed in objective study (B35) not in the mere contemplation of his own soul, nor in abstract reasoning as Parmenides did.

² In B116 (and in B112) Diels read φρονεῖν as in B113. Kranz returns to the MSS σωφρονεῖν.

¹ κατ' ἀλλοίωσιν² σχεδὸν ἀλογος

as it alone is knowable, is alone able to know in the fullest sense. All that we can do is to use the portion of the Logos — that is, our divine, non-mortal element — that is in us, in order to lay hold of the Logos as it is partially exhibited to us in our limited environment.^a

He constantly terms the Logos and the one Wisdom 'the Common Factor' ^{b, b1}. This means 'that of which a portion is in everything'. It has nothing to do with consensus of opinion. He speaks of human intelligence as 'common to all',^c that is, that of which every human being has a portion. Wisdom is there if we can grasp it; intelligence is ours to grasp it with, if we can use it. When he says that 'though the Logos is common, the majority live as if they had their own private wisdom',^d he does not mean, as the commentators (Sextus for instance) sometimes rather misleadingly express it, that only 'what seems to all' is true, and 'what seems to one isolated person' is false.^e On the contrary, 'the majority' are wrong, living as they do by the senses only;^f and 'to me, one man, if he be the best, is worth ten thousand'.^g Only the few are good, the majority are bad.^h Wisdom, though there for all to see, is not recognized;ⁱ nor is it easy, but demands that one search diligently and 'expect the unexpected',^j that is, faith is required, as well as industry, to make one persist in the hard search. The seeker after knowledge will be like one seeking gold: he will examine much and find little, but the little will be precious,^k the unseen Harmony is better than the visible,^l and Nature likes to hide.^m The discovery will always be one thing — the apprehension of the Logos. In this sense, Wisdom, though 'common', that is, immanent in all things, is also 'severed',^{n, n1} and apart: it is different in kind from any knowledge, opinion or perception, just as its object, the Logos, is different.

Men do not readily accept truth, though it is there to see, and in everything they encounter. The 'mob' stuff themselves like cattle,^o and care for nothing but to live and die, or rather rest, and procreate children who will live as they have lived, and die as they have died.^p Immortality — ever-flowing fame

^a A16 §131 ^b B2 ^c B11j ^d B2 ^e A16 §131 ^f B17, B19, B29, B72

^g B49 ^h B104 ⁱ B17, B72 ^j B18 ^k B22 ^l B54 ^m B12j

ⁿ B108 ^o B29 ^p B20

^{b1} τὸ ξυνόν

ⁿ¹ κεχωρισμένον

among men — which is the chief incentive of the best, means nothing to the common herd.^a They live like men asleep,^b on the side nearer death, not on the side nearer life. What of those who do care for Truth, or might do so? Those who can and ought to learn are very difficult to teach: they are slow of intelligence, both before they hear and when they hear for the first time, the truth about the Logos seems strange to them as if they had never encountered it,^c and they might as well be deaf or not present.^d They are also hindered by their incredulity,^e and by their clinging to tradition we must not be 'children of our parents'^f merely, if we want to learn. The latter attitude leads to a hostility to every new idea dogs bark at everything they do not recognize.^g Such people are also apt to prefer to the truth mere opinions, which are 'children's toys',^h and therefore to trust to false teachers, of which there are legion, of various kinds. They are willing to take as their teacher the mob and those who appeal to the mob; for they have no intelligence with which to distinguish the few good from the many bad.ⁱ

As for those who profess to teach there are first of all the poets. They are hopelessly astray they describe their impressions of our world, and leave out the main theme, the Logos, the Hidden Harmony, the Law of Opposites, and of existence through Strife. Homer, who was thought the wisest of the Greeks, was deceived, like the majority, by appearances.^j He did not know that Strife is essential, he uttered a prayer that it should perish from among mankind.^k Hesiod, learned though he was,^l and esteemed as a sage,^m did not understand the unity of Day and Night, else how could he have made Day the child of Night? They are one.ⁿ Archilochus did no better, they all deserve to be dismissed with ignominy,^o for offering mere short-sighted opinions instead of truth. It is a great mistake to use the poets and story-writers as evidence on matters not known, it is 'offering the untrustworthy as authorities on the uncertain',^p to quote Polybius' phrase, which is perhaps that of Heraclitus. A proof of the people's lack of intelligence is that they accept any popular bard as teacher and leader.^q

^a B29^g B97^b B1, B73^h B70^c B1, B17, B72ⁱ B104^j B56^a B57, cp B106^o B42^d B14^k A22^p A23^e B19, B86^l B40^q B104ⁱ B74^m B57

Then there are the religious teachers: they too are worthless,¹ and their rites are positively harmful,² when not merely foolish.³ They teach men to chatter to idols, to take part in obscenity, intemperance and unrestraint. The so-called Mysteries, the rites of Bacchants, Maenads, wizards and initiates, are unholy revelations.⁴ If the followers of Dionysus knew the Logos, they would know that their deity is another form of Death (Hades),⁵ for indulgence is death to the soul.⁶ They use the name of Dionysus to cloak what would otherwise be utterly shameful — the obscene phallic hymn.⁷ Purification likewise is a farce: they try to cleanse blood-guilt by defiling themselves with blood, as though a man were to wash himself by stepping into mud.^{8, 9} Prayer, when addressed to images, is like trying to hold conversation with a house,¹⁰ and anyhow, it is not good for men to get what they want.¹¹ Moreover, the religious teachers know nothing of what they profess to know — the next world, there await men after death such things as they do not dream of.¹² Clement tells us that Heracleitus threatens the followers of the various mysteries and Bacchanal rites with hell-fire!¹³

There was, however, one kind of supernatural manifestation of which Heracleitus approved: oracular responses. He speaks in the highest terms both of the Delphic Oracle¹ and of the Sibyl.² He believed, therefore, in prophecy, and that suitable instruments could be used by divine powers to make known the future.³ It seems likely that he regarded himself as a teacher of this kind, and found the oracular utterance best suited for what he wished to express. Respect for the Delphic Oracle became a tradition in philosophic thought, and it persisted at a time when belief in Delphi was waning, and attacks on it were becoming fierce. Socrates professed implicit trust in the god, though Euripides' *Ion* shows how far scepticism had gone by the end of the fifth century, and Plato still gives Delphi a place of honour in his *Republic*.

^a B15 ^b B5 ^c B14 ^d B15 ^e B77 ^f B15 ^g B5 ^h B5
ⁱ B110 ^j B27 ^k B14 ^l B92 ^m B93 ⁿ A20

⁸¹ Iamblichus quotes H. as saying that certain rites (probably Dionysiac) are means of healing and strengthening the soul (B68). This seems a misunderstanding of B15. Iamblichus also quotes H. as saying that sacrifice rarely comes from the completely purified (B69).

¹ Attempts to find an Orphic basis for the beliefs of Heracleitus have ended in failure. See Adam, *Religious Teachers of Greece*, pp. 237-9, and Guthrie on Macchioreo (*Orpheus and Greek Religion*, pp. 244-231).

Thirdly, there are the philosophic and scientific teachers. They may know a great deal, but they lack the one thing needful — the Logos — and so their knowledge does not attain to Wisdom. This is true of Pythagoras, Xenophanes and Hecataeus.^a They have missed the fact of the Tension of Opposites and their Harmony,^b Heracleitus has never, of those whose systems he has heard, found one man who has arrived at the truth that Wisdom is a thing 'apart' from everything.^c No one, however renowned, has attained to sure knowledge, their knowledge is mere 'opinion'.^d Justice will overtake those who manufacture and testify to what is false.^e We must not make random conjectures about things of the highest importance.^f Heracleitus has a rather grudging word of praise for Bias of Priene, one of the Seven Sages: he was 'better than the others'. Bias won this commendation apparently because of his saying 'The majority of men are bad', which Heracleitus quotes elsewhere.^g

There is one fragment which reads like a fierce attack on surgeons,^h but which, taken in its context, might imply that doctors in hurting do good. Heracleitus, however, evidently preferred to look at it the other way: that their remedies are as bad as the disease. He says, illustrating the thesis that all things are relative, 'Good and bad are the same: for example, physicians, when they cut, burn and torture the sick, demand a fee though they do not deserve it, for they are producing what is the same — benefit and ill'. The commentators show Heracleitus as definitely hostile to physicians, both by attributing to him letters enlarging on this point of view, and by attaching to him anecdotes in which he refuses medical aid.ⁱ

All these would-be teachers and leaders, therefore, fail because they have not the requisite grasp of the one wisdom, the truth. Heracleitus himself has found it, but can scarcely get anyone to listen to him. This claim, which was naturally taken by others as arrogance, was not really so, he abhorred conceit, which he likened to the frenzied disease of epilepsy,^j and was well aware that 'the wisest of mortals, when compared with God, will seem an ape in wisdom, beauty, and all other qualities'.^k Conceit means trusting in one's own par-

^a B40, B129^b B51^c B108^d B28^e B28^f B47^g B104, cp ch 10 (The Seven Sages) § 1^h B58ⁱ A12, A1 § 3^j B46^k B83, cp B82

ticular wisdom and knowledge as Pythagoras did, and that is an art of mischief.^a Heracleitus' wisdom is not his own, but 'that which is common', and it is not he who speaks but the Logos through him. One of his finest utterances was the famous 'Listen not to me but to the Logos. . . .'^b

'Wisdom is One.' This is the clue to all understanding, and once it has been grasped, the wise man will cleave to it; it is the mark of a fool to be excited at every new theory.^c The One Logos is sufficient, and can be applied throughout the whole of creation. At the head of things is Fire, always in motion, the motion being according to Measure. In its fiery form it is Life; and all down the scale of creation, that which approaches the fiery form is nearest to life. It has within itself the power of passing through a cycle of change, the downward and upward paths, in the course of which our particular world is produced. In the latter, the existence we perceive is a harmony of opposites. The movement of the Fire is imitated in every particular thing, which has its own strife and oscillation. The oscillation towards Fire is life in the absolute sense, the oscillation towards moist is death, but existence in the relative sense is due to the combination of the two in this state of balance within limits. Therefore a thing and its opposite are the same, only at different stages of oscillation. He runs through lists of opposites — day and night, winter and summer, war and peace, satiety and hunger,^d and says that God is all of these. Fire itself is 'need and satiety', according to whether it is articulating itself into a Cosmos or taking back creation into itself.^e Nomenclature is nothing: men call these things by what name they please, as objects change into one another in the same way that fire changes when it is mixed with incense.^f The bow, he puns, is called 'life', but it works death.^g The fuller's screw does two opposite kinds of movement at the same time: straight and crooked^h (that is, the spiral, up and round), showing that straight and crooked are 'the same'. The upward and downward paths are really one and the same:ⁱ they form a circle, and in the circumference of the circle end and beginning are merged.^j All the qualities

^a B129^b B50^c B87^d B67, cp B50, B57, B10, B88^e B65^f B67^g B48^h B59ⁱ B60^j B103^g 'Bow' = βίος, 'Life' = βίος

we give to things are relative only. good and bad, just and unjust, pure and impure. Sea-water is life-giving to fish, fatal to men.^a Pigs find pleasure in mud and dirt, a thing improper for a man.^b Birds bathe themselves in dust and ashes.^c To donkeys, straw is preferable to gold,^d oxen are happy when they find vetch to eat, but man needs something other than physical satisfaction to make up happiness.^e To the Godhead, everything is fair, good and just, it is only human beings who find some things wrong, others right.^f Beauty, pleasure, virtue, everything seen through mortal eyes has this relativity, the process of life and death, becoming and passing away, itself can be looked at in these two ways. For instance, the return to Fire is a return to Life, but it is death to particular existence. The coming from Fire is a receding from Life, but it means the creation of life for us and our world. One thing 'lives' the death of another. Fire 'lives' the death of Air, Air 'lives' the death of Fire, and so on,^g so that one can even say 'Life and Death are the same',^h the immortal mortal, and the mortal immortal,ⁱ as the everlasting cycle pursues its course, and one thing changes into another. Life becomes death, waking becomes sleeping, young becomes old,^j cold grows hot, hot grows cold, wet dries, and the parched is moistened.^k There is no dividing line between them, they change into one another, and that is destruction and creation. There is no other. The 'mortal is immortal, and the immortal mortal'.

The Whole and the Divided, the congruous and the not-congruous, the harmonious and the discordant these are pairs indissolubly linked, and a One is made up of all the parts, and all the parts come from a One.^l This being so, it follows that we can know them only in relation to one another. Pairs of opposites must be considered together, as one, we experience this in our sensations, when disease makes health pleasant, hunger satisfaction, and labour rest.^m So with all the pairs. the human race would not have known what the name 'Justice' meant, if there had been no evil with which to compare it.ⁿ All is a matter of relativity and comparison, the study of particulars is the study of ever-changing relationships, and the 'measure' in accordance with which they change. This is the Logos, the only wisdom; and its application to all that we

^a B61 ^b B13 ^c B37 ^d B9 ^e B4 ^f B102 ^g B62, B76, cp B77
^h B88 ⁱ B62 ^j B88 ^k B126 ^l B10 ^m B111 ⁿ B23

perceive is the only method that gives knowledge of any worth or significance.

Heracleitus explains the soul as an exhalation of Fire. Its genesis is part of the Upward Path. the body is produced on the Downward Path towards moisture, and the soul is 'exhaled', reaching up again towards the Fire from which it has come.^a The genesis of the human creature therefore is a replica of that of the Cosmos, and the soul's flow towards Fire is likened to the flowing river ^b (Plotinus quotes Heracleitus as saying that the Fire 'rests from change', and that it is laborious for it to toil for and be ruled by the same master;^c this describes its fate on entering into and while inhabiting the body) It is this reaching upward that makes the soul intelligent, it has its own Logos, which 'increases itself'.^d If the soul does not strive upward, it approaches moisture, and risks quenching. The chief cause of this is pleasure — self-indulgence. 'The dry soul is the wisest and best,'^e he says; and expressing this in terms of the metaphor of an exchange, 'It is hard to fight against desire, whatever it wishes, it buys at the price of soul' ^f No wonder that drunkenness has so deplorable an effect, it lowers the vital flame, soaking and quenching it, and we become foolish — helpless as one led by a child, and no longer able to conceal our folly ^g Wealth too is apt to bring out the worst in men, hence his prayer that the Ephesians might never lose their wealth ^h On this is probably based the anecdote about his object-lesson to the Ephesians on abstemiousness in time of war ⁱ

It is our duty, therefore, to be self-restrained in all things and to cultivate the vital, thinking part which we all share. Cultivating it means keeping in contact, so far as we can, with the universal Intelligence which surrounds us, and resisting pleasure, which is death. 'It is pleasure — or rather death — to souls to become wet' ^j We can and ought to examine ourselves and the Logos that is in us, ^k the Logos of the soul is so deep that we can never find out its limits, however hard we try, ^l as Heracleitus had done.^m We are not all endowed alike, this is implied in all his criticisms, and in the saying that 'character for a human being is destiny'.ⁿ But we all have

^a B12, A15 ^b B12 ^c B84a, b ^d B115 ^e B118 ^f B85
^g B117; B95, cp B71 ^h B125a ⁱ A3b ^j B77, B36 ^k B116, B115
^l B45 ^m B101 ⁿ B119

The influence of Heraclitus on all subsequent philosophy cannot be over-estimated. In metaphysics, he was the forerunner of the attempt to find the connection between the One and the Many, Reality and Change, he stressed Change, but pointed to unity in a reality that thinks and can be thought. In psychology, he laid the basis of an epistemology that set the mind up as judge over sense-impressions, and connected it with universal Mind. He distinguished between true knowledge and opinion. In ethics, he expounded an anti-hedonism which sought the best life in the use of intellect; he left pleasure and intellect opposed, and it was left for Plato and Aristotle to bring out the connection between the impulse to pleasure and the impulse to happiness, which led to the goal of Abstract Thought (*Theoria*). In politics, he stressed Law, and the connection between human and divine law. His contributions to scientific data seem to have been negligible, his real contribution to knowledge is his great hypothesis and its application. In this he resembles Plato, as also in his combination of artistic and intellectual gifts. Plato regarded him as the exponent of the theory 'All is change', and gave him no credit for having suggested a fundamental unity in the Logos. But this was because, to Plato, he stood in direct contrast to Parmenides.

HERACLEITUS FRAGMENTS CLASSIFIED AS FALSE OR DOUBTFUL IN DIELS

- 126a This is an example of mystical mathematics, believed to be derived from some Alexandrian Pythagorean *via* Poseidonius: the Number Seven is 'collected together', that is, found in a unity, in the Moon, and is 'dissevered', that is, found as separate units, in the constellations of the Bears, the meaning of this being that the moon has seven phases, and the Bears have seven stars. It is rejected on linguistic grounds as well as on its non-Heraclitean content.
- 126b This is a very doubtful restoration of an anonymous scholiast on Plato's *Theaetetus*, and appears to be concerned with flux and change. It refers to Epicharmus, who in his views on Change is said to have been following this quotation from an author whose name begins Hera—, the rest of the word is lost, and has been

restored to 'Heracleitus' This is probable, but the fragment is too mutilated to be of any value

- 127 'If gods, why lament them? If they be lamented, cease to regard them as gods' This saying is thrice quoted by Plutarch, who attributed it to Xenophanes, to whose thought it certainly belongs Heracleitus castigated certain religious rites, but not the anthropomorphic nature of the gods The authority is late and obscure
- 128 This is an inferior form of B5, sense and language are debased by the same late authority (Aristocritus) as in B127
- 129 This attack on Pythagoras, quoted by Diogenes Laertius, has been already discussed See p 75, note ^{a1}
- 130 'It is not fitting to be so comic that you yourself appear comic' (From a collection of Latin Christian proverbs) Diels compares this with Plato, *Sympos* 189b, where Aristophanes says 'Don't watch me! I'm afraid of what I'm about to say — not that it may be comic, but that it may be ridiculous' It is however possible that Plato was quoting a well-known *mot* without mentioning the author It is equally possible that the opposition of 'comic' and 'ridiculous' was proverbial and not invented by Heracleitus.
- 131 'Conceit is the hindrance of progress' (προκοπήνς ἔγκοπήν) This is a rather futile play on words, based on B46 The authority is late (collection of proverbs), and Stobaeus attributed the saying to Bion the Stoic
- 132-135 From collections of proverbs 132 is un-Heracleitean, 133 is a mere *cliché*, 134, 135 are Platonic
- 136 'Souls killed in battle are purer than those who die from disease' From a scholiast on Epictetus, based on B24 The sense is Heracleitean
- 137 εἰμαρμένα may be Heracleitean. cp 22A8
- 138 Epigram against Life attributed by Stobaeus to Poseidippus
- 139 An astrological forgery of the Byzantine era, based perhaps on B24

A doubtful fragment is B124, in which Theophrastus attributes to Heracleitus the words. 'The fairest universe is but a dust-heap scattered anyhow.' This is inconsistent with Heracleitus' views on ordered change, and sounds more like the expression of some Democritean or Epicurean Atomist.

B125, also from Theophrastus, is generally accepted with the insertion of μή 'The cheese-drink separates if it be [not] stirred.' This again seems more like the metaphor of an Atomist: to Heracleitus the Upward

and Downward Paths might be cyclic, but they were not equivalent to the Vortex. The phrase is, however, referred to as Heracleitean in the imitation by Lucian (see below, p. 131)

B52. This also suggests the inconsistent notion of a blind chance in the universe, as quoted by Hippolytus it reads 'Time is a child playing draughts. The kingship belongs to a child.' Lucian quotes this too in his imitation, but without the last phrase, and with the word 'dividing' added. The corresponding word is generally inserted, so that the whole reads. 'Time is a child playing draughts, bringing together, taking asunder'.¹ A few lines above he makes Heracleitus pity mankind because 'everything is mixed up in the cheese-drink going round and changing, in the sport of time'.

Heracleitus was not a glorifier of children. To him the child was as inferior to the adult as man is to the deity (B79). He compares a drunken man to one guided by a child (B117) that is to say, the Logos is quenched in him and he is left to the governance of folly. When Heracleitus told the Ephesians that they should hang themselves and delegate the city to boys, he meant that even boys could not do worse than they had done. He speaks of 'human opinions' as 'children's toys' (B70). This reduces to absurdity the suggestion of Macchiore (see Guthrie, *Orpheus and Greek Religion*, p. 228) that the words 'the kingship belongs to a child' may be an acceptance by Heracleitus of the Orphic story of the giving of the kingdom to the child Dionysus by his father Zeus. The fragment means, as Lucian takes it, that the cosmic game is being played by an immature, unintelligent Fate who moves the pieces at random. If therefore it is by Heracleitus (as seems likely) it was given a false stress by being lifted out of its context. Heracleitus' system, owing to the stress he laid on change, seemed even to Plato to offer little foothold for knowledge, and Heracleitus' insistence on the Logos was not sufficient to counteract an impression of unintelligibility, and so of random government of the universe, as is seen in Lucian's satire.

C IMITATION

- 1 The long extract quoted by Diels from the pseudo-Hippocratic writings has been taken too seriously by critics as a source of Heracleitean doctrine.² It is actually neither Hippocratic nor Heracleitean. It cannot have been written by anyone with a practising knowledge of medicine, and is the kind of writing based on unsupported theory that

¹ Hippolytus αἰὼν παῖς ἐστὶ παίζων, πεττεύων παιδὸς ἡ βασιληίῃ. Lucian τί γὰρ ὁ αἰὼν ἐστίν, — HP Παις παίζων, πεσσεύων (συμφερόμενος) διαφερόμενος.

² See Burnet EGP⁴, p. 150, and p. 145, notes. He makes the mistake of assuming a consolidated 'Heracleitean School' like that of the Eleatics, etc. This is disposed of by Plato, *Theaetetus* 179E sqq.

led Hippocrates to attack the influence of philosophy on medicine in his treatise *On Ancient Medicine*. It is the work of some rhetorical essayist of the sophistic school; and though containing imitation of Heracleitean doctrine, it is also embellished with phrases from the Eleatics, Empedocles, Anaxagoras and the Pythagoreans. The matter is worthless, the manner obscure, full of false analogy and verbal antitheses. It is not worth reading except as a curiosity of rhetorical writing.

- 2 This is an expanded version of the doctrine of Relativity applied to food. Food means that which has the power to feed, otherwise it is food in name only. In food and in medicine, goodness and badness are relative to the particular case. This idea, and the forcedly obscure style, are intended to be Heracleitean, the imitators do not seem to have noticed that Heracleitus does not use meaningless antitheses. His brevity is real, not faked. This is rather better than the preceding extract, but not by Hippocrates or any practising doctor.¹
- 3 Surviving fragments of a poem by Scythinus of Teos, a fourth-century poet who tried to put Heracleitus into iambic verse, as is mentioned by Diog. L. (22A1 16). The first fragment refers to the sun as a plectrum held by Apollo, an idea elsewhere attributed to Cleanthes. The second refers to Time: 'The last and first of all things, which has everything in itself and is and is not one. To-morrow is yesterday and yesterday to-morrow.' This was quoted by Stobaeus in prose, the version in Diels is a restoration into iambic verse by Wilamowitz.
- 4 Cleanthes, *Hymn to Zeus*. The whole universe obeys Zeus, who wields the 'two-edged fiery everlasting thunderbolt', and with this 'directs the Common Logos which traverses all things, mingling with the greater and smaller fires'. This adds nothing new, and empties out the original meaning by personification.
- 5 Lucian stages an interview between himself and Heracleitus, in which the latter laments man's fate because of 'the conflagration and the destruction of the Whole', and because 'Nothing is stable', and 'pleasure not-pleasure, knowledge not-knowledge, great small, up down, are the same, circulating and being exchanged in the sport of Time'. Time is a child playing draughts, men are mortal gods, gods are mortal men. The author accuses Heracleitus of riddling, like Apollo, and Heracleitus replies that he cares nothing for his fellows. The author suggests that if this is so no sensible man will buy his book, Heracleitus replies 'I bid all from boyhood lament, those who buy and those who don't buy'. The author's comment is 'This disease is not far removed from Melancholia.'

Lucian's clever satire represents the view of Heracleitus held by the average man.

¹ See W. H. S. Jones, *Hippocrates*, Vol. I (Loeb), Introd., pp. xxiv-xxvi.

The later history of Heraclitus' thought is best exhibited by Plato, who has several passages directly referring to those who professed Heraclitean views. Of these, the first and second given below are not in Diels *Vors.* The third, omitted in earlier editions, has been added in Edn. 5 (22A10)

1. *Theaetetus* 179E-180C. Theodorus is here made to complain that one cannot discuss Heraclitean doctrines with those at Ephesus who profess to be adepts, because none of them ever studies the argument, but 'pulls out some little enigmatic phrase from his quiver and shoots it off at you'. You will never get any further with any of them, nor do they with one another. They take good care never to let anything stand firm either in argument or in their own minds, thinking, I suppose, that that would mean a state of rest, which they are utterly at war with, and which they have banished to the best of their ability'. He denies that these are disciples forming a regular school: they 'spring up here and there on their own, wherever they happen to catch their inspiration'.

This passage is a brilliant parody of Heracliteanism as Plato saw it. These men are 'at war' with logical stability, and have banished it from their thought as Homer wished to banish strife from among men, a sentiment which earned him Heraclitus' censure. It is also a proof that no organized or recognized school of Heracliteans existed in Plato's time, but only individuals who copy his tricks of expression, and have no agreed basis of doctrine.

2. *Cratylus* 412D. Socrates, seeking Justice, discusses the primal Fire of the Heracliteans, which 'penetrating and burning through all things governs them'. When asked what this is, some tell you that it is the sun, another laughs this to scorn and asks (since this is the governor of the universe) if you think Justice ceases at sunset, he suggests Fire. Another says it is not Fire itself, but the heat in the fire.

This well illustrates the lack of agreement described in the *Theaetetus*.

3. *Sophist* 242E (22A10). Here the teachings of Heraclitus are referred to under the title of 'The Ionian Muse', and contrasted with those of Empedocles, 'The Sicilian Muse'.

23 EPICHRMUS

EPICHRMUS of SYRACUSE lived and worked at Syracuse under the tyrants Gelo^a and Hiero^b (485-467 B.C.). He is said to have survived to the age of ninety,^c or even longer.

His birthplace was variously given as Cos, Samos, Crastos in Sicily, Megara Hyblaea, Syracuse.^d He appears to have

^a A1

^b A5, A4

^c A3

^d A1, A3, A3a

worked first in Megara Hyblaea, and then to have migrated to Syracuse during the reign of Gelo, probably when Megara Hyblaea was destroyed by Gelo in 483 B.C.

For an examination of the value of the philosophical fragments, see the note at the end of this section.

Epicharmus, one of the originators of comedy, has no claim to be considered a philosopher. He is said to have attended Pythagorean lectures as an 'exoteric' student, though he did not join the inner fellowship, and to have expressed Pythagorean doctrines in his comedies, disguising them because of the tyranny of Hiero,^a but the surviving fragments of Epicharmus do not exhibit Pythagorean doctrine (the fragment quoted by Clement of Alexandria is clearly a very poor forgery),^b nor is there any reason to believe that the expression of philosophical views was dangerous under Hiero's régime. He is also said to have been at variance with Xenophanes, and two at least of the fragments appear to refer to Xenophanes' views,^c but such references do not constitute Epicharmus a philosopher.

Alcimus, a Sicilian rhetorician of about 300 B.C., wrote a book the object of which was to prove that Plato had borrowed from and even paraphrased Epicharmus,^d but the passages quoted in support of this thesis are either not relevant, that is, do not express Platonic views, or are forgeries.^e One passage, which may be genuine, refers to the Heracleitean doctrine of flux,^f and Plutarch says that it was from Epicharmus that the Sophists derived certain typical arguments based on the theory of change, such as that a man who has borrowed money in the past does not owe it in the present because he has become a different person meanwhile, and a guest invited yesterday to dinner is uninvited when he arrives to-day, for he has changed.^g This obviously points to a use of philosophical theories to produce a comic situation, as in the *Clouds*. Plato in the *Theaetetus* ranks Epicharmus with Homer as a poet who supports the theory that 'nothing is, but everything becomes'.^h This, coming from Plato, and in its context, means no more than that neither Homer nor Epicharmus had

^a A4, cp B65 ^b B56 ^c B5, B12 See earlier, pp 93, 94

^d B1-B6

^e B2 ^f B2 ^g A6

^h On this whole subject, see G Norwood, *Greek Comedy*, pp 87 sqq

thought the matter out. A scholiast, commenting on this passage, says that Epicharmus made comedy out of the doctrine of flux by bringing on the scene a man who repudiates a contract on the ground that he is no longer the person who made it, he is thrashed by the claimant, but when the latter is summoned, he in turn pleads that he is not the same man as the one who committed the assault.^a

Examination of the sources therefore shows that Epicharmus had no philosophical doctrine, Pythagorean or otherwise, to expound, but used the current interest in philosophical speculation along with other material for his comedies.

THE PHILOSOPHICAL FRAGMENTS ATTRIBUTED TO EPICHARMUS

All the fragments quoted in Diels are doubtful.

- 1 B1-B7. Alcimus, *Against Amyntas*. As explained above, this pamphlet was written to prove the absurd theory that Plato plagiarized from Epicharmus. All the quotations are doubtful, and Nos. 3, 6, and 7 almost certainly spurious.
- 2 B8-B46. Axiopistus, *Maxims* (noted as spurious by Athenaeus, A10), and B47-B54, the translation by Ennius based on this collection. This appears to be a collection of snippets made in the fourth century, purporting to be taken from Epicharmus' plays. Some of them by their form appear to be genuine (e.g. B10, B12, B13, where the force of expression seems Epicharmic, and B9, B29, B31, B37, where the dialogue form has been retained). Others (e.g. B19, B36, B37) have good authority (Xenophon, Aristotle), and in others the content goes back to the sixth and fifth centuries (e.g. B9, B12, B52. Xenophanes, B17, B48. Heracleitus, B53. Anaximenes), but the collection as a whole was known in antiquity to be spurious. It has been surmised that the book was prefaced by a passage (Diels, I, p. 193, Hübner Papyrus) explaining its usefulness in all circumstances, and boasting that the author Epicharmus, having been accused of inability to be brief, has hereby proved that he possesses this gift likewise.
- 3 B55. Axiopistus, *Canon*. A forgery by the same writer, of which nothing is known (A10).
4. B56, 57. Chrysogonus, *Republic*. Chrysogonus the Flute-player was a contemporary of Alcibiades (Athen. XII, 535), he wrote a feeble poem embodying Pythagorean and Heracleitean doctrines, and attributed it to Epicharmus.

^a B2, 22B126b

5. B59-B62 *Cheiron* A medical poem, probably a forgery of the later Pythagorean School.
- 6 B63 *Cookery* May be an extract from, or identical with, *Cheiron*
- 7 B64 *Epigram* Thought to be attributed to Epicharmus on account of B9
- 8 B65 *Antenor*. A book referred to by Plutarch, otherwise unknown.

24 ALCMAEON

ALCMAEON of CROTON was a young man in the old age of Pythagoras.^a that is, he was in his prime at the beginning of the fifth century B C

He wrote a book, a few sentences of which have survived, and dedicated it to three Pythagoreans, Brontinus, Leon and Bathyllus^b Some said that he was the first to write a book on Natural Science^c He attracted the attention of Plato and Aristotle, and his work on sense-perception was recorded by Theophrastus.

The school of medicine at Croton was the earliest in Greece, the *flourish* of Hippocrates being about 420 B C The former's most distinguished member was Alcmaeon, and to it belonged also the adventurous Democedes^d Alcmaeon may or may not have been a Pythagorean; Aristotle comments on the likeness of their opinions on the opposites, but does not profess to know who borrowed from whom^e There must have been mutual influence, more than that, we cannot say

Alcmaeon certainly did valuable service to philosophy. In medicine, which was his main interest, he did valuable research on the question most vital to the progress of epistemology and psychology — the nature of sense-perception, his work was the basis for that of Empedocles and Democritus He also made a generalization on the nature of health that was to have far-reaching influence He speculated on the usual questions of natural phenomena. From the little we know of his work, it seems to have been full of interesting observations and suggestions

One of his main principles was a theory of Opposites, described by Aristotle in the *Metaphysics*,^f and compared with

^a A₁ ^b B₁ ^c A₁, A₂ ^d See above, p 87 ^e A₁ ^f A₃

that of the Pythagoreans. Alcmaeon's words were: 'the majority of things human are two'^a He then named various pairs of opposites such as white-black, sweet-bitter, good-bad, great-small, throwing them out, as Aristotle says, at random, the Pythagorean school also believed in the opposites, but drew up a definite list of ten pairs.

It seems likely that the theory of opposites goes back to Pythagoras himself,^b that is, the bare theory that existence is made up of opposites. How far he worked it out we cannot say, but it seems likely that his followers worked out the idea definitely and numerically because their interests were philosophical, whereas Alcmaeon, taking the same idea, applied it to the make-up of the human organism, and that was why his list of opposites was more 'at random' than theirs. Their list of opposites was Limit-Unlimited, odd-even, one-many, right-left, male-female, rest-motion, light-darkness, good-bad, square-oblong, straight-curved, that is, it was an attempt to cover the whole of creation, and to give a list that should embrace the attributes of Space and bodies in space (number, shape, position, behaviour) and of human beings (physical and ethical attributes). But Alcmaeon, thinking in terms of the human body, gave a list of the many opposite qualities distinguished by the senses. Aristotle when blaming him for not limiting and defining them speaks from the metaphysical point of view, but Alcmaeon's criterion was not metaphysical, it was physiological. He was a physiologist fruitfully using a metaphysical idea.

This comes out clearly in the fragment which explains his view of health and disease: the essential of health is the 'equal rule' (*Isonomia*, the equality of democracy) of the functions¹ — moist-dry, cold-hot, bitter-sweet, and the rest, the dominance (*Monarchia*) of one or the other among these is the cause of disease.^c That is, the 'moving cause' is excess of heat or cold, and so on, the material cause is the superfluity or deficiency of nourishment, the parts affected in the body are the marrow, the blood and the brain. There are also external causes, such as environment, wounds and so forth. Health is the proportioned combination of qualities.^{d, d¹} This idea seems more

^a A₃, A₁

^b See above, p. 82

^c B₄

^d B₄

^{d¹} τὴν υγιάν τὴν συμμετρον τῶν ποιῶν κρᾶσις

¹ δυνάμεις

Heracleitean than Pythagorean; the opposites are connected by a harmony, not left as a duality.

His detailed work on the nature of the senses was based on experiment; tradition records that he was the first to 'dare to undertake the excision of an eye' ^a This clearly refers to a surgical operation on a human subject, and he profited by this opportunity, and doubtless also by dissection, to examine the eye and the brain

He said that hearing was due to the hollowness of the ears, in which the air echoes as in hollow vessels, ^b he seems to have thought that the ears drew in air, for Aristotle points out that the organ of hearing does not breathe. Alcmaeon was wrong in saying that goats breathe through their ears ^c. Smell is due to the drawing of the air in through the nose to the brain ^d The tongue distinguishes tastes, being warm, soft and wet, it melts them by its heat, and separates them according to their fineness and softness ^e — that is, density and texture. He had nothing to say about touch, ^f though his remarks on taste seem to border on reducing it in part to touch.

His most detailed work was done on the eye. He examined its structure by dissection: the eye itself is enclosed in certain transparent membranes, and it is connected with the brain by two 'light-bearing paths' which join behind the forehead. That these paths (the optic nerves) join, he showed by dissection, and supported his view by the observation that the eyes move together, not separately. The eye sees by the water and fire in it: the fire is a constituent of the eye — the eye when struck a blow sees light, the water comes from the brain. the paths bring 'natural moisture' from the brain to the eyeballs, and this carries back to the brain the fire or light which shines before the eyes. ^g

The seat of sensations is the brain. This contains the 'governing faculty', ^h and here all sensations are 'somehow fitted together'. The brain receives contributions from the ears, eyes, nose and the rest through the different paths; and therefore if the brain shifts from its position in the head, it is incapacitated, because it blocks up the paths. ⁱ This power of the brain to synthesize sensations makes it also the seat of thought: the storing up of perceptions gives memory and

^a A10^b A5, A6^c A7^d A5, A8^e A5, A9^f A5^g A5, A10^h A8, A11ⁱ A5^j A5

belief, and when these are stabilized, you get knowledge, as Socrates says in the *Phaedo*.^a This last idea is found in the treatise of Hippocrates on Epilepsy: 'for as long as the brain is in a state of rest (absence of movement), for just so long the man thinks'^b Whether this is to be attributed to Alcmaeon entire is not certain, it does not seem to accord very well with his views on the soul as being in everlasting motion; but he regarded the brain as the place where the sensations were received and arranged, and saw intelligence as something more than sensation, so Theophrastus says, contrasting him with Empedocles.^c On this view, he distinguished Man from the other animals, in that, as he himself said, 'he alone understands (συνίησι, 'puts-together'), whereas the other creatures have sense-perception without understanding'^d

This view of the importance of the brain led him to say in his investigations on the foetus that the head is the first part to be developed, but he admitted to knowing nothing definite about it, because one could not see what went on.^e He investigated the process of reproduction as far as possible, and held views on gestation^f and sex-determination.^g In studying gestation, he examined birds' eggs,^h a method which in recent times has yielded the most important results. He was of the school that believed the offspring to come from the female ovum, as opposed to those who thought it came from the male spermatozoon,ⁱ it was not until comparatively recent times that it was proved that the ovum and spermatozoon are two cells which coalesce to form the new cell of the embryo. In this connection he studied the cause of the sterility of mules.^j

A few remarks on natural phenomena are preserved, they are not important, and appear to be a reproduction of the views of the Ionians. He held Heraclitean views about the sun: it was flat, or in a bowl.^k He observed the movements of the planets.^l He believed that the heavenly bodies were everlasting, and had everlasting motion as a property.^m His belief about the human soul appears to be based on these astronomical observations rather than on his physiological researches, the connection is not clear. He is reported to have said that the soul was immortal because it is in everlasting motion, and

^a A11^b A11^c A5^d B1a^e A13^f A17^g A14^h A16ⁱ A13^j B3^k A4^l A4^m A12, A1

thus resembles the other everlasting things — the sun, moon, stars and whole heavens.^a This does not fit the view expressed by Socrates when he mentions Alcmaeon's theory that the brain is the seat of knowledge, knowledge being obtained from sense-perception when the latter is held stable by the brain. But there is no clue as to whether Alcmaeon connected the thinking-faculty with the soul, or how. It has been suggested¹ that when Alcmaeon speaks of a motion of the soul, he is referring to the mystical Pythagorean view put into the mouth of Timaeus by Plato, that the soul has circles revolving in it just as the heavens and the heavenly bodies do, and that this explains Alcmaeon's remark that the reason why men die is because they are unable to 'join the beginning to the end'.^b That is, Man, unlike the heavenly bodies, cannot achieve the full circle, the secret of perpetual motion.

Alcmaeon's importance lies in his beginning the physiological investigation of sense-perception, and thus laying the foundation of the physiological study of the organs of human knowledge. This was soon to become an important branch of epistemology: we cannot depend on our knowledge as objective, we must investigate the subject that knows. Alcmaeon himself did not believe in absolute and objective knowledge for Man, he held with Xenophanes that certain knowledge of things both imperceptible and mortal could be attained only by the gods, and human beings could offer only conjecture.^c On the other hand, he based such knowledge as we have on sense-perception, and did not sever the two as did the Eleatic School.

25 ICCUS

Iccus, a Pythagorean, was a gymnast and physician of Tarentum, whose abstemiousness became proverbial.

^a A12, A1

^b B2

^c B1

¹ Burnet, *EGP*⁴, p. 195. Burnet suggests that Alcmaeon was the author of this view, but it is more likely that he took it over from his Pythagorean friends.

26 PARON

PARON, a Pythagorean, was remembered solely for a *bon mot* uttered in reply to someone (perhaps Simonides) who said that Time was Wisdom. Paron replied that Time was Ignorance, because it makes us forget

27 AMEINIAS

AMEINIAS, a Pythagorean, 'poor but worthy', was one of the teachers of Parmenides ^a

28 PARMENIDES

PARMENIDES OF ELEA was in his prime about 475 B C

His *floruit* is placed by Diogenes Laertius in 504-501 B C ^b But he visited Athens and met Socrates when the latter was still very young, and he himself was about sixty-five years old; ^c so that if Socrates was about twenty, the meeting took place about 450 B C, making Parmenides' *floruit* 475 B C.

All commentary and tradition is based on Parmenides' own poem, which was still in existence, though rare, in the time of Simplicius, ^d a thousand years after it was written. Plato's dialogue *Parmenides* undoubtedly represents an actual meeting, but the views attributed therein to Parmenides cannot be regarded as the report of a conversation, they represent rather a criticism by Plato of his own theory from the Eleatic point of view, with which he was anxious to reconcile it.

He wrote his views in verse; this at first sight seems strange, because of the difficulty of the subject-matter, which does not seem to go easily into verse ^e It is unlikely that he was following the lead of Xenophanes, who apparently was by profession a bard. Plutarch suggests ^f that he among others used metre and the dignity of the epic style 'like a carriage', borrowing them from poetry in order to avoid the flatness of prose. This

^a 28A1^b A1 §23^c A5^d A21^e See A18 for Proclus' comment^f A15

implies that Parmenides thought his subject-matter lacking in interest, so that it needed the dressing of metre and metaphor to make it acceptable. The probability is rather that he used the epic form because it seemed to him the only worthy vehicle for a doctrine which he regarded as a divine revelation. He puts the initial revelation and the subsequent exposition into the mouth of a goddess, she welcomes him to the realm of light in the Prologue, and throughout the rest of the poem instructs him in the ways of truth and falsehood, addressing him directly and speaking of the doctrines he is not to accept as 'the opinions of mortals'. It is also possible that Parmenides believed the verse-form to be a good medium of instruction for minds younger and less mature than his own. For instance, his pupil Zeno, who was twenty-five years younger than himself, and became the official defender of his doctrine. It is not unnatural to suppose that he was trained by Parmenides to this end, and that the writing in metre was a device of the teacher to impress difficult and unfamiliar ideas. But it is the epic form, not the metre in itself, that is important, as expressing Parmenides' own attitude of reverence towards the truth, and his exaltation at his discovery of it, the metre followed as a matter of course.

The poem is divided into three parts. the Prologue, the Way of Truth, and the Way of Opinion. The relation of the Way of Opinion to the Way of Truth in Parmenides' thought was discussed even in antiquity. Did he mean any credence to be given to the Way of Opinion? The goddess instructing him says distinctly that it is false, a statement of the opinions of mortals, and bids him keep away from that sort of inquiry.^a Why then did he trouble to set it forth at such length, and depict the goddess as telling him to 'give ear to the deceptive ordering of my words'?^b 'In order', she tells him, 'that no mortal may surpass thee in knowledge.' That is, he is arming his hearer, as discovery of the truth has armed him, against the current body of doctrine, so that he may be able to refute it. If this be accepted, we have to agree that no part of the Way of Opinion is Parmenides' own belief, and pass on to the further question, whose belief is it? Burnet, by a process of elimination and by comparison with the later Pythagorean

^a B1, v. 30, B8, v. 50, B7, v. 2

^b B8, v. 5

doctrine, maintains that it is the Pythagorean system:^a Parmenides warns his hearer against two sets of false doctrine,^a the latter appears to be Heracleiteanism, the former is therefore Pythagoreanism, and we know that Parmenides had a Pythagorean teacher.^b This would further account for his having troubled to set it out in full, since Pythagorean teaching was at that time oral, and no authoritative written account was available.

However, Aristotle in the *Metaphysics*^c expresses the view that the Way of Truth represents Parmenides' conviction of the logical necessity, but that the Way of Opinion gives the result of his being compelled to accommodate himself to the visible universe, so that he offered on the one hand the logical One, on the other hand a dualistic explanation of the Many of sense-perception, deriving them from Hot-Cold. Thus Aristotle and other commentators attribute some of the views expressed in the Way of Opinion to Parmenides himself, and he gets credit for scientific discoveries such as that the morning and evening star are the same,^d and that the moon's light is derived from the sun,^e as well as for theories of sense-perception and knowledge.^f Simplicius, who wrote a careful commentary on the poem with many quotations, and who appears to have had the whole before him, took it in this sense not as absolutely false, but only as being the results of sense-perception as opposed to pure reason.^g

If it could be shown that any of the views in the Way of Opinion were new, this second explanation would have force, but of the 'discoveries' mentioned above, the first two are attributed also to Pythagoras, and the last has a marked resemblance to Alcmaeon, so that in the face of Parmenides' own words, we should have to dismiss Aristotle's view. But it gains support from Parmenides' own Prologue. There he explains how he was led to the gates of truth in a car driven by certain maidens, and these means of transport, according to the ingenious interpretation preserved by Sextus, are none other than the organs of sense. And though when he arrives he turns his back on these deceptive organs, yet there is no doubt that he came thus far by means of them. Therefore does he himself not admit that something is due to them? This some-

^a B6, vv. 3, 4 ^b A1 ^c A24 ^d A40a ^e A42 ^f A46 ^g A34, cp. A1 §22

¹ Burnet, *EGP*⁴, pp. 184-599

thing would be a description of the results obtained by relying on them — that is to say, opinions.

If, then, the Prologue is to be taken as representing Parmenides' own progress, the Way of Opinion is something more than an objective description of the views held by another school, and always disbelieved by him. It must be rather the best and most plausible scheme that could be erected by relying on sense-perception — its final word on the matter, — it must contain, not only Pythagoreanism — though that is doubtless the main ingredient, as it was in Parmenides' education — but the best-established of all the views held by earlier philosophers, as selected by Parmenides. That it was such an eclectic account seems likely from the few remains. For instance, there is a description of 'crowns' which appears to refer to the rings of Anaximander,^{a, a1} there is a polemic against 'ignorant people' who speak of a 'reversible path',^{b, b1} which seems to refer to Heraclitus and his followers, there were passages on sense-perception,^c on the physiological 'mixture' from which intelligence is derived,^{d, d1} and on sex-determination,^e which seem to refer to Alcmaeon and his school; and there occurs the word 'rooted-in-water',^{f, f1} which seems to refer to Thales. The main idea of the cosmology, the duality of fire, brightness, rarity, lightness of weight, and darkness, density, heaviness, appears to be Pythagorean, but the great mistake as Parmenides saw it, that of thinking that Not-Being could exist, was common to all his predecessors, and the structure reared on this assumption was contributed to by all of them.

Cornford,¹ however, believes that the two Ways from which the hearer is warned^g are not two systems of contemporary philosophy but two modes of thought. The Way of Not-Being, and the Way of Mortals, that is, the Way in which both Being and Not-Being are postulated. The former is utterly unthinkable, the latter, like Plato's *Doxa*, though not truth, has some claim to attention as accounting for the un-

^a B12, A37 ^b B6, vv 7-9 ^c A46 ^d B16 ^e B17, B18, A53, A54

^f B15a ^g B6

^{a1} Burnet EGP⁴, p 188, suggests that this is Anaximander's theory adopted by Pythagoras

^{b1} παλιντροπος κέλευθος

^{d1} κρᾶσις

^{f1} υδατόριζον

¹ F M Cornford, *Parmenides' Two Ways* *Classical Quarterly*, Vol XXVII, pp 97-111 (1933), cp A H Coxon, *The Philosophy of Parmenides*, *Classical Quarterly*, Vol XXVIII, pp 134-144 (1934)

deniable existence, for mortals, of a world of sense-perception. Parmenides, while denying the possibility of bridging the gulf between Logic and the material of sense-perception, nevertheless puts forward the account in the Way of Opinion as a second chapter, not the logical truth, nor yet an alternative scheme to be rejected, but a fable or plausible story, perhaps better than those of other thinkers who believed their fables to be true. It is therefore his own construction, as Aristotle thought, not a catalogue of erroneous theories.

If this is correct, then Parmenides' strictures on others who have offered their fables as an explanation of the visible universe are surely exaggerated: he says that helplessness guides the wandering thought in their breasts, so that they are borne along stupefied like men deaf and blind — uncritical herds, who hold that It Is and It Is Not are the same.^a This surely means that they are wrong in their whole endeavour, not merely in giving objective validity to their speculations. Heraclitus, Alcmaeon and Xenophanes had already expressed doubts as to the validity of the data of sense-perception; if Parmenides meant no more than this, he was falling into the same error as those he castigates in attempting to give a coherent account of phenomena. Again, Cornford's explanation makes it even less understandable why Parmenides should have troubled to write the Way of Opinion, to invent an account of a system which you know has no objective validity is merely to add to the body of false doctrine, whereas to record existing opinion does at least serve a purpose, that of arming the hearer against it. Parmenides differs from his predecessors in that he is not merely agnostic about the validity of sense-perception; he insists that it cannot give truth. Again, there was surely no need to warn his hearers expressly against believing that Not-Being Is as a way of thought, this was not a mode of thought adopted by anyone, and it was a danger not in itself, but only because it was *implied* in all previous systems, no person held or could hold it as a separate philosophy.¹ Again, Parmenides was surely (to adapt a phrase of Coxon's)^b 'too fine a thinker' to suggest that one fable

^a B6 ^b *Op cit*, p. 135

¹ i.e. at this date later, the extreme of nihilism was reached by Xenias of Corinth (ch. 81, p. 353 below), but he is post-Democritean. Others did not go so far: cp Metrodorus of Chios (ch. 70, pp. 327-9 below) and Gorgias (ch. 82, pp. 353-599 below).

could be 'better' than another in a realm where *no* standard of truth existed to make comparison possible. Again, if his pupils had understood him to mean that the explanation of the visible universe, though it could have no truth, was worth making, they would have followed this hint and continued this line of inquiry; but the work of Zeno was directed solely towards defending the doctrine of Pure Being, and they seem to have taken no interest in scientific research. Again, if Aristotle was right, and Parmenides made any concession whatsoever to the world of phenomena, why did his views seem so absurd to his contemporaries? Zeno's defence was against those who poked fun^{a, a1} at Parmenides, and he undertook to show that an acceptance of the Many produced results just as laughable as those derived from Parmenides' principle of the One. This proves that down to the time of Plato, nobody gave Parmenides any credit for having in any way accommodated himself to the visible world, they would not have found his results absurd if he had kept them to the realm of logic and had not insisted that they must be accepted against all the evidence of the senses. We are entitled to believe that the doubt as to Parmenides' meaning did not arise until the time of Aristotle, who was always hostile to abstract concepts that did not accord with experience, and who preferred to credit Parmenides with views more in harmony with his own; whereas Plato, whose interest lay in the abstract, was ready to accept Parmenides' views at their most uncompromising.

We cannot go so far as to say that Parmenides never believed in the doctrines he describes, he may at some time have believed in some of them. But certainly when he wrote his poem he absolutely rejected them. We can however think that the scheme he puts forward was such that he himself might have believed in it if he had not laid hold of the truth that made all such speculations null and void, and set for his mind that barrier which that one and only truth enjoined upon him not to pass — the absolute prohibition against believing in any of the results of sense-perception, and against using the methods of experience and experiment.

To sum up, on the one hand, the Way of Opinion is utterly false, not the views of Parmenides; but on the other hand, it

^a 29A12

^{a1} κωμωδεῖν

was such that had he accommodated himself to phenomena, he would have had to believe. This, while not assigning any of the views on sensibles to Parmenides, makes allowance for a Parmenidean arrangement of these rejected views, and gives them a broader meaning as representing the last word of sense-perception, an eclectic account of its contributions. The attack on the perceptions, then, is not a mere polemic against a particular school or schools, but a denial of the total results of this method. These results he sets before his pupil in all their completeness and plausibility, so that he may be fully armed against them.

Parmenides' own contribution must therefore be limited to the Prologue, and the Way of Truth

The Prologue,^a in an allegorical way, states his new method. Sextus says that the horses which bore him and set him on the 'famous road of the goddess' were the irrational impulses of his soul which drew him into the pursuit of philosophy. The means of transport were the senses: the car, the axle of which gave out a note like a pipe as its two wheels turned on each side, represents hearing, the wheels being the ears.¹ The Daughters of the Sun, who had left the halls of Night and who drove the car towards the light, pushing aside their veils, are, Sextus says, the eyes. The car reaches the 'gates of the paths of Day and Night', and Justice who guards them with twin keys. The maidens with gentle words tactfully persuade her to throw open the gates, a great opening is disclosed, and the car and its passengers go straight through. When they get inside, Parmenides is at once met and welcomed by the goddess.

It would be interesting to know what became of the car and the maidens, but we are not told. If they represent the senses and it is they who take him into the realm of certain knowledge, where do they leave him? How far does he acknowledge their aid? They are still there when the goddess speaks; she mentions the horses and the drivers. But after welcoming Parmenides (whom she addresses as 'Youth!'),^{b, b¹} showing that the revelation came to him early in life) and saying that it is 'no evil fate' which has brought him here to a place far beyond the journeyings of men, she tells him of the two ways, that of

^a B I ^b B I, v 6
^{b¹} ὦ κοῦρ'

Truth and that of Opinion. She forbids him to take the latter way. he is not to be forced into it by 'custom with its manifold experience, not to use the undiscerning eye, the echoing ear, or the tongue, but to judge by Reason (Logos), learning from her' ^a, ^{a1} The senses, then, seem to be used and then rejected in the light of a revelation coming from Mind, which is independent of them. Henceforth, everything is to be judged by this Mind; and its first command is to reject the material of sense-experience. This is the method, the gap in it is not discussed, apparently not realized, and it formed the problem for Parmenides' successors

Following this one path, then, we get the Way of Truth. The results which we arrive at are definite and logically worked out. The intellect is the criterion, and what it can think, exists, what it cannot think, does not exist. The mind cannot conceive Not-Being, therefore Not-Being does not exist ^b Being is the only possible object of thought.¹

If Being is, the consequences are that it does not come into being, does not pass away, is whole, and is motionless.^c

It does not come into being, because it alone exists, and if it came into being, it would have to come from somewhere. It cannot have come from Not-Being, for that is *ex hypothesi* unthinkable. And what necessity could there have been to cause it to come into being at one time rather than another? Therefore it is absolutely bound to be, utterly and now, there can be no 'beforehand' for what is, and no 'afterwards'. Therefore Becoming and Destruction (and with them Time itself) are done away with ('quenched') ^d

It is whole, and without parts and indivisible, because there is no 'more' or 'less' of it in one direction than in another, there is no Not-Being to prevent it from holding together (that is, to divide it into parts), for all is full of Being, and Being is in contact with Being. Thus it is whole and continuous ^e

^a B7

^b B2

^c B8, vv 3, 4

^d B8, vv 5-21

^e B8, vv 22-25

^{a1} These lines, quoted by Sextus as part of the Prologue and given in *Vors* edn 4 at the end of B1, are transferred in *Vors* edn 5 to B7

¹ Whether Being itself thinks and is intelligent depends on the interpretation of the line (B1) τὸ γὰρ αὐτὸ νοεῖν ἐστίν τε καὶ εἶναι. If we read ἐστίν, as apparently Clement who quotes it did, then Being is identified with thinking (so Diels). If we read ἔστιν as Burnet following Zeller does, then 'that which it is possible to think, and that which is, are identical', and the words mean that Being is the only object of thought, as Parmenides says in the negative form in B2 οὔτε γὰρ ἄν γινώσκῃς τὸ γε μὴ εἶναι (οὐ γὰρ ἀνυστόν) οὔτε φράσαις

It is motionless, for the same reason that it is without beginning and without end. It stays fixed in one place (since there is no Not-Being into which it can move) ^a

It is limited, or rather it is not without limit, ^{b, b1} for it lacks nothing. If it were without limit, it would be in need of everything. This surprising sentence, the paradox of the Parmenidean Being, is dismissed thus in two lines ^c. This attribute is not among those promised in the general statement with which the passage begins ^{d, d1}

Since Being is limited in form, it must have the shape of a sphere. It must be equidistant in all directions from its centre, for it cannot be 'more' or 'less' in any direction, since there is no Not-Being at any point to stop it from extending outwards equally in all directions ^e

This ends the Way of Truth

Such is the result of the logical method. The utmost has been done to present a Being robbed of all sensible qualities and functions. These qualities and functions, he says, Becoming and Passing-Away, Being and Not-Being, change of position, change of colour, are merely words, names given arbitrarily by men, ^f representing things not conceivable by the mind, and therefore not to be stated in words as if they were conceivable

The flaw in the system is quite clear to us. It lies just at the point which he hurries over: the assigning of a limit to Being. Aristotle goes over this point in the *Physics*:^g

The Whole is that which lacks nothing, for example, a whole man or a whole box, as with particulars, so with the general: it is that from which nothing is absent. That which has deficiency on the outside, that is, lacks shape, is not complete. A thing which is whole and perfect must be absolutely the same or very near it, but nothing is perfect which has not an end (*telos*), (that is, nothing can be the same unless it has reached a goal or limit of perfection). But an 'end' is a limit. Therefore Parmenides was more correct than Melissus in saying that the Whole was limited.

This fills out, though in Aristotelian language, the idea of Par-

^a B8, vv. 26-31

^b B8, v. 32

^c B8, vv. 32, 33

^d B8, vv. 3, 4

^e B8, vv. 42-49

^f B8, vv. 38-41

^g A27

^{b1} οὐκ ἀτέλευτητον

^{d1} ὡς ἀγίνητον ἓν καὶ ἀνώλεθρόν ἐστιν, ἔστι γὰρ οὐλομαλές τε καὶ ἀτρεμές ἡδ' ἀτέλεστον. ἀτέλεστον appears to refer to its being indestructible, that is, to repeat ἀνώλεθρον in the line above, unless we emend with Brandis to οὐδ' ἀτέλεστον and regard this as meaning the same as οὐκ ἀτέλευτητον.

menides, and we see that the answer was not that of Melissus — to take away the limit, and so make Being lacking in another way

Aristotle remarks that the Eleatics conceived of no existence other than the corporeal, yet realized that there must be an unchanging reality such as they describe if knowledge and thought are to be possible.^a They therefore denied the validity of sense-perception, and postulating a corporeal reality denuded of sensible qualities, arrived at a surd. The answer had to go much deeper, and still along Parmenidean lines. It required the still further denuding of Being of sensible qualities — the denial of its corporeality, the conception of Being as not extended in Space at all, the rejection of 'full space' as well as 'empty space', or as we say, the concept of non-material existence. Oneness and corporeality are seen to be incompatible, so that, as Burnet says, philosophy had either to cease to be monistic, or cease to be corporealist.^b It had to cease to be monistic, at any rate ostensibly, for a time, but this it could not do for long, since the whole search of metaphysics is for a One; and it could not do so at all except in appearance, for even in the theories of the pluralists who follow, the One can be traced as an implication or tendency. But Parmenides and his school had worked out the full results of the demand of reason, that Not-Being shall not be said to be, so that there was nothing to do but to go back to sense-experience and be materialistic. However, the challenge that all results thus obtained were merely Opinion not authorized by reason had now to be faced. Thinkers could not begin with an apologetic statement that nothing can be known for certain, and proceed to explain phenomena as Xenophanes and Alcmaeon had done. The nature of knowledge itself was soon to come up for analysis.

All that can be done with the Way of Opinion is on the one hand to treat it as the absolute opposite of all that Parmenides' axiom forced him to believe, the illusion against which he is fortifying his pupil, and on the other hand, to assign the different opinions to their probable origins, while watching closely for anything to which Parmenides himself seems particularly drawn. In the incomplete state of the poem, with the few fragments we possess, even with the supplement of the summarizers, neither of these methods can be carried out very

^a A25

^b EGP⁴, p. 180

fruitfully, they would be difficult even if we had the whole poem.

The scheme deals with the whole array of philosophical and scientific discovery. At the top stand the two First Causes: Fire, lightness, rarity, and Darkness, heaviness, density. These are equal in function and extent, and they are all that there is.^a Particulars come into being from their admixture. Explanations follow as to the nature and movement of the heavenly bodies,^b these are not preserved in detail, but we are told that there is a limited vault of heaven inside which the sun, moon and stars move.^c These First Causes appear to be Pythagorean. The heavenly bodies are explained by means of concentric 'wreaths', the narrowest filled with fire, and those surrounding them with night, and in the midst of these rushes fire, in the middle is the goddess who steers all things.^d This is supplemented by a passage in Aëtius,^e who says that some of the rings were of the rare element, others of the dense, and others mixed of light and darkness. There is a solid enclosure like a wall, and inside this a fiery wreath, in the centre of them all there is solid again, with a fiery wreath inside it. This gives the vault of heaven and the earth with central fire, a theory attributed to the Pythagoreans.^f The sun, moon and stars belong to the mixed rings. This seems to be Anaximander's theory of the wheel-like circles, possibly as adopted by Pythagoras.^g We find another Anaximandrian view in connection with the earth that it stays in the centre because it is equidistant from everything else, there being no reason why it should move in any direction.^h The moon shines with light borrowed from the sun.ⁱ The air is separated off or evaporated from the earth, the sun and the Milky Way are breathings from the fire, the moon is a mixture of air and fire.^j The sun and moon were separated off from the Milky Way, which owes its colour to its being a mixture of 'dense' and 'rare', the sun has broken off from the rarer portion which is hot, the moon from the denser which is cold.^k Here we seem to have some development of Anaximenes and Heraclitus. Hesperus and Phosphorus are the same. Pythagoras is credited by Parmenides with this discovery.^l The earth is rooted in water. This is Thales.^m These views are not

^a B₉^b B₁₀, B₁₁^c B₁₀^d B₁₂^e A₃₇^f A₄₄^g Burnet, EGP⁴, p. 188^h A₄₄ⁱ B₁₄, B₁₅, A₄₂^j A₃₇^k A₄₃, A_{43a}^l A_{40a}, A₁ §23^m B_{15a}

all consistent; Parmenides may have stated conflicting views for the benefit of his pupil.

Lastly come explanations of organic life — the origins of man ('from the Sun', or 'from slime'),^a ^{a1} sex-determination;^b the difference between the sexes, due to admixture of hot and cold, and subject to variations according to the direction taken by the spermatozoon.^c This was in contradiction to the view expressed by Alcmaeon, that the ovum was the essential factor.^d There are also theories of sense-perception, providing a physiological explanation of mind. Mind is the product of the mixing of qualities in the body.^e The mixing is of the hot and the cold, and when the hot preponderates, intelligence functions, and the more so, the better, because it knows its like. Perception and mind are thus identified. The more the cold preponderates, the less is perception. Still, apparently some perception is possible even then: the corpse cannot perceive light, heat and sound, but is aware of cold and silence.^f The reduced perception of sleep and old age is due to the advance of the cold element.^g The idea of a *crasis* or balanced mixture seems to be Alcmaeon's, but that intelligence depends on excess and not on a balance is contrary to his view, as Theophrastus points out (wrongly assigning these views to Parmenides himself) it is not explained what happens if there is equality of mixture, but only if there be excess of heat or cold.^h To Alcmaeon excess was disease. Here too we may have conflicting views expressed, or we may have theories in part like Alcmaeon's, that is, part of the current physiological explanations of sense-perception and knowledge, but differing from his in detail, perhaps opposed to his, like the theory of sex-determination, and that of sight.ⁱ

In this connection we find also the theory of the reproductive Eros,^j which is prominent in Empedocles, and is now coming into philosophy from mythology (Hesiod). Elsewhere is the statement that the goddess who is in the middle of the concentric circles brings male and female together.^k If she is Hestia, the central fire,^l has she any connection with Eros, or have we here again conflicting views? It is impossible to say. She is

^a A1 §22 ^b B17, B18, A53 ^c A52, A54 ^d 24A13 ^e B16 ^f A46

^g A46a, b ^h A46 ⁱ A47, A48 ^j B13 ^k B12 ^l A44

^{a1} Diog. L. The MSS read εἰς ἥλιου, but in Frobenius' edn this was emended to εἰς λαός, and a modern scholar (Ziegler) has suggested εἰς πηλοῦ

'the deity who steers all things';^a this, in the language of philosophical symbolism, is the Law of Fate, or necessity,^b which is the ultimate cause of all creation, and Eros, her first product,^c is the original impulse of attraction of like to unlike, made prominent in the system of Empedocles.

Such, then, were the opinions and inquiries from which the pupil was to restrain his mind. The Way of Opinion shows that Parmenides was conversant with all philosophical and scientific doctrine. The mistake of attributing these various opinions to himself led commentators to describe him as the pupil not only of the Pythagorean Ameinias,^d but also of Anaximander (according to Theophrastus) and of Xenophanes,^e and as having taught Anaximenes.^f Some claimed that though he 'heard' Xenophanes, it was not Xenophanes but Ameinias who set him on the philosophic path.^g The probability is that he pursued knowledge in the usual 'empirical' way, and believed much of what he heard, until his great inspiration about the One became dominant; this process may have been hastened by his meeting with Xenophanes.

Whatever may be thought of the purpose of Plato's *Parmenides*, one thing stands out clearly. the deep and genuine admiration that Plato held for the uncompromising defender of the One as the unchanging object of knowledge against the advocates of the Many of sense-perception. His tributes in the *Theaetetus*^h and the *Sophist*ⁱ are not qualified by the tinge of irony usual to him, and even if it be true, as Taylor suggests,^j that the latter part of the *Parmenides* is a *jeu d'esprit* designed to show that Eleatic methods such as Zeno's could wreck the Eleatic no less than the Platonic theory of reality, yet nevertheless Plato in his efforts to reconcile the demands of logic with those of sense-perception never for one moment forgot the Parmenidean *desiderata*. Plato gives one the impression that, like Parmenides, he would rather have sacrificed the sense-perceptions to intellect than the reverse, if he had had to choose between them, and that he respected the Eleatic point of view in a way which placed its founder outside the range of the irony and even scorn with which he visited, for instance, the followers of Heracleitus and Empedocles.

^a B12, v 3 ^b B8, v 30, A37 ^c B13 ^d A1 §21, cp A4 ^e A1 §21, A2

^f A3 ^g A1 §21 ^h 183E ⁱ 217C (both in Diels A5)

^j A. E. Taylor, *The Parmenides of Plato*, Introduction

29 ZENO

ZENO of ELEA was in his prime about 450 B C

The tradition conveying his thought, though incomplete on some points, is particularly clear, not only because his own writings existed, but because Aristotle dealt at some length with the problems he raised, and all later commentators take their matter from Aristotle

Zeno was undoubtedly a pupil of Parmenides. We have it on Plato's authority that they visited Athens together when Zeno was about forty years of age, and Socrates still very young,^a so that if we assume Socrates to have been about twenty, this places the visit, and Zeno's prime of life, in about 450 B C. They stayed at the house of Pythodorus in the Cera-meicus quarter outside the city wall, and there Zeno gave readings from his book to the many who came to hear.^b He made an impression by his handsome presence as well as by his writings. His death was notable: he formed a plot against the tyrant Nearchus of Elea, but was discovered, and subjected to torture; he refused to reveal the names of his fellow-conspirators, and died indomitable.^c Many anecdotes were based on this event, exemplifying his cleverness and courage. Some say he 'revealed' the names of the tyrant's own friends as the conspirators. The favourite story was that rather than betray his friends, he bit out his tongue and spat it at the tyrant. Another story granted him revenge by making him bite off the tyrant's ear or even nose.^d

Plato makes him say that the book which he read aloud to the Athenian company was written when he was young and contentious, and published without his consent, it was a defence of Parmenides' theory of Being.^e It had a new method: instead of attempting a direct refutation of the opponents' position, Zeno undertook to show that if their postulate, the existence of the many with all its implications, be accepted, the results which follow logically can be ridiculed more easily than Parmenides' position.^f Zeno worked out forty of these deductions; they are given a special name, *Epicheirêmata*, 'Attacks';

^a A11^b A11, A13^c A1 §26^d A1 §27, A6, A7, A8, A9^e A12^f A12, cp A23

one may call them *reductiones ad absurdum*. This piece of work earned for him from Aristotle the title of founder of dialectic.^a It appears to be a mistake to suppose that they were written in dialogue form, Aristotle speaks in one passage of 'the answerer and Zeno the questioner',^b but elsewhere is quoted as giving another name (Alexamenos) as the first writer of dialogues, in contradiction to those who said it was Zeno.^c Nothing in the reports of his opinions, or in the quotations from his book, supports the view that they were in dialogue form, rather they seem to be in the form of a set of logical deductions from a given premise. Burnet plausibly suggests that the 'Zeno the questioner' of Aristotle's paragraph is a personage from a dialogue written by someone else.^d

This special kind of criticism seems to have been Zeno's only work, no trace of a positive theory can be found in him, except a few jumbled cosmological remarks in Diogenes Laertius which might belong to anyone.^e The theory behind his initial attempts must have been that of Parmenides, but some of his destructive reasonings seem to apply equally to Parmenidean conclusions. Whether this was because his criticism extended, leaving him to abandon the assumptions which he began by supporting, or whether he was not aware of this development and remained always in his own view a disciple of Parmenides, is difficult to determine. At any rate, his original contribution was his method, by which paradoxes were brought to light and posed ready for future thinkers, he did not formulate any constructive scheme. His main attack was certainly directed against pluralism in general, and certain Pythagorean concepts in particular.

His method, then, is to take his opponents' postulate and work out from it a pair of contradictory conclusions.

First he takes the assumption *that things are a many*. We have one *reductio* of this proposition quoted in full by Simplicius.^f The contradictory conclusions are that they must be (1) finite, (2) infinite in number.

(1) 'If things are a Many, they must be the number they are, neither more nor less. If they are the number they are, they will be finite in number.'

(2) 'If things are a Many, then they are infinite in number; for there are always other things in between them, and again

^a A1 §25, A10 ^b A14 ^c A14 ^d EGP⁴, p. 312 ^e A1 §29 ^f B1

others between those; and thus they are infinite in number.' This latter half was called by Aristotle the argument from dichotomy

Another *reductio* based on the same hypothesis, *that things are a Many*, undertook to show another pair of contradictory conclusions, that things must be (1) infinitely small, (2) infinitely great^a

'If things are a many, they must be a number of units. These units may be either with magnitude, or without magnitude

(1) If they are without magnitude (that is, without size, thickness or bulk) then such a unit if added to any other thing will not make it larger. For nothing can gain in magnitude by the addition of that which has no magnitude. And so it follows at once that that which was added was nothing . . . (Here probably followed a similar statement about subtraction.) So that if the object is not decreased by the subtraction of the unit, it is clear that the thing added was nothing, and the thing subtracted was nothing^b. That is, everything is infinitely small, so small as to have no magnitude.

(2) If the many things are units with magnitude, that is, if the unit is something (having size and thickness) then it must have a definite size and thickness, and each part of it must be a definite distance from each other part. And if you take one such part, the same argument applies. It will have a definite size, and therefore parts, and each part will be a certain distance from each other part. And so on *ad infinitum*, by the argument from dichotomy, by which things are infinitely divisible. There can never be a subdivision so small that it cannot be redivided, that is, so small that it will not have a "one part" and "another part",^{c, c'} whose relations to each other can be stated in terms of the distance between them. Thus you get an infinite number of things each having magnitude, and this infinite number of magnitudes added together make up infinite sizes. Thus things are infinitely great^d.

Some commentators were puzzled as to whether it was the One or the Many that Zeno was attacking in this argument. The answer seems to be that he was attacking the Many as such, but that he was not attacking the One as such; he was attacking the One regarded as something from which the Many

^a B₂, B₁

^b B₂

^c B₁ (p. 255, l. 20)

^d B₁

^{c'} ἕτερον πρὸς ἕτερον

could be derived, and the concepts of the One necessary to make this possible. These concepts of the One appear to be Pythagorean: that is, the concept of the One as a unit, and the assumption that there are *many* of these units, by the addition together of which things are made. If you take as your unit the indivisible (*atomon*) in order to have something ultimate, then you are starting with something that is really nothing, for if it is indivisible it has no size, extension, bulk, and therefore by adding together such units, since they are 'nothing' the result you obtain is 'nothing'. You cannot get 'size' by adding together things that have no size, even if you take an infinity of them. If however you take as your unit a *something*, then that something has size, and is therefore infinitely divisible, so that you start with something of infinite magnitude already, and by adding together such units you can get nothing but infinite quantities, you cannot get *definite* size. So that in either case the introduction of the idea that there are many such units is useless, you really get nothing from multiplication but what you started with. If you start with zero, you get zero, if you start with infinity, you get infinity. You are not helped by setting an arbitrary limit to your number of units, your multiplier may be a definite number, but still you do not get a definite size as your answer, zero and infinity, whatever they are multiplied with, give zero and infinity.

Now Zeno's attack was on the idea of the Many, that is, of multiplication, and we see from the above that multiplication in itself is useless. One can put it equally well by saying that addition is useless, for multiplication is addition. It is useless because you are bound to start with either a Nothing or an Infinite, and by its means you get only what you start with, either a Nothing or an Infinite. The question is, did he realize that the difficulty is not solved by the rejection of the concept of multiplication? Or was he satisfied with reducing to absurdity the Pythagorean view that by the addition or multiplication of units you can get the Many of the universe, with their finite shapes, sizes, quantities, measurements? And did he then, having shown the uselessness of multiplication, rest satisfied with the Parmenidean One, which simply exists, and has no Many, no multiplication, in it? Did he not apply his theory of dichotomy to the Parmenidean Being, which was susceptible to it, since it had size and extension?

There is one statement, quoted in a Peripatetic essay, that might be thought to be a defence of the Parmenidean Being:^a 'According to Zeno's argument, there must be a magnitude which is without parts (that is, indivisible) because it is impossible to traverse an infinite number of positions in succession in a finite time, a thing which has parts has a half, and the moving body must necessarily reach the half-way first,' and so on. It would always get to the half, and never to the end. Therefore if it is to get to the end, there must be a magnitude that is indivisible. But this is part of Zeno's arguments on motion, and he is proving the Parmenidean thesis that motion is impossible; he takes the hypothesis *that there is motion*, and undertakes to show its contradictions. The statement that there is a magnitude that is without parts is therefore merely one of the contradictory conclusions based on this hypothesis, and not what Zeno is setting out to prove. That is to say, it is not a defence of the Parmenidean Being. We cannot therefore use this passage as evidence that he remitted his thorough-going law of dichotomy in Parmenides' favour.

Moreover, there is one statement which if authentic shows that he did reach a position of agnosticism about Being. Eudemus says ^b 'They say that Zeno said that if anyone would give him an account of the exact nature of the One, he would be able to describe the Many.' And Seneca saw this when he said,^c 'If I am to accept Parmenides, there is nothing except the One, if Zeno, that there is no One, even.' Thus Zeno reached a position of nihilism as complete as and more rigidly maintained than that of the Sophists.

The trouble, indeed, lies not in the multiplication of the Unit, but in the Unit itself. The One, conceived as having extent, even if it be postulated as for ever One, is really a Many, the law of dichotomy pulverizes it, and to infinity. Yet if the One has no extent, what is it? Nothing, Zeno says,^d he plainly does not conceive of any existence other than corporeal. We have to supplement, 'Nothing corporeal'. He will then ask us, how can anything corporeal come out of it? We then have two ways open to us: we can say, 'It does not', and rank ourselves with those who insist that all perception is illusion, thereby giving up all right to seek for or offer any contribution to knowledge, or we can say 'It does', and when we are asked

^a A22^b A16^c A21 *ad fin*^d A21

'How?', refer the questioner to Plato and the theory of Participation. But it is probable that to Zeno this would have seemed a mere metaphor and an evasion.

We have spoken throughout of the Unit, and not of the Point, because Zeno's attacks clearly refer to Being, and because he does not himself mention, in the fragments we have, the Point. Aristotle and others, however, saw that the Being or Unit that he was attacking was actually the Point,^a and in his arguments we see that he is thinking of points and lines. The Point which 'is something', that is, has magnitude, and from which things are made up by addition, is the Pythagorean point, which is a spatial unit, and has extension in space.^b The Point which has no extension and is therefore 'nothing', is no doubt a mathematical concept which was at that time being suggested as a way out of the difficulty posed by dichotomy, by those who saw it. The first way out of a difficulty of this kind, that is, when your hypothesis leads you to a contradictory conclusion, is to take the opposite hypothesis, just as Melissus thought to get rid of the contradiction in Parmenides' Being by removing what seemed to be the cause of the trouble, that Being is Finite, and supplying the opposite, that Being is Infinite. Similarly there were some who said that the Point had no magnitude. Zeno's answer was, then how do you get a line from it? If the point is zero, what mathematical device is going to give you from it a line of x inches long? It has been said that Zeno's greatest title to remembrance is that he was the first to grasp clearly the mathematical view of the point as position without magnitude. But this seems to give him too much credit. His attitude was not as positive as that. He never said 'a point is that which has no magnitude'. Rather, he showed that *if* it has no magnitude, you are reduced to an *aporia* if you try to account for existence by means of it. And he certainly did not say that it was position without magnitude, when he deals with the point as position, as in his arguments on motion, he speaks of Pythagorean points, which have not only extension but bulk, and calls them 'bulks',^c where we have to think of a moving point tracing a line.

'A point is that which has position but no magnitude'. Herein lies the answer to one of his puzzles. He says that that

^a A21

^b 58B9, 58B10, 58B38

^c A28

^{c1} δγκαι

which has no magnitude is nothing, we say that it is something in virtue of having, not magnitude but position. What does 'position' mean? It is a relative concept, meaning distance, measurable and finite distance, from some other thing or things. All that can be said about a point is its distance from, that is, its relation to, something else. The straight line is the shortest distance between two points. Hence there are an infinite number of positions, that is, possible distances between one extremity and the other, but not an infinite number of lengths added together. Point A exists only in so far as it has a relation to Point B, B being any other fixed point. It is not a thing in itself, but only one term in a relation. Hence the line is not made up from the point, to speak of a point implies the existence of a line, and so on. Making up lines from points, and reducing lines to points, is not dealing in two kinds of existence, one absolute and one particular; both are particular and interdependent existences, and are meaningless apart from each other. There is nothing absolute about the point, and so though it is not zero, it is not ultimate Being either. You can take the point and derive the line from it, but what you have done is to state one particular in terms of another, not to derive the particular from the universal, and though you have got your particular, you have no more than what you started with, for you started with that which was finite and relative in virtue of its having position. Given something finite and relative, you can always derive other finites and relatives from it, but the difficulty is to find a true absolute and derive relatives from that. Neither the Pythagorean point, nor the true mathematical point, will do, Zeno saw this, but he did not see that the reason why the latter will not do is not because it is 'nothing' (corporeal), but because it is 'something' (particular and relative).

Such then were the results he obtained by applying his method to the concept of the Many. He devised similar arguments on the implications of multiplicity — space, motion, sound.

The *Epicheirêma* on Space was as follows.

Everything is in Space. By this we must mean that it is in something. But if Space is something, then Space itself is in something, and so on *ad infinitum*.^a

The opposite half of this *Epicheiréma*, that Space is nothing, is not given, no doubt as being obviously absurd — the proposition 'Everything is in nothing' being meaningless

The answer to this dilemma was seen clearly by the commentators Eudemus comments that Zeno is using the term 'space' (τόπος) in the sense of 'place' (τὸ ποῦ), and the 'place' of a body is simply the limit of the body (πέρας) ^a That is to say, just as we saw that 'position' is not a thing in itself, and yet is something, that is, one term in a relation, so too 'place' is not a thing in itself, nor is it nothing, but it is a relative term, a property of the body which is said, by a confusion of language, to occupy the space. The body is not 'in' the space as one box is in another, the space is the outer boundary of the body, and nothing can be said of it that is not relative to that body Aristotle tackles the problem in the same way, but shows a different aspect.^b if you say that a space A is in a space B, you do not mean that space A is in the same space as space B You are bringing in a new term, space B, and saying that space A is in space B That is to say, space A *per se* can be expressed only in relation to the solid of which it is the plane boundary, it has no existence of its own, no existence except as being the enclosure of the solid. You can say therefore that the solid is in space A, but not that space A is in anything *per se*. If you want to say that space A is in something, you have to bring in this something as a new term space B, and then A can be expressed as having a relation to space B But space B is *ex hypothesi* bound to be different from space A, and not the same space Thus, to say that space A is 'in' something in Zeno's sense is meaningless Space A is neither 'nothing', nor 'something in itself', but only 'something' in relation to that of which it is the boundary This is probably an argument against the Pythagorean Void, as having existence in itself, and against the whole Pythagorean concept of Space as something which goes into the making of particulars. But as in the case of the Unit, it directs the attention to the nature of Space itself, and pushes the inquiry onwards towards the view that Space is merely an attribute of body, the two terms being correlates. Since their existence is relative and interdependent, you cannot make one out of the other. You can only express either in terms of the other Eudemus also comments on the possibility of non-

^a A24^b A24

spatial existence, by naming existences which cannot be expressed in terms of space, but are, as we say, 'abstract', such as Health, Courage and the like.^a

The arguments on Motion, Aristotle tells us, were four.^b

The first dealt with the impossibility of traversing a given length. (All four problems deal with motion in a straight line, from point to point.) You cannot traverse a given length, because your length is divisible into two, and you must reach the half-way position before you reach the end, thus you are left with another length, also divisible into two, and must reach the half of that first, and so on *ad infinitum*. The line is infinitely divisible into two, so that you go on infinitely traversing halves and never reach the other extremity of the line.

This is another application of dichotomy, the infinite divisibility of the line. The answer is usually expressed by saying that there is a difference between infinite divisibility and infinite length, or any other quantity. Any finite length is infinitely divisible by any factor, but it does not cease to be finite. As Gomperz says,¹ mathematicians assure us that the infinite series $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} \dots$ actually reaches the finite quantity 1, though it does not exceed it. Similarly $\frac{1}{10} + \frac{1}{100} + \frac{1}{1000} \dots$ reaches, though it does not exceed, the finite quantity $\frac{1}{9}$, and the general formula $\frac{1}{n} + \frac{1}{n^2} + \frac{1}{n^3} + \frac{1}{n^4} \dots$. ∞ = the finite quantity $\frac{1}{n-1}$ is true.

This relation between infinity and finitude is surprising, put in that way. But here again the real crux of the matter is the nature of motion. Motion, like the point and the place, is not a something-in-itself, it has no existence except as a term in a relation. When we say a thing moves, we mean that it passes through a series of relations to something fixed, when we say it moves towards a point A, we mean that it passes through an infinite series of relations to point A. When we say that it moves from a point B, we mean that it passes through an infinite series of relations to point B. If we are given only one point, A or B, then the infinite series of relations will give infinite lengths in straight lines. But if we are given two fixed points, A and B, then what we are given is already a relation, and that is where the finitude comes in. Motion by the shortest way between two fixed points means the presence of a third term C, and this C has to pass through *all* the possibilities of

^a A24

^b A25

¹ *Greek Thinkers*, Vol I, p 197

the relationship between itself and AB, and not the few arbitrarily determined by dividing AB by 2, or 10, or any other number. To say that C always does the half of the distance that remains is to choose an arbitrary series of relationships of C to AB and place C successively at those. So that if you say that C never reaches B by this method, you are only showing that C's behaviour under these arbitrarily chosen conditions is not motion from A to B, you have not proved that motion from A to B is impossible.

Another way in which Zeno used to put this puzzle was to say that motion was impossible because it was impossible to pass through an infinity of positions in a finite time. Aristotle refuted this by showing that again he uses infinity in two senses — infinite divisibility and infinite length. Time is infinitely divisible in the same way as the line, the line is finite in length in the same way as the given time. So that the infinitely divisible line is traversed in infinitely divisible time, and the finite length of space in the finite length of time.^a

The second argument was that of Achilles and the tortoise.^b If the tortoise be given a start, Achilles cannot catch up with it, for while he runs that distance, the tortoise will have got further, and so on. Aristotle remarks that this is the same argument as that of dichotomy, except that the division is not necessarily bisection. The given length (the length of the whole race from start to meeting-point) is determined by the finite quantity of the start given by Achilles to the tortoise, and the ratio of their velocity. If Achilles runs ten times as fast as the tortoise, he gives him 9 units start in every 10, or $\frac{9}{10}$ in every 1. If he gives him a start of 1, he catches him up in $1\frac{1}{9}$. The infinite series $\frac{1}{10} + \frac{1}{100} + \frac{1}{1000} \dots \infty$ does not exceed $\frac{1}{9}$, a finite quantity. It is the same problem of the difference between infinite divisibility and infinite length. Achilles does not catch the tortoise at any of the points in the infinite series $\frac{1}{10}$, $\frac{1}{100}$, and so on, but he catches him outside that series, at the $\frac{1}{9}$. A body in motion does not pass only through a series of positions determined by the arbitrary division of the length into tenths, but through all the possible positions.

The third problem, that of the moving arrow,^c is based on the same argument. Nothing can ever get anywhere, if it has

^a A25^b A26^c A27

to pass through an infinite number of positions in a finite time, the length (the arrow) is in the same case as the point.

The fourth^a compares three sets of solids (ὄγκοι), one set (A) at rest, one (B) moving in one direction, another (C) in the opposite direction, at equal speed. It shows that the time taken by the moving solids to reach points equidistant from their extremities is both 1 and 2 — as Aristotle says, according as you measure their velocity by each other, or by those at rest.¹ The points in B and C pass each other twice as quickly as they pass those in A, or any solid in C has passed twice as many solids in B as in A, in any given instant of time. Therefore passage from point to point does not correspond with any given instant of time. This seems to indicate the infinite divisibility of time as well as of space.

He also said that motion was impossible because 'the thing that moves must move either in the place where it is or the place where it is not',^b and both are impossible. To be 'in' a place implies position, rest, nothing can happen to a thing in a place where it is not, therefore motion is impossible. This joins on to the argument about space and place: space is not something containing the object, it is only a property of the object, its outline or boundary. When the body moves, it takes its 'space' along with it.

Lastly, there is the argument on sound. A grain of millet falling makes no sound, how can a bushel therefore make a sound?^c This needs an inquiry into sense-perception. When the grain falls, the effect is 1; when a thousand grains fall, the effect is 1000, but it does not follow that we perceive the 1, though we perceive the 1000. The range of sense-perception is circumscribed, what we call sound is all that comes within those limits, but that the effect is there, though we do not perceive it, can be registered by instruments of greater range than the human ear.

^a A28

^b B4

^c A29

¹ Heath (*Greek Mathematics*, Vol. I, p. 282) regards it as 'incredible' that Zeno should have made this mistake, and he goes some way (though not all the way) towards Bertrand Russell's view that Zeno has been grossly misunderstood and that his arguments contain mathematical truths rediscovered only in modern times (Russell, *Principles of Mathematics*, Vol. 1). But Zeno's arguments must be regarded in relation to what he believed himself to be proving, and his position in the sphere of knowledge must be assessed in relation to all his known work, not only to his arguments on motion. For instance, it can scarcely be claimed that the argument on the falling grain of millet contains any 'immeasurably subtle and profound' theory regarding sound.

Such was Zeno's attack on plurality and its deductions. If you postulate the One as ultimate, you have to call all phenomena illusions. But if in order to 'save phenomena' you introduce plurality into your ultimate cause, you are still unable to explain phenomena. Points with magnitude will not do, neither will points without magnitude. You are starting with something relative, and cannot 'explain' anything by means of it. At the best, you are only describing properties and relations between phenomena, not referring them to an absolute. You cannot make things by adding together a number of units with or without magnitude, the one gives infinity, the other zero. So you cannot get motion by such an addition, your motion will either be infinitely great or nothing. To get motion, you have to take something fixed to start with, then your 'explanation' of motion is merely a description of it as a series of infinite relations to that fixed thing. It is nothing in itself. Whatever you take dissolves into a relationship, that is, into a 'nothing in itself'.

30 MELISSUS

MELISSUS of SAMOS was in his prime about 440 B.C.^a

Though Melissus is said to have associated with Parmenides,^b there is no evidence in support of this statement, which may have arisen from the acceptance of Parmenides' views by Melissus. Nothing is known of him except that he commanded the Samian fleet which defeated the Athenians in 440 B.C., a defeat soon afterwards avenged by Pericles.^c This fact caused the chronographer Apollodorus to fix the *floruit* of Melissus as the 84th Olympiad, 444/41 B.C.^d

Some fragments of his poem *On Being*^e survive, and a tradition deriving from Aristotle.

Melissus accepted the basic axiom of Parmenides, that Not-Being is not, though this is not the form in which he prefers to use it. He does use it, however; it stands at the head of Simplicius' summary of his views in the form 'If nothing exists,

^a A1, A2^b A9, A1^c A1, A2, A3^d A1, A2^e A4

what could be said of it as of something existing?',^a ^{a1} and is referred back to in his other arguments. But the axiom he prefers to use is the corollary, 'that it is impossible for "something" to come into being out of "nothing"'.^b ^{b1}

He accepts all but one of the Parmenidean conclusions from the axiom that Not-Being is not, and denies that the One can come into being or pass away, or change, or move, or have any sort of multiplicity or divisibility. He restates the steps of the arguments several times in a slightly different way from Parmenides. He makes several additions; and in one instance he corrects Parmenides

His most careful work was done on the concept of Limit. He saw clearly by the light of the Parmenidean theory that Limit implies Not-Being. Considering limit in the temporal sense, he restated the proposition that Being is everlasting, without beginning and without end. If Being had a beginning, that is, a coming into being, it can only have come from Not-Being, but nothing can come out of Not-Being, which is nothing.^c A beginning implies an end, since Being has no beginning, it has no end either. Therefore it was, is and ever shall be, it is everlasting.^d He does not put Being outside Time altogether, he calls it infinite in time.

The weak spot in this argument seems at first sight to be the assumption that beginning implies end, and coming into being implies passing away; or as he puts it, that which comes into being must have an end, because it must cease to come into being at some time.^e But Melissus was well aware of the Parmenidean argument, that Being cannot pass away because it would have to pass away into Not-Being, which does not exist, in his arguments on Change, he states this in the form that if Being alters, then what was before must pass away, and what was not must come into being.^f And the derivative of this is stated in his arguments on motion, where Being cannot move because there is no empty space for it to move into.^g He must therefore have been clear about this. Apparently however he laid himself open to Aristotle's attack by trying to state the

^a *Vors* I, p. 268, 1, 15

^b B1

^c B1

^d B2

^e B2

^f B7 §2

^g B7 §7, B7 §10, A8

^{a1} Paraphrase by Simplicius. This was formerly regarded as Melissus' own words, but is now generally accepted as being a summary. Burnet (*EGP*⁴, p. 321) believes this opening sentence to be a quotation

^{b1} οὐδ' αὖτε ἐν γένεϊτο οὐδ' ἐκ μηδενός *ex nihilo nihil fit*

argument in a logically fallacious form after proving that Being cannot have come-into-being, because it would have to come-into-being either from Being or from Not-Being, and both are impossible, he said that what has come into being has a beginning and an end, therefore what has not come into being has no beginning or end, which is a fallacy; and then he based his conclusion that Being, which has not come into being, has no beginning or end, on the fallacy.^a This is unfortunate, since it is not necessary to his proof

Considering Limit in the spatial sense, he made the correction of Parmenides' theory for which he is chiefly famous, we have the fragment in which he says, 'Just as Being is forever, so it must be infinite in magnitude'.^b The obvious reason for this, that if Being is limited it must be limited by Not-Being, which is *ex hypothesi* impossible, is not stated; but it seems clear from his other remarks on spatial Limit that this is what he meant, and that he was not merely transferring his arguments on temporal Limit to spatial Limit. The concept of Limit, directly you apply it to Being, either spatially or temporally, brings in Not-Being, therefore Being is infinite in space as well as in time. Here again, he did not succeed in placing Being outside space and spatial conditions, at least, few nowadays are willing to give him credit for this, though there is a fragment quoted by Simplicius which does expressly deny the corporeality of Being. It says ^c 'If (Being) exists, it must be One, and if it is One, it must be Not-Body. If it had thickness, it would have parts, and would no longer be one'. Everywhere else the Being of Melissus, like that of Parmenides, is talked of as spatially extended when he says that it has no boundary, he means that it is infinitely extended, not that it has no extension in space. This fragment, then, is quite isolated from the rest of his work, Simplicius quotes it as a proof that Melissus regarded Being as incorporeal, but Aristotle ignores it, saying that whereas Parmenides' Being was 'intellectual', Melissus' Being was 'material'.^{d, d1}

We have therefore two courses. to reject it outright, or to explain it away. There is no reason for doing the former except that it does not fit in with his other views on Being, but the attempts at explanation are very unsatisfactory. One way out

^a A10^b B₃^c B₉^d 21A30^{d1} κατὰ τὸν λόγον and κατὰ τὴν ὕλην

is to say that since he uses the word 'thickness',^{a, a1} he is referring to the third dimension only; but this is no help, since elsewhere his 'Being has third dimensional extension, just like Parmenides' sphere, and all space is filled with it. Another way is to say that it is a hypothetical case, not applying to *the* One, but to some other existence, Burnet suggests the Pythagorean spatial unit, or point^b The full argument would then run: 'The Unit, if it exists, must be one, but if it is one, it cannot have body; if it had bulk, it would have parts, and so not be one (that is, not a unit, because divisible)' Therefore the unit or point does not exist,' and Burnet points out that it closely resembles an argument of Zeno's But the argument of Zeno, part of an *Epicheurêma*, postulates. 'Unless Being has size, it does not exist',^c whereas the argument of Melissus, if correctly quoted, is: 'If Being has size, it cannot be One' The latter does seem to lead directly to a criticism of the Parmenidean One, in whatever context it was evolved. Gomperz,¹ while agreeing that the fragment is contradictory to the rest of Melissus' thought, credits him with a vague desire 'to free his omnipresent and completely blissful universal Being from every trace of gross materialism' But he does not tell us why Melissus should think it gross to have extension in space, nor why, if Melissus had this anxiety to free Being from grossness, he did not do so on all occasions.

It is difficult to see how Melissus, if he realized that a thing which has bulk or body has parts and is therefore not a true unit, did not also realize that the Eleatic Being, having spatial characteristics, was in exactly the same case Moreover we have already^d seen reason to believe that Zeno's arguments eventually led him to a position of agnosticism about even the Parmenidean One We can therefore accept the fragment under discussion, and even revert to the interpretation of Simplicius, without giving Melissus credit for an anachronistic conception of non-material existence, for though the expression and the idea, 'non-corporeal',^{e, e1} may have been impossible to him, the criticism which led up to these was not, even if its implications were not fully realized Aristotle's remark that

^a B9^b EGP⁴, p 127^c 29B1^d Above, pp 157-158^e B9^{a1} πάχος^{e1} ἀσώματον, Simplicius' word not the same thing as the expression σῶμα μὴ ἔχειν, attributed to Melissus¹ *Greek Thinkers*, I, p 190

Parmenides' Being is 'intellectual', and Melissus' Being 'material' can be taken as true in the sense that Melissus realized and admitted the corporeality of the Eleatic One, in his efforts to get past the surd in Parmenides' logical concept.

Still considering Limit, Melissus restates the proposition that Being is One. 'if it is not One, it will be bounded with reference to something else,'^a and 'if it exists, it must be one; if it were two, these could not be boundless, but would be bounded with regard to each other'^b This is based, not on the Parmenidean argument, but on his own conclusion that Being must be boundless. He could have repeated the argument of Parmenides, that Being is undifferentiated because, if it is differentiated, Not-Being is brought in — one part can be distinguished from another part only by saying that it *is not* that part, if you have two Beings, one Being *is not* the other, and vice versa. But Melissus preferred to use his own conclusion as to the boundlessness of Being, so that he was evidently aware that he had made an important contribution therein.

He restates the impossibility of Change, in Parmenidean terms; if Being alters, then necessarily it is not all alike, but what was before must pass away, and what was not must come into being. Then, moved by the cogency of this argument, he adds the striking phrase 'If Being were to become different by a single hair in ten thousand years, it would all perish in the whole of time.'^c Admit change in ever so slight a degree, and you give away the whole of existence. It cannot change, and it cannot alter its arrangement, the latter would mean that the previous arrangement had perished, and a non-existent arrangement had come into being. Thus since there is neither destruction nor creation nor alteration, there can be no change of arrangement.^d

He adds under the head of changelessness a sub-division which does not come into the calculations of Parmenides — that of Pleasure-Pain. 'Being does not feel pain. If it did, it could not *be* completely; for an object which felt pain could not *be* continuously, nor has it the same power as that which is sound. Nor could it remain the same, if it felt pain, for it would feel pain through the subtraction or addition of something, and would no longer be the same. Nor could that which is sound feel pain, for the sound, and that which is, would perish, and that which is not would come into being. The same argument

^a B5^b B6^c B7 §2^d B7 §3

applies to grief as to pain.^a Here again, as elsewhere, he does not place Being outside sensation, but gives it changeless sensation. It is as if he wished Being to have all known attributes, including life, so that it should not lack anything; but he raises these attributes to infinity, and when he speaks of Being, although he uses the words of Parmenides, he envisages something quite different — something at least on the way to Aristotle's Unmoved Mover. It is noticeable that what he opposes to pain is not pleasure, but the sound or healthy;^{b, b¹} and he identifies the state of soundness with Being. Thus pain, physical and mental, disease and so on, have no real existence. They are of the particular world of sensation, which is an illusion. This shows an interest, quite foreign to Parmenides and Zeno, in the living organism. It is perhaps an indication that Melissus was not under the direct influence of the Eleatics, but studied their thought from their writings and applied it more widely than they.

He reaffirms the Eleatic doctrine that Being is motionless because there is no empty space for it to move into,^c he is very clear on this point, and goes on to the corollary that rarefaction and condensation of Being are equally impossible.^d This is directed against the Ionians. He gives a definition of fullness. the test of fullness is whether a thing has or has not room in itself to take in anything more, if it has, it is not full.^e Thus a thing is full when it has no empty space in it, and therefore if it is full, no movement is possible^f (inside it). Moreover, that which is rarefied is further from being full than that which is condensed.^g As Parmenides said, 'All is full of Being'.^h Melissus also denies the divisibility of Being, saying that if Being is divided, it moves, and if it were to move, it would not *be*.ⁱ

Lastly, he has an argument obviously directed against pluralist systems that were now being put forward in opposition to the Eleatic denial of phenomena. He regards himself as having given the proof that Being is One, and puts forward this argument as a 'further indication' only. It starts with the famous *dictum*, 'If things were a Many, they would have to be of the same nature as I affirm the One to be'.^j This is sometimes regarded as a remarkable anticipation of the Atomic

^a B7 §§ 4-6^b B7 §§ 4, 5^c B7 § 7^d B7 § 8^e B7 § 9^f B7 § 10^g B7 § 8^h 2B8, v 24ⁱ B10^j B8 § 2^{b¹} τὸ υγιές

Theory.^a But Melissus does not mean that if he is given a Many each unit of which is like his One, he will accept it; he means that Being, if it is to be knowable, that is, real, must be like the Eleatic One — unchanging, motionless, and so on, and that such conditions are impossible unless Being is One. The Atomic Theory is in absolute opposition to Melissus' fundamental proposition, empty space is postulated, the atoms move and are rearranged, and are entirely unlike the Eleatic One except that they are changeless in quality, and as Melissus says, they cannot be like it *because* they are many.

The argument he uses is interesting.^b The theory that Being is Many is used to account for the visible world; people cannot bring themselves to call sensibles an illusion, and so they affirm the reliability of the senses and say that their perceptions are real. Hence earth, air, fire, water, iron and gold, all substances, are real; so too are qualities, black and white, dead and alive. But the senses give us not only perceptions of objects; they give us perceptions of change in these objects. They tell us that hot *becomes* cold, and cold hot, hard becomes soft and soft hard, the living dies and again is produced from the not-living. That which was and that which is do not remain the same, but even the hardest substances, such as iron, are destroyed by friction, and similarly with gold and stone; also, earth and stone can come into being from water. So that what the senses give us is not a real thing, but a thing in process of change, which therefore cannot be known. Thus we have to give up our belief in the validity of the senses, for if they give us what is real, they must give us perceptions that do not change, of things that are what they are, so that we can know them. For 'nothing is stronger than that which really exists'.^c Change means that what is perishes, and what is not comes into being. Therefore since the senses give us perception of what changes, that is, of what is not real, we must also reject their testimony when they tell us that things are a Many. We see Melissus, here as elsewhere, cogently applying the Eleatic doctrine to the particular theories of all other philosophers, both to Ionian Monism, and to the new Pluralism.

Melissus met with severe attack¹ from the critics, especially

^a Burnet, EGP⁴, p. 328

^b B8

^c B8 §5

¹ Not from Plato, who thought him worthy to be named with Parmenides, *Theaet* 180E, 183E

Aristotle, who pointed out the logical fallacy in his argument on the infinity of Being,^a and also stated that his whole position rested on one untenable hypothesis.^b The careful writer of the essay *On Melissus, Xenophanes and Gorgias*^c took his points one by one and suggested refutations; the most interesting point he makes is that the basic proposition of Melissus that nothing comes from nothing is itself a generalization based on perception, and there is no reason why we should accept the validity of the percepts that are the basis of this induction and deny all the rest. If anything, he says, the opinion that things are a many and that they move is more credible than that nothing comes from nothing.^d This really does go to the root of the Eleatic inconsistency, as we saw when considering the prologue to Parmenides' poem: 'you cannot use the senses up to a certain stage and then turn round and deny them, this is suicidal. The writer of the essay goes on to grant to Melissus his axiom that nothing comes from nothing for purposes of argument, and to show that even so the results he obtains do not necessarily follow.^e For instance, granted that something exists to start with, cannot other existences be derived from this by a circular process, one thing coming out of another to infinity, without anything coming into being out of nothingness?'^f He suggests that the solution of Empedocles, four eternal substances giving rise to perishable particulars, is perfectly possible,^g or indeed those of Anaximander and Anaximenes,^h one substrate from which all particulars are derived by a stated process, or that of Democritus,ⁱ all these satisfy Melissus' proposition that nothing can come out of nothing, but he is rather unfairly and superficially isolating this proposition from the whole Eleatic position, of which for Melissus it was but a part. Similarly the essayist argues against the conclusion that Being is motionless.^k first, some people do not agree that there is no Void (Hesiod), secondly, those who do are yet able to conceive of motion — Empedocles and Anaxagoras allow things to move, not into a space, but from one to another, thirdly, what about changes of quality, such as changes of colour or taste? That is a 'motion', but it does not require empty space!

^a A10 ^b A7 ^c A5 ^d A5, ch. 1 §12 ^e Above, p. 147 ^f A5, ch. 2 §2
^g *ibid.* §3 ^h *ibid.* §6 ⁱ *ibid.* §10 ^j *ibid.* §11 ^k *ibid.* §§ 25 sqq.

31. EMPEDOCLES

EMPEDOCLES of ACRAGAS was in his prime about 450 B C

The dates of his birth and death are not known. He is said to have visited Thurii soon after its foundation, so that he was alive in 444 B C ^a. The attempt to make him a combatant on the Syracusan side against Athens in 415 is stigmatized as 'complete ignorance' by Apollodorus, ^b who says that by then he was either dead or in extreme old age, and that the latter does not seem likely, as Aristotle says Empedocles died aged only sixty. Others give the age as seventy-seven, and yet others extend it to ninety-nine ^c. Theophrastus said that Empedocles was born 'not long after Anaxagoras', ^d and Aristotle spoke of Anaxagoras as 'earlier in age, later in works' than Empedocles ^e. His prime can therefore be placed at about 450 B C ^f.

The character and life of Empedocles, as well as his opinions, attracted much attention. In the long account of Diogenes Laertius, many authorities are quoted, including Timaeus (six times), Aristotle (six times), Hermippus (three times), Theophrastus, Neanthes, Satyrus and others. Aristotle frequently discusses his scientific views, and Theophrastus wrote a long critical account of his views on sense-perception ^g. The references in Plato are fewer and more brief, yet he touched upon the outstanding points in Empedocles' doctrines: the elements, ^h Love and Strife, ⁱ the 'passages' of sense-perception, ^j the part played by Chance; ^k and he was deeply interested in the doctrine of transmigration, as can be seen from the myth in the *Phaedrus* ^l. Plutarch found much that was curious to quote from Empedocles, and the latter's religious views made him interesting to the Christian Fathers. But although he has been fairly well treated by summarizers, the chief source of information is of course the hundred and fifty surviving fragments of his two poems, *On Nature* and *Katharmoi* (*Purifications*).

Of the external details of his life, little is known. His family was noble, his grandfather Empedocles won an Olympic

^a A1 §52
^g A86

^b A1 §52
^h A48

^c A1 §52, §§ 73, 74
ⁱ A29 ^j A92

^d A7
^k A48

^e A6 ^f A9
^l 131C1

victory in 496 B.C.,^a and was apparently well known. Some transferred the Olympic victory to Empedocles the philosopher, and made it the occasion for an anecdote on Empedocles' refusal to sacrifice living animals: on his victory, it was said, he sacrificed a bull made of barley and honey,^b or alternatively, expensive unguents like myrrh and frankincense; but this is an obvious invention based on his poems.^c His father's name was variously given, but was generally agreed to be Meton.^d

It is clear from his poems that he owed some of his doctrines to the Eleatics. He is therefore said to have studied under Parmenides or Xenophanes,^e and to have borrowed from them the idea of writing his views in verse. His poems show also that he was steeped in Pythagoreanism, tradition declares his teacher to have been Pythagoras' own son, Têlaugês.^f The tendency to discuss which teaching came first^g reflects a doubt as to which interest, natural science or religion, predominated with Empedocles. The story further was current that Empedocles (like Hippasus, with whose name he was sometimes connected)^h was banned from the Pythagorean teachings for having published them in his poems;ⁱ but this accusation is made about too many persons to be easily credited. Timaeus, the authority quoted, actually couples Plato's name with that of Empedocles in this charge,^j and in Neanthes' account Empedocles' offence is made the occasion for a new Pythagorean law, not to share their teachings with any verse-writer.^k The splendid tribute paid to Pythagoras by Empedocles^{l, l'} is not that of a man deliberately breaking the rule of a sect to which he owes so much.

Apart from stories of his death, there seems to be only one thread of anecdote that is not an obvious expansion of something in his own poems: this thread is the political. He is credited with strong democratic sympathies: he composed civil strife at Acragas, and prevented the setting up of a tyranny, persuading the citizens to choose democratic government;^m he disbanded an oligarchic association called the Ten Thousand,ⁿ he was himself offered the monarchy and declined

^a A1 §51 ^b A1 §53 ^c B128 ^d A1 §53, A2 ^e A1 §§55, 56, A2

^f A1 §§55, 56, A2, A8 ^g A1 §56 ^h A1 §55 ⁱ A1 §§54, 55 ^j A1 §54

^k A1 §55 ^l B129 ^m A1 §§72, 73 ⁿ A1 §66

^{l'} Some ancient writers wished to make out that these verses referred to Parmenides, but this, as Kranz remarks, is unthinkable: the last line is a reference to Pythagoras' many lives.

it, being of independent character and averse from taking office.^a This last event was mentioned by Aristotle and also by Timaeus, who preserved an odd story of a dinner-party where Empedocles first detected signs of a desire for the tyranny in his host, and nipped them in the bud.^b He also expressed his democratic feelings in a practical way, by distributing some of his wealth in the form of dowries to women of poor family.^c These activities brought on him the enmity of the opposite party, who resisted his return to Acragas from one of his journeys, so that he went off to the Peloponnese, and, some said, died there.^d

This on the face of it might be thought to reflect a genuine tradition about Empedocles' activities, as it seems to be independent of his poems. But looked at more closely, it can be shown to have a closer connection with the poems than is generally assumed. True, there is no evidence of democratic leanings or political interests in either of the surviving poems, on the contrary, Empedocles' character as there revealed ill accords with the rôle of a popular leader. This discrepancy is noted by Timaeus.^e Empedocles shows an aristocratic bias in classing princes with seers, physicians and bards as being nearest to the divine.^f But the *Prooemium* to his religious poem is addressed to the citizens of Acragas, whom he calls 'friends', he lays stress on the honour paid to him by *all*.^g This declaration of popularity may have been taken by some to prove a democratic bias, whereas it suggests rather that Empedocles belonged to no party, and relied for his fame solely on the benefits he conferred on mankind through his knowledge of science, especially medicine.

When this is realized, the stories connected with Empedocles' supposed political activities are seen to be no more probable than the stories of his miracles. The tale told by Timaeus^h of his entry into politics, which, it was alleged, was inaugurated by his causing the execution of two of his fellow-citizens, is surely unthinkable: one of Empedocles' strongest religious beliefs was that there could be no greater sin than the shedding of blood, even of animals, it is this crime that has caused divine spirits to be cast out of heaven and to

^a *Ar* §§ 63, 64^b *Ar* § 64^c *Ar* § 73^d *Ar* § 67, § 71^e *Ar* § 66^f *B* 146^g *B* 112^h *Ar* § 64^h Regarded by Burnet as one of the 'obviously genuine traditions' *EGP*⁴, p. 198

wander through the long cycle of earthly existence,^a and it is such a crime that brings Empedocles himself on to the earth. If Empedocles believed that this was the punishment for a crime committed by him long ago in another existence, surely he would have been the last person to perpetrate it on earth; nor if he had been conscious of having caused anyone's death, could he have spoken as he did in these verses. Again, the story that he gave dowries to poor women surely arose from his claim that men and women honour him equally wherever he goes.^b Again, the story of his exile is probably an invention based partly on his own references to himself as an exile from bliss,^c and partly on a desire to refute the slander that he committed suicide by jumping into Etna, it is Timaeus, opposing this legend, who insists that Empedocles went off to the Peloponnese and died there,^d and Timaeus was probably driven to inventing this exile to account for the mystery enveloping Empedocles' end and place of burial. Finally, in the poem obviously written at the height of his fame and popularity — a fame which had spread far beyond the bounds of his native city, and which made him welcome wherever he went — he claims not social or political leadership, but the reverence paid to a physician and a seer.^e His promises to his pupil likewise contain no reference to political power, but only to the control of nature by means of science,^f and he has the typical philosopher's attitude towards the 'miserable trifles' with which ordinary men busy themselves.^g

The other anecdotes are easily traced to the poems. His passionate belief that knowledge would give control over nature^h was coarsened into an alleged claim of magic powers, or even that he had been seen practising wizardry.ⁱ He told his pupil Pausanias that science would give him power to check the force of destructive winds and conduct them back again,^j this was combined with the knowledge of his experiments on the nature of atmospheric air, which led to his 'torturing of bladders and wine-skins',^k and was developed into the absurd story of how he taught the people to check the Etesian gales by stretching bags made of asses' skins on the tops of the hills. This, we are told, gained him the title of

^a B 115^b B 112, v 8^c B 115, B 118, B 119^d A 1 § 71^e B 112^f B 110^g B 111^h B 111ⁱ A 1 § 59^j B 111^k Ch 59 (Anax.) A 68

'Wind-checker'.^a ^{a1} Pausanias was likewise to be able to create rain after drought, and vice versa this became the story that Empedocles once checked a cloud-burst.^b Control over water-supply was combined with medical skill in the story that he cured a plague for the people of Selinus by diverting two good streams into their river, the water of which was polluted.^c He declared to Pausanias, 'You shall restore the life of a dead man back from Hades';^d this inevitably became a story of how he brought back to life a woman who had been dead for thirty days.^e He said, 'I go about among you as an immortal god, no longer a mortal'.^f This led to the story of his appearing to the people of Selinus while they were celebrating the new river he had given them, and how they received him with prayer and obeisance.^g Accounts of his pompous dress and manner must be referred to the same source.^h

The stories of his death were manifold: he hanged himself from a high crag, or he was drowned at sea, or he broke his thigh falling out of a wagon when on a journey.ⁱ But the favourite story was that of his having leapt into the crater of Etna, in order to disappear without trace and so leave behind the impression that he was a god. The story seems to owe its origin to a hostile school of biographers, who were combating the story of his admirers that he had passed bodily into the company of the immortals at his death, as he suggested in his poem that he was about to do.^j Disciples, working on this hint, invented the usual concrete occasion: he had held a sacrifice after the raising of the dead woman, and he and his friends spent the night on the spot. Next day he had disappeared. Slaves when questioned testified to having heard a great voice call 'Empedocles!' and having seen a light in the heavens. Pausanias after a perfunctory search announced a miracle, and declared Empedocles worthy of divine honours.^k Such exaggeration caused those hostile to Empedocles' memory to allege that he leapt into Etna to give colour to this idea.^l Asked, doubtless by the pro-Empedoclean party, how they knew, they retorted that Empedocles had been accus-

^a A1 §60, A2, A3, A13, A14

^b A14

^c A1 §70

^d B111

^e A1 §61, cp §69

^f B112

^g A1 §70

^h A1 §§70, 73, A2, A18

ⁱ A1 §§73, 74

^j B146

^k A1 §67

^l A1 §69, 70, A2, A16

^{a1} Wind-laying was a recognized art in some states: there were official 'Wind-lullers' at Corinth, and perhaps at Athens, at Titane in Sicily a ritual with incantations was performed once a year. See Farnell, *Cults of the Greek States*, Vol V, pp 416, 417

tomed to wear sandals of bronze, and one of these had been cast up later by the fire Timaeus combated these rumours point by point,^a but nevertheless the absurd version persisted, and was quoted as historical by Horace, it has held the field ever since.^b The age of Empedocles' death was given by Aristotle as sixty, by others as seventy-seven, and others as ninety-nine,^c doubtless in order to make it possible for Empedocles to take part in some event thought appropriate to his talents.

To sum up we know no definite facts about the life of Empedocles, as all anecdotes are embroideries on remarks, often misunderstood, in his own poems. All that we know of his life, character and work must be derived from the surviving fragments, especially the apostrophes to his pupil,^d and the address to his fellow-citizens.^e These show him as a man interested only in natural science, especially medicine,^f and in a certain religious doctrine; who scorned the everyday affairs of men, and who believed that knowledge would give power over nature, while purity as he conceived it would lead straight to apotheosis and heavenly bliss. He attained to great fame, being admired by his fellow-citizens, with whom he was on very friendly terms,^g and also by inhabitants of other cities. He travelled to some extent, but whether he ever left Sicily is uncertain.^h On his travels, he was particularly welcome because of his medical knowledge,ⁱ which led many to regard

^a A1 §71 ^b A16 ^c A1 §§73, 74 ^d B1-3, B111, B112 ^e B112

^f Skill in music is suggested by the anecdote relating how he soothed Pausanias, his future disciple, when the latter was about to kill the man who had murdered his father. This is not borne out by the remaining fragments, and being related by Iamblichus may arise from a wish to show yet another student of Pythagoreanism practising music as a therapeutic agent.

^g There is no warrant for believing otherwise. Frg. 112 cannot be taken as ironical, or as contrasting the Acragantines with other cities, without mutilating the text. The anecdote in which E. is reported as saying that 'the people of Acragas live luxuriously as if they are to die to-morrow, but they equip their houses as if they are to live to eternity' (A1 §63) seems an attempt to make him another Heracleitus, and cannot be believed in the face of Frg. 112.

^h Tradition credits him with visits to Olympia (A1 §66, A11), and to Athens during the plague (A3). The latter is of course impossible if E. had been there in 429, Plato could hardly have failed to mention it in connection with Gorgias. The former is made less likely by the existence of a tradition that the *Katharmoi* were recited at Olympia (A1 §63, A3, A12) which looks like an earlier attempt to connect him with that place. The poem would be most unsuitable for recitation at a gathering in honour of Olympian Zeus. The stories told about the alleged visit are legendary.

ⁱ He may have been the head of a medical school or coterie at Acragas: we hear also of a medical rival named Acron (A3, A1 §65).

him as a seer, or even as a god. His death occurred away from Acragas, the place and manner of it being unknown.

As for his character, the verses which drew on him the scorn even of ancient writers, as a braggart,^a have been grossly misunderstood. It is true that he promises his pupil control over natural forces, even over life and death, as a reward for study accompanied by 'good will and faultless care',^b but this is no more than the expression of a passionate belief in the ability of science to accomplish all things, and beside it must be set his warning to his pupil that the powers of man's mind are limited, and the whole truth not attainable by him.^c His poem may end with an uprush of optimism, but it begins with a solemn prayer to be preserved from the madness of those who claim to know more than is proper to man, and who by speaking more than is right in their presumption, lay claim to the topmost throne of wisdom.^d The claim that he was honoured like a god^e in the cities he passed through has been coupled with his belief that he was about to return to his lost godhead,^f and taken to mean that he regarded himself as a divinity walking on earth. This too is a travesty of his meaning.¹ The first passage is spoken rather in gratitude to those who paid him such great honour than in praise of himself, and the latter claim is a part of his general religious theory, not a purely personal claim. He is equally outspoken about his original sin, which caused him like others to fall from heaven, and is merely stating that he believes himself, after having passed through the cycle of existences fixed by Necessity, to be nearing the end of his journey.^g

The fragments we possess are from two books, *On Nature*, in two parts, and *Purifications*. Originally these were said to run to a total of five thousand lines.^h We hear also of a treatise

^a A1 §67^b B110^c B2^d B1^e B112^f B113^g B115, B117 etc^h A1 §77

¹ It has been assisted by the words ὡςπερ εἰκα, formerly taken to mean 'as becomes me' (Diels *wie es mir zusteht*, Burnet, perhaps accepting the too-easy variant reading εἰκα 'as is meet') Kranz, following Fraenkel, declares that the former cannot mean 'as becomes me', and translates *so wie ich ihnen dünke* (*so wie es gezeamt*), i.e. 'which is how I appear to them' (or, reading εἰκα, 'as is becoming') I accept the reading ὡςπερ εἰκα, and the meaning as being 'I am honoured as a god by all, *which is the way they see me*'. Of course E, believing himself to be near his apotheosis, did not quarrel with this view of himself, but this rendering rescues the poem from being a piece of mere bombast, and transfers the emphasis to Empedocles' own kindly feelings towards those who treated him thus.

on Medicine in prose,^a as well as tragedies written in youth, and other poems, including a *Coming of Xerxes*, and a *Prooemium to Apollo*.^{b, b¹} His florid Sicilian style drew on him the criticism of Aristotle,^c who said he had nothing in common with Homer except metre, and was in fact not a poet but a scientist,^c and in another passage, that his poetry is a very unsuitable vehicle for expressing scientific views,^d because of its ambiguity. In the *Rhetoric*, Aristotle classes Empedocles as one of those who use poetry when they have nothing to say but are pretending to say something 'the intention is to deceive, as with oracles. In the *Metaphysics*^e he quotes as absurd the expression 'the sea is the sweat of earth', pointing out that it is poetically admissible, but scientifically valueless. Nevertheless, he recognized Empedocles' natural gifts of expression, and dubbed him, in the *Sophist*, the inventor of Rhetoric, as Zeno was of Dialectic.^f This, in later writers, became the statement that he was 'the first rhetorician', was an excellent orator, wrote oratorical treatises, and was the teacher of Gorgias, or even Teisias.^g

Empedocles in his poem has a few incidental remarks on his method of exposition. He quotes the proverb that 'it is good to repeat twice over what is right',^h and proclaims his intention not to touch on heads merely, but to follow one line of reasoning to the end.ⁱ He points out in one place that he is returning on the path of his song, developing theme from theme in an orderly manner.^j His love of metaphor and strange epithets and high-sounding proper names is obvious from the remaining fragments, these peculiarities were sometimes criticized, sometimes defended.^k The wholly-admiring tribute of Lucretius applies both to his scientific and poetic gifts.^l

The poem *On Nature* was addressed to his pupil Pausanias, that on the *Purifications* to the citizens of Acragas. Acragas was the home of an intensive cult of Demeter and Persephone; eschatological doctrines flourished there, as we see from Pindar.^m There can be no doubt that Empedocles' views,

^a A1 §77, A2^b A1 §§57, 58^c A22^d A25^e A25, B55^f A5, A1 §57, A19^g A1 §58, A2, A19^h B25ⁱ B24^j B35^k B60, B148-51^l A21^m *Pyth* XII^{b¹} Said to have been destroyed by a sister, or a daughter, the *Prooemium* accidentally, the Persian poem purposely because it was unfinished¹ Cp the complete misunderstanding of Aristotle's views in Diog L (A1 §57)

whatever they owed to Pythagoras and others, are rooted deep in the soil of his native city, which was a colony from Gela, founded in 580 B.C., with an admixture of citizens from Rhodes.

Two apophthegms are quoted which seem to have no original in the existing fragments. The first is as follows: to a man who said 'I cannot find anyone wise', Empedocles replied. 'Naturally. The man who seeks a wise man must himself first be wise'.^a This seems to be an illustration of Empedocles' doctrine that like is perceived by like. Another illustration of the principle of 'like to like', twice quoted by Aristotle, was a story that Empedocles, when asked why a certain dog always chose to sleep on the same tile, replied that the dog possessed something which was 'like to the tile'.^b But in what this likeness was supposed to consist, Aristotle does not mention.

The fragments, taken by themselves, afford what must be a fairly comprehensive account of his beliefs. Opinions differ as to their order; the arrangement of Diels is as coherent as any.¹

The poem *On Nature* opens with an address to Pausanias,^{c, c¹} and there follows a statement of the unavoidable limitation of human knowledge, for two reasons: the weakness of the instruments, and the circumscribed experience of the individual. The senses are feeble, the intelligence at the mercy of circumstance, life is short, and each man sees only what happens to come before him, so that he grasps the part and thinks it is the whole. Pausanias himself, however, since he has withdrawn himself here, shall learn as much as, though no more than, the human mind can attain.^d

Next Empedocles calls on the gods to preserve him from the madness of presumption, and on the Muse to keep his lips pure, telling only what it is lawful for men to hear. She cannot (like some mortals) be deceived by ambition into saying more than is right. He then gives one criterion for examining

^a A20

^b A20a (new to Diels, 5th Edn.)

^c B1

^d B2

^{c¹} Probably preceded by something else (now lost) such as 'Not to others do I impart these things, but do *thou* hear, Pausanias', or an invocation to the Muses. Cp. Diels, note *ad loc*.

¹ It was finally accepted by Burnet EGP⁴, who formerly used that of Stein. The arrangements of Karsten, Stein and Bignone are given in Diels Edn. 5.

the evidence of the senses: the contribution of each sense must be compared with and checked by those of the others, and each must be given equal credence.^{a, a1} He calls the senses 'the paths by which we get knowledge' Mistrust of their betters is a mark of inferiors, but Pausanias is to accept the trustworthy *dicta* of Empedocles' Muse, digesting its Logos in his inward parts ^b The next fragment is an exhortation to secrecy in the Pythagorean manner,^c but whether it should come here, or what kind of secrecy is meant, we are not able to say.

He then lays down the four primary substances, or 'roots of things'. He calls them by mythological names shining Zeus, life-bearing Hera, Aidoneus, and tearful Nestis ^d This led commentators to say that he said the Elements were gods.^e They were also in doubt as to which name applied to which element.^f Nestis was obviously Water, but was Aidoneus Earth or Air, Hera Earth or Air, Zeus Air or Fire?^g Aetius is probably recording the correct interpretation, that is, that Zeus and Hera are Fire and Air (Aether), reigning as they do in the heavens, and that Aidoneus, god of the underworld, is Earth Aidoneus' association with Demeter and Persephone, so closely related to earth, makes this almost certain, and he would then be coupled with the to us unknown Nestis, probably a local water-goddess, as a lower deity The names were of little importance to Empedocles. elsewhere he calls Fire Hephaestus ^h

These four elements were uncreated ^h Between them they account for all the substances we know Nothing in this perishable world has any essential nature, nor has it any end in death, there is only mixing and separation 'Nature' is a term applied to things by man ^{i, i2} When the elements are mixed to form a man, a plant or a bird, this they call Becoming, when

^a B3, cp B114 ^b B4 ^c B5 ^d B6 ^e A32, A40 ^f A31, A1 §76, A23

^g B96, B98 ^h B7 ⁱ B8

^{a1} The earlier part of this is an attack on some person or persons It contains Parmenidean echoes, *e g* the Muse who drives her 'well-reined car' from the realm of Piety The theory of sense-perception is directly opposed to that of Heraclitus (22B55, 101a, see p 117)

ⁱ¹ Φοις according to Plutarch and all commentators, here meant 'birth' Burnet finds good authority in Aristotle for taking it here to mean 'substance', i.e. essential nature EGP⁴, p 205, note 4 See Aristot *Met* IV, 4 1015 a1

ⁱ² The reason for the confusion was that he called Hera Φερεσβιος, 'life-bearing', an epithet elsewhere confined to earth and corn, but not necessarily in Empedocles, whose use of epithets tended to be original (see B4) though he could also use them conventionally when he chose (B10) For a different view, see Burnet EGP⁴, p 229, note 3

the elements separate, they call this Death. This is a wrong way of speaking, but Empedocles himself follows the custom and calls it so.^a Nevertheless, to believe in Becoming and Passing Away as an actuality is silly.^b Nothing can come from nothing, and whatever is cannot be destroyed.^c The Eleatic demand is thus satisfied. The Eleatics were equally right in saying that there is no Void.^d This theory applies equally to human life: what we call 'life' is not 'existence', nor is death 'destruction', life is merely a period in which things are joined together to make a human being, and death is merely a dissolution of this compound, since nothing can be annihilated.^e

To this description of the Four Elements the summarizers add little.^f Aristotle points out that Empedocles added Earth to the other three,^g but he ranges Fire against the group Air-Water-Earth, attributing this grouping to Empedocles.^h They are not assigned special spheres, but move about and take each other's places.ⁱ They are, internally, atomic in structure, that is, composed of tiny particles, which are divisible but never actually to be divided.^j The elements mix, not by running through each other, but by the juxtaposition of these tiny particles,^k new substances are formed from the combination of these as when iron rust, brass, calamine and copperas are pounded together in an inseparable mixture.^l Some accepted the doctrine that the elements, themselves unchanging and eternal, lost their identity when mixed together,^m others doubted if this process could account for true, that is, qualitative change.ⁿ Aristotle, describing Empedocles' views on the formation of flesh, bones and the like, censures him for not seeing that it is not the elements but the Logos of their admixture that makes things what they are.^o

Next we come to the other two original Causes, Philia and Neikos (Love and Hate). They likewise are everlasting, and 'boundless time shall never be emptied of that pair'.^p To describe them fully involves a description of their functions, the processes by which so-called creation is begun, and its products scattered again. The fragment describing this is the most important that survives, it comes from the first book of his scientific poem.^q

^a B₉ ^b B₁₁ ^c B₁₂ ^d B₁₃, B₁₄ ^e B₁₅ ^f A₂₈-A₄₄
^g A₂₈, A₃₇ ^h A₃₆, A₃₇ ⁱ A₃₅ ^j A_{43a}, A₄₄ ^k A₄₃
^l A₃₄ ^m A₄₁ ⁿ A₄₄ ^o A₇₈ ^p B₁₆ , ^q B₁₇, cp B₂₆

Love and Hate are classed with Earth, Air, Fire and Water: Hate is apart from them, equal in weight in all directions,^a and Love is in them, equal in length and breadth. The pupil must pay special attention to Love: it is the same thing as that which is implanted in mortal limbs, the cause of kindly thoughts that make for harmony, and named Joy and Aphrodite; Empedocles claims that he is the only man to have identified her in these various activities^b It is to be noticed that from his description Love is not merely physiological; her province is the psychological as well, and though for him these two, as appears later, formed ultimately one class, nevertheless he makes it clear that the manifestations of Love are in thought and feeling as well as in bodily attraction^c He does not describe Hate in the same positive way, but goes on to say that the two have each a distinct character, and are equal in power, they rule in turn.^c Plato pointed out that the forces of attraction and repulsion are present in Heraclitus' scheme also, but that with him they work simultaneously, whereas with Empedocles they work alternately^d The Four Roots are, like the two Forces, everlasting, all six together form the Whole, and are not destroyed, nor is there anything beside them For this he gives the Eleatic proof^e

The beginning and end of this fragment^f describe the double process due to the alternate rule of the pair At one end of the course things are a One, being mixed together completely by Love, at the other end, things are a Many, that is, the four elements, separated by Hate The Becoming and Destruction of a world takes place at two stages — during the inroad of Love, and again during the inroad of Hate So that from one point of view there is change and 'destruction', that is, in so far as the elements are always being worked upon so as to come together or separate, from another point of view, there is no change and no destruction, in that the circular process never ceases The process is unchanging But we

^a B17, vv 18-20^b B17, vv 21-26^c B17, vv 27-29^d A28^e B17, vv 30-33^f vv 1-13, 34-35

^{a1} Reading with Sextus, ἀτάλαντον ἀπάντη There seems no reason for altering the reading to ἐκαστῷ and translating 'equal in weight to each', nor for taking v 20 to mean that Love is 'equal in length and breadth' to each of the others What is meant is that Hate, a force conceived as corporeal, is homogeneous in mass when it collects outside the Sphere, whereas Love, inside, is coextensive with the Sphere Later (v 27) he tells us that they are all equal to one another

¹ Hence Φιλότης, not Ἔρως Ἀρμονία is also used (cp B18)

have more than changelessness of process: the elements themselves never change their nature, but merely run through one another and produce different things at different times while themselves remaining unchanged. This fragment shows Empedocles trying to mediate between Eleaticism and phenomena, and taking a force observed at work in the world as his unifying principle. The corporeality of the forces is notable. weight, length and breadth are assigned to them, and as Aristotle pointed out,^a in one sense they are moving causes, or forces, in another, material causes as being part of the mixture. The absence of Void is also notable: without Void, it is hard to see how things could ever begin to move, much less 'run through one another'.

The poem then goes on to particularize all things, animate and inanimate,^b are thus produced, even the 'mass of mortal limbs'.^c When the limbs come together under the influence of Love, they form a body, and human life reaches its acme, then Hate separates them again, and they wander apart 'on the shore of the sea of life'.^d So it is with everything else — plants, fish, animals and birds, the heavenly bodies, even the gods themselves. The elements alone exist, the substances remain the same, the combinations alter: so great is the power of Mixture to change them.^e He illustrates the power of Mixture by the analogy of painting — the mixing of colours and the portrayal of all shapes and forms by means of them.^f Love, though able to unite even those things which are most hostile, that is, most amenable to the commands of Strife, nevertheless begins by uniting things most adapted for mixture, and so the first mortal objects to be created from the four elements are the Sun, the Earth, the Sky and the Sea, the parts of which are inwardly harmonious.^g The more that substances differ in origin, mixture and form, the more unwilling they are to unite, because of the working of Hate in them, to which they owe their origin.^h Aristotle remarked that there is a sense in which Love separates and Hate unites: Love separates the four elements, that is, destroys their internal unity in making the world, and Hate brings them together again into four parcels.ⁱ This is of course true: it is the business of Love to unite all things, including those most

^a *Met.* A10, 1073b3^b B21^c B20^d B20^e B21^f B23^g B22^h B22ⁱ A37

hostile to one another, in a complete mixture, and to do this, she has to separate particles of like substances, because, as Empedocles believes, like naturally cleaves to like. This natural attraction of like to like is not by him regarded as a separate force, but as something depending simply on the character of each element, as Burnet saw.¹ And though this operates only when Hate is gaining ground, yet Love has to take account of it, and she does so by first uniting substances most adapted for mixture, her action being gradual.

Next is a description of the state of affairs when Love is in the ascendant. There is no differentiation in the mass, all the substances are 'fixed together in the close covering' of Love, which he here calls *Harmonia*. The result is the 'rounded Sphere, exulting in its circular solitude' ^{a, a1} Hate is completely excluded, as he expresses it, 'there is no strife nor unseemly conflict in its limbs' ^{b, b1} The Sphere actually has no limbs — no arms, legs, or reproductive organs; ^c Simplicius, quoting this, says that Empedocles called it 'god', and in the *Katharmoi* is a fragment part of which describes God in the same terms. It is like the circular Being of Parmenides, with the addition of feeling made by Melissus. Empedocles, however, while accepting the Eleatic concept, declares that it is not the ultimate and sole reality, but only one end of an alternating process. A metaphor describes the effect produced. it is as when milk is coagulated and 'fixed' by rennet ^d Another metaphor is of a man 'cementing' barley-meal with water, ^e and another that of the potter mixing earth with water and hardening with fire ^f

We then learn what happens when the return of Hate is due. There is a movement in the Sphere. 'all the limbs of the god began to tremble in turn' ^g This happened when 'Hate had grown big within its limbs, and rushed up in the course of time to claim his rights, time which alternates for them, being fixed by a broad oath'. ^h These two fragments present a

^a B27

^b B27a

^c B29, cp B134

^d B33

^e B34

^f B73

^g B31

^h B30

^{a1} The quotations on the nature of the Sphere have become confused another version preceded this line with 'But he was equal in all directions, and utterly without end' (in time, presumably)

^{b1} This frg was quoted by Plutarch as referring to the philosophic man. It was ascribed to Empedocles by Wilamowitz, and applied to the Sphere

¹ EGP⁴, p. 233

difficulty: we have been told that Hate was utterly excluded from the limbs of the Sphere, now, it seems, Hate has been growing within all the time, and when the moment comes, he stirs, causing all the limbs of the Sphere to tremble. These expressions may be metaphorical; but they seem rather inept, as they suggest an entirely different picture from that of a circular Sphere without limbs, from which Hate is excluded.^a The mention of a 'broad oath', not otherwise explained, brings in another Cause, a ghost of the Design which he elsewhere denies. For this he was criticized by Aristotle.^b

The stage at which Hate is in the ascendant, if he described it, is not preserved, but we are told in detail of the return of Love.^c It appears that a circular motion has been set up — how, is not said. The Sphere was at rest,^d hence this motion must have been begun by Hate, the 'trembling' in the Sphere being the precursor of the vortex.^e Again there is great difficulty in envisaging the process: Hate falls down 'to the bottommost depth of the whirl',^f and Love gets into the middle; presumably Love was entirely excluded before, and by 'the bottommost depth' we are to understand the outside. All through the description, Hate is moving out, until it reaches the outermost boundary of the mixture.^g The process is gradual. Hate slowly receded to the 'outermost limit of the circle', while an 'immortal kindly rush of blameless Love' is entering in. The end is complete mixture or coagulation again; but meanwhile all the innumerable combinations which are the things of the perishable world are produced, 'a marvel to behold'.^h

It is not, however, possible for Empedocles to describe in very great detail the world thus created by Love; for the world in which we live is that created by the inroad of Hate, that is, the articulation of a world from a coagulated mass, not the combination of things from four parcels of opposites.ⁱ He said, according to Aristotle, that the world as ruled by Love was like our present world, which owes its origin to the other process, the return of Hate.^j Other summaries of this part of the poem^k add nothing to the material of the fragments;

^a B35, v 10, B36

^b B30

^c B35

^d A38

^e B35, vv 3, 4

^f B35, v 10, B36

^g B35, v 17

^h A42

ⁱ A42

^j A28-33, A37-42, A45, A52, A78

^k The vortex may have arisen later, after the first separation had been begun, one summarizer says that it was started by the chance pressure of fire at some point of the mass, but he adds no further explanation (A30)

but some of the comments are interesting. He was the first, Aristotle says, to distinguish a double cause of motion, acting oppositely, in place of one,^a in later writers, this becomes the 'alternating sway' in which each destroys the world of the other.^b The mixing and separation, says Aristotle, in turn are brought about by Necessity (*Anankē*);^c this is the 'broad oath' that decides the time when the motion is to begin. In the interval, things are at rest.^c Aëtius states that Philia and Neikos together make up this *Anankē*^d Lastly, Aristotle commented on Empedocles' obvious preference for Love, a preference which comes out everywhere in the language he uses about the pair. Love is no mere impersonal force, it is kindly, blameless,^e the cause of Joy and Harmony,^f whereas Hate, though mighty,^g is baneful,^h and its commands are grievous.ⁱ It is the mixture only, Aristotle remarks, which Empedocles praises,^j and if one follows his intention, not his inadequate expression, it is clear that Love is the cause of everything good, Hate of everything bad; and Empedocles must be given credit for having been the first to offer a cause of good and evil.^k Elsewhere Aristotle asks, is Love the cause of a chance admixture or of a proportioned combination? Is she the Logos, or something over and above it?^l Empedocles contradicts himself on this score, speaking as if chance encounters of substances brought together by Love were sufficient to account for all forms, and yet calling Love the author of harmony, and choosing the metaphor of the painter mixing colours according to harmony or proportion.^m

Then follows a cosmogony. His description of the creation of our world is not preserved, and isolated quotations are often difficult to set in their context. For a detailed account we have to refer to the summarizers, whose chief source seems to have been Theophrastus.ⁿ They begin with the Mixture, that is, the Sphere under Love, and agree that in the revolution that was set up, Air was first separated off, then Fire, which hardened the Air, then came Earth, and Water was squeezed out of the Earth. The outermost circle is therefore glazed Air, inside this is a revolving sphere, one half of which is Fire, producing Day, the other half Air and a little Fire, producing Night.^o For Air as an element he uses the word Aether (Fiery

^a A37 ^b A52 ^c A38 ^d A45 ^e B35 ^f B17, vv 23, 24 ^g B30
^h B17, v 19 ⁱ B22 ^j A40 ^k A39 ^l A78 ^m B23 ⁿ A30, A49 ^o A30

Air), Air, or Moist Vapour, is exhaled from the sea^a, ^{a1} after the four elements have been separated out. Then follows the creation of the heavenly bodies. There is only one universe at a time, but this is not the whole: merely a small part of the mixture. The rest is inactive matter.^b Creation, once started, is a matter of chance no god took part in it.^c Aristotle quotes a line of Empedocles to illustrate the part played by Chance even at this stage: 'For so (the Aether) chanced to be running at the time, though often differently',^d and we learn from Aristotle's comment that Empedocles made the Aether flow upward, and then settle down upon Earth,^e in the creation he was describing. Fire also rose upward,^f apparently because there was nowhere else for it to go, and because it was driven by the pressure of the Air.^g

The basic visible substances which make up our universe — sun, earth, sea and sky — which have internal homogeneity,^h come from the elements,ⁱ and that is why they are reluctant to mix. Very few of Empedocles' own utterances about the heavenly bodies and all that goes with their study have been preserved, and even those which have been preserved are often mere epithets or phrases, throwing little light on his scheme. He speaks of the sun, and the 'immortal bodies bathed in heat and bright radiance', meaning by the latter the heavenly bodies, and by the former the original sun from which they get their light.^j In the Sphere coagulated by Love, the 'swift limbs' of the Sun and the 'shaggy might' of Earth are not articulated.^k The sunlight is collected together, and circles round the heavens.^l The sun is 'sharp-shooting', the moon 'kindly',^m the sun and moon both go round the earth.ⁿ The moon 'gazes at' the sun,^o and gets her light from him.^p The moon's orbit is close to earth, as the nave of a wheel circles round the goal.^q Eclipses are caused by the moon's passage between earth and sun.^r Night, 'lonely, blind-eyed', is caused by the earth's coming in front of the rays of the sun.^s, ^{s1} The

^a A49^b A47^c A48^d B51^e B54^f B51, B54^g A30^h B22ⁱ B38^j B21^k B27^l B41^m B40ⁿ B44, B45^o B47^p B41^q B46^r B42, B49^s B48, cp A30

^{a1} The distinction he drew between αἶθρ, bright Air, and ἀήρ, moist Vapour, was not always preserved in the summaries, e.g. Ps -Plut *Strom* (A30). The Ionic words θυμασθῆναι and πιησθῆναι are used for Exhalation and Condensation (A49).

^{s1} This takes place when the fiery hemisphere is on the 'under' side and throws the earth's shadow 'upwards'.

'depths' of the earth are not infinite this is a foolish opinion which has dropped forth from the lips of many¹ who have seen but a little of the whole.^a Many fires burn beneath the surface of the earth.^b Sea is the sweat of earth.^c Salt was solidified by the sun's rays.^d Iris brings from the sea the wind or a mighty rain-storm.^e These scraps are all that remain of his own words.

The summarizers, however, describe his meteorological views in some detail. The sun, they tell us, is a reflection of the fiery vault from the surface of the earth,^f its movement follows that of the fiery hemisphere. The reflected sun is the same size as the earth.^g The vault of heaven is solid, being air hardened to a crystalline consistency by fire.^h Its height is less than its width, the universe being shaped like an egg (lying on its side), the sun follows its outermost boundary.ⁱ The sun is prevented by the sphere enclosing him from going straight on, and is turned by the 'tropic' circles.^j The rapid motion of the outer vault keeps the earth in the middle.^k The light which is given off from the fiery hemisphere is an emanation consisting of tiny particles, leaping off from its source at a tremendous speed, the motion is so swift as to be invisible to us.^l The moon is air collected together like a cloud, and solidified by fire. It gets its light from the sun.^m It is not a sphere, but lentil-shaped, or disc-shapedⁿ (so that it appears round at the half-month, but turns sideways at the waxing and waning). It is twice as far from the sun as from the earth.^o The moon, therefore, is in the region of earth, which is 'full of ills', the region beyond the moon is purer.^p The moon is the cause of eclipses of the sun.^q The stars are of fiery material, a portion of which was enclosed by Air and carried with itself during the first separation.^r The fixed stars are tied to the crystal vault, the planets are free.^s All these things were created by chance.^{t, u}

Earth collected in the middle of the universe.^v The sea was

^a B39 ^b B52 ^c B55 ^d B56 ^e B50 ^f A56 ^g A56 ^h A51

ⁱ A50 ^j A58 ^k A67 ^l A57 ^m A60, cp A55 ⁿ A60 ^o A61

^p A62 ^q A59 ^r A53 ^s A54 ^t A48 ^u A49, A67

^f Burnet pointed out that the account in Aetius contains an error, that of saying that the fiery hemisphere was 'opposite' its own reflexion. The reflexion from earth can only be back on to the fiery hemisphere, since this is 'above' when it is day. EGP⁴, p. 238.

^t Plato, *Leg.* X 889B. He appears to be describing creation during the inrush of Love, i.e. combination of objects by chance contacts, not separation from the original mass as in our world.

¹ Xenophanes was one of these. See p. 100.

heated out of it by the sun, hence the expression 'the sea is the sweat of earth' ^a Any wet thus collected on the outside was driven into sunken places by winds ^b Even after the creation of earth and sea, the elements still moved about at random, sometimes fire getting the mastery and burning all up, sometimes the watery influx overflowing and washing over. ^c ^{c1} Winter is explained as the mastery of Air which is driven in a condensed form into the upper region; summer comes when Fire gets the upper hand and drives the Air into the under region. ^d The 'slant-wise' motion of winds is due to the opposite motions of the airy and fiery hemispheres. ^e ^{e1} Lightning is caused by the separation of light out of a cloud, which has held a portion shut up within itself ^f ^{f1} Hot springs are caused by the fires within the earth ^g Stones, rocks and crags likewise were formed inside the earth, by heat, and were later borne aloft ^h Before leaving inanimate nature, it remains to add that he explained the quality of the magnet by the effluences from the magnet and the iron, which fit each other ⁱ This seems to be due to the working of Love, not Hate, Love being to some extent still active in our world, though it is losing ground The earth itself is said to have been shaped by Love, which mixed it with water and hardened it with fire, presumably after the preliminary separation ^j

Next comes the creation of living organisms — animals and plants — and the discussion of allied questions such as growth and reproduction Again, a coherent account cannot be drawn from the remaining fragments The creation of animals, birds, fish, plants and the rest, in all their varied forms, is due solely to mixing when the elements come together, that is Birth, when they separate, that is Death ^k The still-continuing competition between Love and Hate is thus obvious in mortal bodies ^l The order of creation was first trees, then animals, ^m trees, the first of living things to be created, arose before the

^a A66^b A66^c A66^d A65^e A64^f A63^g A68^h A69ⁱ A89^j B73^k B9, B71^l B20^m A70, cp B21, B23

^{c1} But probably this too belongs to the period of creation from these separate elements, and describes what happened before Love had succeeded in achieving a better mixture

^{e1} Olympiod *in Meteor.* A 13, 102, says 'earthy and fiery', no doubt mistakenly

^{f1} This is Aristotle's statement, it accords better with Empedocles' general theory of creation by separation than does the account of Aetius, that lightning is caused by the impact of light on a cloud (A63) This was the usual view Empedocles seems to have been original in suggesting that the lightning was engendered *in* the cloud

universe had completely separated out, or 'before day and night were divided'.^a The manner of creation of animals presents some difficulty, as some of the fragments are quoted as referring to the régime of Love, others to that of our own world. Under the former head come the lines. 'many foreheads without necks sprang forth, arms wandered bereft of shoulders, eyes strayed about alone, lacking brows',^b and: 'as divinity mixed more and more with divinity, these things fell together as each chanced, and different creatures were continuously produced',^c also 'creatures facing both ways, with double face and breast, cattle-kind with men's heads, and conversely, men-kind with heads of cattle', of mixed sex, both male and female in one.^d These, then, were the first attempts of Love to bring things together after the régime of Hate. In his Second Book Empedocles described the opposite process, the creation of whole forms from the earth, mixtures of earth and water, these were driven upward by the fire in the earth, striving to reach its like (under the impulse of Hate). These whole forms had not yet any separate limbs or separate sex, they became men and women as the process of separating out (under Hate) continued.^e Empedocles appears to have suggested that sexual desire was a yearning of the separated bodies to become one again as before, and as recollection (*Anamnêsis*) prompted; this foreshadows the theory attributed by Plato to Aristophanes in the *Symposium*.^f Aëtius, outlining four stages of creation,^g appears to be describing the whole cyclic process, not the creation in our world only, though he himself does not seem to be aware of this. He says that plants and animals as originally created were made up of incongruous parts; the second created forms had their limbs 'grown together', the third were 'whole forms', and the fourth were no longer made out of homogeneous elements, but were reproduced from one another in various ways. The first two stages are clearly those described in Fragments 57, 58 and 59; and the third and fourth those described in Fragment 62.^h The species separated into groups according to the element predominating in their composition, those with most water seeking the watery element, those with most fire flying upward into

^a A70^b B57, cp B58^c B59^d B61, cp B60, 1 (Orpheus) B13^e B62, cp B63^f B64,^g A71^h See Burnet, EGP⁴, p. 242 sqq

the air, the heaviest sinking on to earth and so on.^a An exception occurs in the case of some aquatic animals, in which Fire predominates. these take to the water to counteract their natural excess of heat^b (an example of like seeking unlike).¹ Flesh consists of an equal mixture of all four elements; sinews are made of fire and earth mixed with twice the quantity of water, nails are sinews cooled at the tips by contact with air, bones are composed of two parts each of water and earth to four of fire, these parts being mixed together inside the earth.^c Empedocles himself says that bones were 'fitted together by the cementing of harmony',^d which as Aristotle says is an admission that their admixture has a law, and is not due to chance.^e The tendency of the fiery element is to rise and the earthy element to sink, each seeking its like, but in some the rarer portion is inside and the denser outside, as in turtles and shell-fish.^f Hair, leaves, scales and feathers are the same,^g but they have developed in different ways, and where the development helps survival, it is retained. For instance, the hedgehog's hair has developed into sharp-pointed quills, and other animals have other weapons.^h The spine with its vertebrae was the result of an accidental turning of the neck and breaking it.ⁱ Thus purpose is eliminated.

The general rule of growth for all living organisms is that like nurtures like: fire increases fire, earth increases earth, air increases air.^j In particular, living creatures need heat; they grow by its presence. They also need moisture, and diminish and perish by lack of either of these constituents (Hot and Moist).^k In the past, the men were giants, in comparison with whom present-day men are like babes.^l Fish^m are nourished by water, but not the briny sea: there is sweet water, not perceptible to all, in the sea, and this nourishes the fish.ⁿ The proof of the presence of fresh water in the sea was to lower a wax vessel empty on to the surface of the sea, and leave it for a day and a night. When drawn up, it will be full of fresh water.^{o, o'}

^a A71 ^b A71 ^c A78, B98 ^d B96 ^e A78 ^f B76, B75 ^g B82

^h B83 ⁱ B97 ^j B17 ^k A77 ^l A77 ^m B74, B72 ⁿ A66 ^o A66

^{o'} Apparently it was not realized that the water so obtained came from the atmosphere. Empedocles' view was adopted by Democritus, Aristotle and Theophrastus, the experiment is attributed to Aristotle, but may well originate with Empedocles.

¹ Love of course is still at work in the world, otherwise nothing could exist. Love is said to make the Earth (B73), the fish (B74), the animals with dense interiors and rare exteriors (B75), the eye (B86, B87, B95), the bones (B96).

Another fragment, apparently relating to nourishment, says that 'sweet seized upon sweet, bitter rushed to bitter, sour moved towards sour, and hot settled upon hot'.^a This probably refers to growth in plants. Empedocles was the first to show a special interest in botany. He believed that trees were the first of created things, and either retained the combination of male and female sex which was a characteristic of animals as well at the beginning of the régime of Hate, or divided into male and female.^b They grew by raising themselves out of the ground, as the heat in the earth^c sought the heat in the heavenly vault above. The difference in their quality depends on the earth out of which they spring. It is not the vine that accounts for the quality of the wine,^d but the nurturing base,^e since growth is addition of what is homogeneous. The roots are wholly increased by earth with its mixture of water; but the shoots (branches) owe their growth to the Aether.^f (Aristotle pointed out that this is wrong: the whole plant is really of one substance and has one creative cause.) They also take in moisture from the environment, and the amount they can hold determines whether they are evergreen or deciduous.^g The fruits are the 'excess' left over from the water and fire in the plants, like excrement.^h Some, however, owe their origin to sexual reproduction. Empedocles calls the olive 'egg-bearing', a metaphor which Aristotle commends,ⁱ as showing that seeds, like eggs, have a nutritive and a reproductive part. It may be that in speaking of fruits which were the 'excess' of what plants live on, he was thinking of succulent fruits such as the apple and pomegranate,^j which also contained seeds. There can be little doubt that Empedocles' theory of growth by the addition of like to like formed a basis for Anaxagoras' theory of 'seeds'.

His general theory of reproduction is that living organisms are generated when heat and moisture undergo a kind of corruption.^{j, j¹} In human beings, Love still working in the world brings the sexes together, desire being aroused in them through sight.^k The child, before conception, is partly in the

^a B90 ^b A70 ^c A70 ^d A70 ^e A70 ^f A70, B77, B78 ^g A70
^h B79 ⁱ B80 ^j A76 ^k B64

^{j¹} Since digestion also was to him a kind of corruption, there seems to be some connection in his mind between excretion and generation (A77).

¹ Wine is water which has been putrefied in the wood (B81). The kinship of water and wine is shown in that they will mix, whereas oil and water will not (B91).

man, partly in the woman.^a Its sex is decided according to the part of the womb into which the seed falls: if into the warmer part, the result is a male, if into the colder, a female,^b and this accounts for the distinctive characteristics of males, such as colouring, growth of hair and superior strength.^c (Aristotle criticizes this as 'too easy-going', as it fails to account for the organic difference between males and females)^d Some commentators thought that the womb had a hot side (the right) and a cold side (the left), but Aristotle says that the temperature depends on the menstrual flow, according to whether it is hot or cold, older or more recent.^e Others say that as Empedocles thought sex-differentiation depended on temperature, the first males were born in the east and south, the first females in the north.^f Empedocles connected the menstrual flow with the phases of the moon, without allowing for irregularities.^g

Difference of temperature also determines the question of resemblance.^h If both the parents' seed is equally hot, a male like the father is born, if the seed of both is equally cold, a female like the mother. If the father's seed is the hotter, a boy with his mother's features is born, if the mother's seed is the hotter, a girl with her father's features. If children are born which are like other people and not the parents, they are formed by the imagination of the mother. Twins and triplets are formed through superfluity of semen, their sex depending on the temperature of that quarter of the womb to which each goes. Monsters may arise from a superfluity of semen, a deficiency, a disturbance of its motion, a separation into parts or a division.ⁱ Likewise, for sterility or inability to reproduce, as in mules, he seems to have suggested several causes: the position or shape of the womb, preventing the arrival or acceptance of the semen,^j and the nature of the semen, which, though soft, combines to produce a hard substance, as when brass is mixed with tin.^k

Gestation of the embryo takes place through two vein-like and two artery-like vessels attached to the liver.^l On the tenth day of the eighth month the blood becomes 'a white putrefaction', that is, milk.^{m, m1} The heart is the first organ to be articu-

^a B6j^b B65, cp B66^c B67^d A81^e A81^f A81^g A80^h A81ⁱ A81^j A82^k B92^l A79^m B68^{m1} Aristotle commented that 'Empedocles either was wrong or used a bad metaphor'

lated. Articulation is begun on the thirty-sixth day, completed by the forty-ninth day;^a males, however, form more quickly than females.^b The child is enveloped in a caul, which Empedocles called a 'sheep-skin' ^c There are two times of birth: the seventh and ninth months;^d the reason for this goes back to the beginning of the world. The 'day' was then much longer, being equivalent to what is now ten months (doubtless because of the slow revolution of the sphere), then it grew shorter, and became the length of what is now seven months. Thus children, really the products of a day, retain this characteristic of the cosmic nature.^e

Breathing begins after birth. Its origin was as follows. the watery substance round the child was got rid of, and there was an influx of outer air into the open spaces of the body; then the innate heat, by its impulse outward, drove out the air, causing expiration of breath, air flowed back again to take the place of the air expelled. Thus the process was started.^f Respiration as it now occurs is caused by the reciprocal motion of blood and air in the body: breathing takes place through pores as well as nostrils, the blood, flowing to the surface of the body through tubes, drives out air, when the blood flows back, the air follows after. In the long fragment explaining this, Empedocles gives as illustration the water-clock.^g This was a vessel open at the top, and pierced with small holes at the bottom. If, says Empedocles, a girl places her hand over the top, and dips the pierced end into water, the water will not enter, because the air within repels it, but if she removes her hand, instantly the water rushes in. (This illustrates how the blood keeps out the air from the body.) Again, if there is water in the vessel, and she places her hand on the top, the water does not flow out, because no air can get in, when she lets go, the water flows out, and air flows in. (This is to illustrate how air rushes in when the blood recedes)^{h, h¹} All things have a share of breathing, and of smell.ⁱ

^a A83, A153a

^b A83

^c B70

^d B69, A83

^e A75

^f A74

^g B100, A74

^h B100

ⁱ B102

^{h¹} There seems to be some confusion here the blood recedes, and air follows it, but the water in the vessel flows *out*, and air rushes in. Doubtless this is what has caused the variant readings, ἰσθμεῖο (the pipe, or entrance) and, less common, ἡσθμεῖο (the surface pierced with holes). Burnet reads the former, but since the girl is said to have her *hand* over the pipe, this could not illustrate the retention of the water by the pressure of the outer *air*.

Blood, thus intimately connected by Empedocles with breathing, and so with life, was also considered by him to be the medium of thought: he speaks of 'the heart, nourished in the sea of blood which courses in two opposite directions' (that is, ebbs and flows), 'this is the place where is found for the most part what men call thought, for the blood around the heart is thought in mankind' ^a Blood was also the cause of milk, by the putrefaction-theory ^b And another form of blood was tears and sweat, ^c which are produced when the blood is agitated, like the whey of milk ^d It is the temporary and relative separation of heat from the blood that causes sleep, and the complete cooling that causes death ^{e, e1} Aristotle's criticism of 'those who say the soul is blood' ^f may refer to Empedocles' theory, as does the question in Plato's list 'Whether we think with the blood?' ^g The degree of intelligence depends on the composition of the blood ^h Nevertheless, all things have their share of intelligence and thought, 'even plants' ⁱ Critics pointed out that he equates intelligence and the soul, ^k and that if death means a disintegration of the elements, the soul and body die together, ^l but the whole of his religious doctrine declares the continued existence of the soul He discussed dreams, saying that they depended on the nature of the dreamer, ^m and madness, of which he distinguished two sorts, one due to a purgation of the mind, the other to its separation from the body through a physical or emotional cause. ⁿ

The soul is divine, and those who keep it pure are divine also ^o Even that which is divine, however, has a material composition. the 'long-lived gods highest in honour' are made, like everything else, by a mixing of the elements ^p No god took part in creation, ^q the elements and forces are prior to the gods. ^r Apparently, though he does not say so, they perish when Hate is completely in the ascendant, he calls them here 'long-lived', not 'immortal', ^s and he states that

^a B105 ^b B68 ^c A78 ^d A78 ^e A85 ^f A4 ^g A76

^h A97, A86 §§10, 11, B106 ⁱ B110, B102, A96 ^j A70 ^k A96

^l A85 ^m B108 ⁿ A98 ^o A12 ^p B21, B23 ^q A47

^r A40

^{e1} Aetius Further on he says that death is the separation of all the elements from which man is composed, sleep the separation of the fiery element only This is surely a mistake the separation of all the elements is the stage after death, that is, corruption.

^s But see B147

under the régime of Love there were no gods except Aphrodite.^a Love and Hate are called 'daemons',^b and Aristotle took him to mean that all the elements are 'gods',^c though one might have thought that this idea arose through his having given them the names of divinities. He calls his Sphere 'god', in his scientific poem,^d and though he speaks of 'limbs' in one place, carefully explains elsewhere that it has no limbs. In his religious poem he states that God cannot be seen or touched;^e he has no mortal shape, but is pure mind.^f This, the position of Xenophanes, does not seem to have been completely reconciled by Empedocles with his physical theory of the universe. Hippolytus in his statement that Empedocles said that there are many divine spirits, which dwell and move below the earth, seems to be thinking of the fires below the earth, and to be confusing Empedocles with Heraclitus, whose general theory about fire he goes on to attribute to Empedocles.^g

His investigations into the nature of sense-perception were detailed, and attracted much attention. His general view was that in spite of their limited powers^h we must accept their data as valid, but each must be trusted equally. The way to arrive at the truth is to compare the data of each sense.ⁱ His explanation of their functioning was the same for all: each has 'paths' into which the appropriate percept fits, and the percepts of one cannot enter the 'paths' of another.^j All objects give off effluences.^k It is a case of 'like to like',^l and in this he differed from Heraclitus and Anaxagoras, whose theory was that perception occurs between 'like and unlike', but who were unable to give an explanation of all the senses.^m

Though regarding all the senses as of equal value, he nevertheless paid most attention to sight. The structure of the eye he explained as being like that of a lantern: the inside (the pupil) is fire, and this is enclosed in delicate membranes, which are pierced everywhere with passages. The fire of the eye can pass through these paths, just as the light of the lantern can pass through the lantern-plates.ⁿ Thus far the analogy of the lantern holds; but no further, for the pupil, he tells us, is surrounded by water, which, however, cannot

^a B128 ^b A59 ^c A40 ^d B11, B29 ^e B133 ^f B134 ^g A31
^h B1 ⁱ B2 ^j A86 (*Theophrastus de sensu*) §7 ^k B89
^l B107, B109 ^m A82 §1 ⁿ B84

escape through the passages as does the fire, being finer.^a The 'mild fire' of the eye also has a small admixture of earth.^b Thus the theory of 'like to like' holds here: we see earth by means of earth, water by means of water, bright air by means of bright air, and fire by means of fire, Love by means of Love, and Hate by means of Hate.^c Theophrastus adds to this that the fire-passages are the ones through which we distinguish white, the water-pores black,^d and asks how in that case we see mixed colours.^e Aristotle's criticism of the theory is that Empedocles speaks sometimes as if sight were due to the fire in the eye shining out, and sometimes as if emanations from objects entered the pores of the eyes.^f

It seems clear that Empedocles was trying to explain the fact that we see objects at a distance, whereas smell, sound, taste and touch take place through penetration or contact. Differences in ability to see he explains by differences of admixture in the organ. Too much fire in the eye means a better ability to see by night than by day, since the fire of the day adds to the excess.^g This is true of some animals.^h Theophrastus criticizes this view severely. Aristotle suggested that if the eye were made of fire, all creatures would see in the dark,ⁱ the eye, he says, is not made of fire but of water, and Empedocles is equally wrong in saying that grey eyes have more fire, black eyes more water, so that grey eyes see badly by day, black eyes by night, through lack of fire and water respectively.^j Empedocles maintained that the best condition was a mixture, and the best mixture was an equal amount of fire and water.^k He explained the transparency of air, water and other substances by the presence of numerous passages so small as to be invisible.^l Reflections are caused by an accumulation of effluences on the surface of the mirroring object, these are densified by the fire which separates off from the mirror and carries with it the air lying in front, together with the effluences.^m He noted that one vision was produced by the two eyes,ⁿ but his explanation is not preserved. The composition of the eyes is due to Love,^o though Chance plays a part.^p

The explanation of hearing is easy: the ear, a 'fleshy shoot',^q is a kind of bell. The air is set in motion outside, it then enters

^a B84^b B85^c B109^d A82 §7, cp B94, A91^e A82 §17^f B84, A90^g A82 §8^h B95ⁱ A91^j A91^k A82 §8^l A87^m A88, B109aⁿ B88^o B86, B87^p B85^q B99

the ear and strikes it^a like the bell-clapper. Theophrastus remarks that he leaves unexplained how we hear this internal sound.^b

Smell arises from respiration.^c Particles flow from bodies, and are taken in with the air we breathe;^d this is why when breathing becomes difficult, there is also inability to smell, as in those with colds.^e The scent left behind in the tracks of animals are actual portions of their bodies.^f Smell flows most from fine light bodies.^g

On taste and touch he has nothing particular to add to the general theory that sensation arises from a fitting-in to the passages.^h He remarked on the tastelessness of water, and explained that it had in itself the different sorts of tastes, but these were imperceptible because of smallness.ⁱ

Pleasure-pain is classed with the percepts: pleasure is caused by like meeting like, pain by the meeting of opposites.^j This, Theophrastus remarks, makes pleasure and perception go together, and fails to account for the fact that perception is often accompanied by pain.^k The theory was elaborated in relation to desire, which he said arises from deficiency (as in the case of food), that is, the need of like for like, in its satisfaction, pleasure arises. Pain arises from the hostility of things of different composition.^l

He likewise classes intelligence with perception by saying that it depends on the recognition of each element by its like.^m Hence we think chiefly with the blood, because in it the elements are best mixed together. Those in whom the elements (of the blood) are mixed in equal quantity and in similar quality, not in too small or too large particles, are the most intelligent and have the most exact perceptions, those in whom the opposite obtains are the least intelligent. Those in whom the elements are in a too rarefied mixture are sluggish and slow, those in whom they are closely-packed and broken up small are quick in motion, attempting many things and completing few, because of the rapid flow of the blood. Those in whom the intermediate mixture exists in any single part are gifted in that part; that is why some are good orators, others craftsmen, because in some the right admixture is in the hands, in others in

^a A93, A82 §9^b A82 §21^c B102^d A82 §9^e A94^f B101^g A82 §9, §§21, 22^h A82 §9ⁱ A94^j A82 §9, B107^k A82 §§16, 17^l A95^m A82 §10, B107, B106

the tongue. So it is with the other abilities.^a This mechanical theory of genius was stigmatized by Theophrastus as absurd. It is not the tongue or the hands, or the admixture of blood in them, that make for the ability of these parts, it is the person who has control of the organ.^b

Theophrastus, having criticized in detail the general theory of effluences and paths, as well as its particular applications, concludes his essay by saying that 'Empedocles seems to be in error on many points'.^c This is true; but it should not detract from our admiration of the detailed observation and comprehensive thought which went into the making of the scheme. Empedocles was one of those philosophers criticized in the Hippocratic treatise *On Ancient Medicine* as having maintained that to practise medicine you must know the whole man.^d It is apparent that to him knowledge of any department of science depended on knowledge of the whole universe.

The *Katharmoi* (*Purifications*) treats of the universe in its relation to man. It is addressed primarily to the citizens of Acragas, from one who believed himself to have special knowledge^e to communicate. He begins by describing the divine honour in which he is held wherever he goes, all flock to him, some hoping to hear oracles, some desiring medical help.^f He does not, however, think it remarkable that he thus surpasses 'mortal, perishable men',^g he knows that truth is in what he says, though men are incredulous and antagonistic through envy.^h He then explains how by an 'oracle of Necessity, an ancient decree of the gods, eternal and sealed fast with broad oaths', when one of the daemons who are allotted long life pollutes his hands with bloodshed, or has followed the lead of Hate and sworn a false oath, he must wander apart from the company of the blessed for thirty thousand seasons, being born into various mortal shapes and changing one hard life for another. The elements in turn reject him. Empedocles is one of these, a fugitive from heaven and a wanderer, because he once trusted to insensate Hate.ⁱ This important fragment shows that Empedocles believed in a select class of human beings who passed through this cycle of fall, punishment and return, and did not assign it to the whole of the human race.

^a A82 §11^b A82 §24^c A82 §24^d A71^e B112^f B113^g B114^h B115ⁱ Much of this was undoubtedly Orphic, cp Chapter 1 (Orpheus) above, p. 9599

He enumerates his own incarnations, as boy, girl, bush, bird and fish,^a and refers to his weeping and wailing when newly-born and seeing 'the unfamiliar land'.^b Great was the honour, and deep the happiness from which he was exiled.^c Next follow fragments of descriptions of the exiled soul's journey to earth. A 'roofed cavern'^d is mentioned, and the 'joyless land where dwell Murder, Wrath, and tribes of other Dooms, wasting Diseases, Corruptions and works of Dissolution,^e roaming over the meadow of Disaster in the darkness'.^f There is also a land where opposites dwell, such as 'the Earth-Mother and the Sunshine-nymph, bloody Discord and Harmony with her serious mien, the Speech-nymph and the nymph of Delay, lovely Truth and dark-haired Uncertainty, Birth and Decay, Sleep and Waking, Movement and Immobility, richly-crowned Majesty and Meanness, Silence and Speech'.^g It seems that these represent the diversity of fates awaiting us in life. There is one^h who dispenses life and death,ⁱ and there is a female spirit who 'clothes the soul in the strange garment of the flesh'.^j Mortals are born with pain and travail, into a state of existence that is 'direly unblessed'.^k The best of them become, in the animal kingdom, lions, and in the tree-kingdom, laurels, the tree of Apollo.^l

Then follows a description of the world as it was under the régime of Love. There was no God of War, no Battle-din, not even Zeus, Cronos and Poseidon, but only Aphrodite.^m She was worshipped with pious gifts — painted animals and perfumes, myrrh and frankincense, and libations of honey. The altar did not run with blood of bulls, for there was no greater pollution among men than to eat the limbs of animals from whom they had reft the life.ⁿ All creatures, animals and birds, were friendly towards men, and affection glowed between them.^o

Empedocles invokes the Muse Calliopeia to help him in his exposition of 'a good theory about the gods'.^p Divine wisdom means happiness, an uncertain opinion about the gods means misery.^q We cannot bring God near so as to see and touch him,

^a B117 ^b B118 ^c B119 ^d B120 ^e B121 ^f B122, B123

^g B125 ^h B126 ⁱ B124 ^j B127 ^k B128 ^l B128 ^m B130

ⁿ B131 ^o B132

^p ἔργα τε πεύσσει. The translation is Bignone's. Diels and Burnet took it to mean 'floods', which ill suits the context.

^q The subject of this verse is unknown. Wilamowitz suggests θεοῦς or νόμος.

the usual 'highroad of Persuasion leading into the minds of men'.^a He has no mortal limbs: no arms, feet, knees or sexual organs, but is Mind and only Mind, darting through the universe with his swift thoughts^{b, b1} He ought not to be served with animal sacrifice. this is the law for all, and obtains everywhere throughout the universe.^c Animal-sacrifice is murder and cannibalism,^d it may be the slaughter of son by father, or father by son, mother by her own children, and the devouring of their flesh.^e It is better to perish than to sin by eating of this unholy feast.^f The leaves of the laurel, and the bean, must also be avoided.^g Such sins of eating debar the soul from happiness or rest.^h If they have been committed, one must confess themⁱ and repent,^j washing the hands in water from five springs,^k and fasting.^l Those who keep themselves pure throughout shall become prophets, singers, physicians and princes while still on earth, and after that shall resume their lost divinity.^m Henceforth they shall share the hearth and table of the other immortals, freed from the lot of men's griefs, safe from hurt.^{n, n1}

A comparison between the poem *On Nature* and the *Purifications* suggests the question: how far did Empedocles believe in his often-expressed theory of Chance as affecting creation, and how far in the government of the universe by an intellectual or moral force? He assigns much to Chance at the creation, the aether chanced to rush a certain way,^o creatures and objects are created by chance contact,^p and even a complicated structure like the eye, though fashioned by Love, chanced to be made as it was.^q The spine was produced by a chance turning of the neck,^r intelligence is given to all 'by the will of Chance',^s in that the rarest things fall together.^t Plato regards him as having given neither intelligence nor deity nor 'skill' (*Technê*) any part in creation, but only 'Chance and Nature'.^u But others discern the working of design and intelligent purpose in his scheme. Aristotle suggests that Love is really the cause, not of chance but of designed mixture,^v and commentators point out that the survival of the creatures created by chance depended

^a B133 ^b B134, cp B29 ^c B135 ^d B136, B138 ^e B137 ^f B139

^g B140, B141 ^h B142 ⁱ B145 ^j B139 ^k B143 ^l B144

^m B146 ⁿ B147 ^o B52 ^p B57-61, B75 ^q B85 ^r B97 ^s B102

^t B103 ^u A48 ^v A78

^{b1} This is said to apply to the Godhead, and to Apollo in particular, who was a special object of E's worship (A1 §57, A23)

ⁿ¹ These promises are Orphic see above, pp 15-17

upon a reason, that is, their capacity for self-preservation.^a A law of proportion governed the formation of bones, as Empedocles himself admits by his use of the word Harmony;^b and his analogy of the painter mixing colours likewise contains references to 'intelligence' and 'harmony' or proportion, though apparently he is concerned only to show the infinite variety of results obtainable by mixing.^c

There is, however, a law behind even the elements and forces. This is *Anankê*, Necessity, the 'Broad Oath' by which even the alternating rule of Love and Hate is fixed,^d and which decrees the exile of those who sin against heaven^e and its laws. Some thought that Necessity could be reduced to the pair Love and Hate added together,^f but it was usually recognized that Necessity must be considered a cause behind the causes, that is, a kind of predetermined plan or Fate.^g But there is opposition even to the iron rule of Fate: the Grace (*Charis*), he says, loathes intolerable Necessity.^h

The *Katharmoi* brings out even more clearly the moral significance of Love and Hate. it was by following 'mad Hate' that Empedocles fell from bliss,ⁱ and Love (*Aphrodite*) was the only goddess existing in the Golden Age.^j

EMPEDOCLES NOTES ON DOUBTFUL FRAGMENTS

Frgs 77, 78 'Trees that retain their leaves and fruit in abundance all the year round in the air' (*or*, according to the Air, i.e. how it is mixed). This is referred by Wilamowitz and Karsten to the *Katharmoi*, as being concerned, not with botany but with the ideal trees of the Land of the Blest.

Frgs 131-134, on the nature of the gods, are referred by Bignone to the poem *On Nature*.

Frgs. 148-150 'Earth that envelops mortals', said to refer to the body, 'Cloud-escorting Air', 'Full-blooded liver' quoted by Plutarch to show that Empedocles does not use epithets merely for the sake of fine writing, but in order to bring out the exact nature or function of something.

Frg 152 'Old age, the evening of life, evening, the old age of the day' A similar metaphor is said to be in Empedocles.

^a B61 ^b B96 ^c B23 ^d B30, cp A45 ^e B115 ^f A45
^g A32, cp 1 (Orpheus) B13 ^h B116 ⁱ B115 ^j B128

Frg 153 Baubo ¹ nurse of Demeter, used by Empedocles to mean Belly.

Frg 154 A passage from Plutarch, *On Eating Flesh*, may contain a quotation from Empedocles

C

The myth in the *Phaedrus* of Plato describes a theory of transmigration which contains obvious echoes of Empedocles, but the theory is reshaped to illustrate Plato's own views

32. MENESTOR

MENESTOR of SYBARIS was in his prime about the middle of the fifth century

Menestor is named in Iamblichus' list among the Pythagoreans of Sybaris,^a the only other writer who mentions him is Theophrastus, who records and sometimes criticizes some of his opinions. He devoted himself to botany, and was regarded by Theophrastus as one of the 'ancient scientists',^b but appears to be later than Empedocles, since he is said to have followed Empedocles in certain of his views.^c

He began an investigation into the constitution of plants, and the causes of their bearing or not bearing fruit,^d their different times of sprouting and fruiting,^e the shedding or not shedding of their leaves,^f their ability to tolerate their environment, climate and soil,^g their effect on, or usefulness to, man, as for example their taste,^h and their suitability for burning.ⁱ All these qualities he referred to the ratio of Hot and Cold (or Wet) in their admixture. He can thus be said to have begun an application of the Pythagorean theory of Opposites to botany. Like Alcmaeon in the physiological sphere, he believed in right mixture,^j both in the plant itself and in its relation to environment. 'hot' plants grow best in water, or rather, plants designed to grow in water have been given a naturally

^a 1 ^b 7 ^c 5 §§5, 6 ^d 5 §5 ^e 4, 5 §7 ^f 5 §7 ^g 5 §§5, 6 ^h 7

ⁱ 3, 5 §7 ^j 5 §5

¹ Baubo was of particular interest to Orphic mythology cp Ch 1 (Orpheus) B15a, and above, pp 11, 12

'hot' constitution, so that they are not destroyed by 'excess'.^a This too explains why water-plants make the best kindling.^b

He supported his views by examples,^c which included the mulberry, laurel, juniper, fir, cedar, reed, rush and ivy. He believed the ivy to be the 'hottest' in composition its heat prevents not only the loss of its leaves, but also snow from remaining on them,^d ivy makes the best tinder-wood,^e its internal heat is what makes it twist and wind,^f and its fruits are among the early-ripening.^g

His belief that plants with hot composition seek by nature to grow in water^h was said to be an application of Empedocles' similar views regarding animals, for example, fish.ⁱ Menestor appears to have referred also to the process of *Sepsis* (dissolution) as giving rise to Taste by resolving the plant-juice into its component parts,^j this too can be traced to Empedocles, who regarded digestion,^k the coagulation of milk,^l and the fermentation of wine^m as forms of *Sepsis*.

33 XUTHUS

XUTHUS, a Pythagorean, is named in Iamblichus' list.

He is mentioned by Aristotle and Simplicius as having suggested that the Whole moves with a wave-like motion.

This was offered as a solution of the dilemma (*a*) that there must be motion, because of the existence of condensation and rarefaction, (*b*) that there cannot be motion unless there is Void, as the Eleatics say. Xuthus, accepting the Eleatic position that there is no Void, suggested that even so a wave-like motion is possible, as the sea by means of its waves is able to expand and overflow the shore.

34 BOIDAS

Nothing is known of BOIDAS except that Diphilus, a lampooner, wrote a whole poem attacking him, and that no personal enmity resulted. Boidas is mentioned by the Scholiast on the *Clouds* in support of the argument that no personal enmity existed between Socrates and Aristophanes.

^a 5 §5 ^b 5 §7 ^c 5 §7 ^d 5 §6 ^e 3, 3a ^f 5 §6 ^g 5 §7 ^h 5 §5
ⁱ 31A73 ^j 7 ^k 31A77 ^l 31B68 ^m 31B31

35. THRASYALCES

THRASYALCES of THASOS was one of 'the early philosophers'.

He was a meteorologist, who believed that the rising of the Nile was due to summer rains, and that there were two chief winds, the North and the South

36 ION OF CHIOS

ION of CHIOS was active between 452 and 421 B C His first tragedy was produced in 452,^a and a reference to him in Aristophanes' *Peace* proves that he had died before 421.^b

He was a voluminous writer of tragedies, lyrics and other poems;^c he also wrote a philosophical work in prose called *Triagmos* (Triad) or *Triagmoi*. As a poet he was very successful,^d but was later regarded as polished and elegant rather than inspired.^e The fragments of his dramatic works contain nothing of philosophical interest

As a philosopher, he believed in the number Three: the elements are three, neither more nor less, namely fire, earth, air,^f the virtue of every particular creature is threefold — intelligence, strength, luck.^g Luck, though very different from wisdom, yet does a great many things like it.^h

Ion entertained an admiration for Pythagoras: he stated that Pythagoras had written verses which he ascribed to Orpheus,ⁱ and in some lines eulogizing Pherecydes, he praised Pythagoras as a penetrating judge of men's characters.^j It is therefore probable that Ion's belief in the number three was derived from the Pythagoreans.

One meteorological observation is preserved: the moon is made partly of transparent glass-like material, partly of non-radiant material.^k A doubtful fragment suggests an application of the triad-theory to music.^l

^a A₁ ^b A₂ ^c A₂, A₁ ^d A₂, A₁ ^e A₄ ^f A₆, B₁ ^g B₁
^h B₁ ⁱ B₂ ^j B₄ ^k A₇ ^l B₅

37. DAMON

DAMON (or Damonides), son of Damonides, an Athenian of the deme Oa,^a was in his prime about 460 B.C.¹

Damon is said by Plato to have been the pupil of Agathocles,^b from whom Pindar also received instruction in music, others said his teacher was Lamprocles, the pupil of Agathocles, and that Agathocles was a pupil of the Pythagorean Pythocleides, who gave instruction in 'solemn music'.^c

Damon's most important pupil was Pericles, over whom he is said to have acquired great influence, instructing him not only in music but also in politics,^d it was Damon, for instance, who was credited with having advised Pericles to make payments to jurors out of the public treasury.^e The story as related by Aristotle clearly emanates from the enemies of Pericles and his friends: the motive ascribed to Pericles for his democratic measure is that of outshining the wealthy and lavish Cimon, and to Damon is ascribed the cynical advice, 'Since your private means are insufficient, give the people what already belongs to them'.^f The anti-Periclean party was able to secure the ostracism of Damon,^g a potsherd bearing the name 'Damon son of Damonides' has actually been discovered in Athens. The date of the ostracism is conjectured as being about 445 B.C.

It is likely that Damon returned after his ten years' exile: Plato's Alcibiades is made to say that Pericles is associating with Damon 'still, at his age'.^h Damon is also said to have taught Socrates;ⁱ and to have associated with Prodicus, whose studies in synonyms interested him.^j

The outstanding feature of his teaching was the important part he assigned to music in the training of character, and therefore in the making of good citizens. He believed that the practice of music — singing or playing the harp — could not only arouse or allay different emotions,^k but also inculcate

^a A1, A6^b A2^c A2^d A3^e A6^f A6^g A4, A6^h A5ⁱ A7^j B8^k A8, B9¹ Burnet, EGP⁴, p. 255, n. 2

all the virtues — courage, self-restraint, and even justice.^a The quality of song and dance will leave its mark on the soul, for good or evil;^b and new characteristics can be created, or latent ones brought out, not only in the young but also in adults, by appropriate harmonies.^c

Music, therefore, is essential not only to a liberal education,^d but also to the common weal: he went so far as to say that no innovation in musical fashion is possible without a resulting change in the most important political institutions.^e Plato records this opinion in the *Republic*: Socrates is depicted as in full agreement with it, and Adeimantus is made to add that through music 'lawlessness creeps in unawares' in the guise of amusement, and after corrupting manners proceeds to undermine contracts, laws and constitutions, until it overturns everything, public and private.^f These views doubtless represent the teaching of Damon and his pupils.

A longer passage in the *Republic*,^g in which details are purposely left vague by Plato, hints at Damon's analysis of the components of music, such as rhythm, foot, short and long syllable: to all these, both singly and in combination, he gave a moral value. A good education will banish those elements which are akin to vice and excess, and will retain those akin to virtue and order. Plato clearly approved of Damon's teaching, he makes the general Laches commend Damon to Nicias as a teacher not only of music, but of every other subject that is worthy of pursuit by young boys.^h

Philodemus the Epicurean, a contemporary of Cicero, in his treatise on Musicⁱ implies that Damon incorporated his doctrines in an *Areopagitikos*,^j or speech purporting to be delivered to the Areopagus. But there is no other reference to anything written by Damon, and the teaching summarized in the *Republic* is quoted as remembered from a lecture. The statement in the pseudo-Plutarchian essay on music that Damon was the inventor of the 'relaxed Lydian' mode,^k can hardly be true,^l this mode was stigmatized by Plato as 'effeminate and convivial', and Damon was a believer in the Dorian mode, the mode of restraint and manly endurance.^m

^a B4 ^b A6 ^c B7 ^d B2 ^e B10 ^f *Rep* 424C ^g 400A (B9)

^h A2 ⁱ B2 ^j B5 ^k A8

^l Diels-Kranz refers all summaries of Damon's teachings to this supposed tract

^m For a discussion, see Pauly-Wissowa, Vol. IV, Part II, under *Damon*. The author, von Jan, believes that Damon was a practical as well as a philosophical musician

38. HIPPON

HIPPON of SAMOS flourished during the middle of the fifth century B.C.

Hippon, a Pythagorean, is named in Iamblichus' list with Melissus and others as a Samian;^a but he is elsewhere said to have been of Metapontium,^b or Rhegium,^c or Croton.^d This points to his having been born, like Pythagoras, at Samos, and having migrated to the south of Italy, where he practised medicine with the Pythagorean groups there. The date of his prime of life is not expressly stated, but he was satirized by Cratinus the comic poet in his *Panoptae*,^e written some time between 470 and 420 B.C.,^f and he criticized the opinions of Empedocles,^g so that he was active during the middle of the fifth century.

He published his views in several books;^h but he cannot have been very well known, since there is a doubt even about his name, which was sometimes given as Hipponax.ⁱ

Hippon is dismissed by Aristotle in the *Metaphysics* as unworthy of inclusion among those who gave Water as the substrate, 'because of the inferiority of his intellect'.^j He is grouped with Thales,^k so that there seems to be no reason for the statement that he did not specify whether by 'the Moist' he meant Water or Air.^l He said that Fire, or the Hot, was generated from Water, but subsequently overcame its begetter and so created the universe.^m Some therefore assumed that Hippon regarded the pair of opposites, Hot and Moist, as the elements,ⁿ a position in accord with Pythagoreanism; but there seems to be no doubt that he meant to place Water first, setting a higher value on conclusions based on his own observation than on the Table of Opposites.

He derived the life-principle, or soul, from Water or the cold element, as opposed to those who derived it from Fire or

^a A1, 58A ^b A1, A16 ^c A1, A3, A5, B4 ^d A11 ^e A2 ^f J1A4

^g A11 ^h A14 ⁱ A7 ^j A7, A4 ^k A6 ^l A3 ^m A3, A5

ⁿ Christ in his edn of the *Metaphysics* (Teubner 1886) regards this sentence as a marginal gloss.

^o Cratinus prob. 490-420 B.C. If Aristoph., *Nub* 94-97, is imitated from Cratinus' *Panoptae*, the latter must be earlier than 423 B.C.

the Hot, both sides called in 'etymology' to aid their views.^{a, a1} His reasons for choosing water were biological: in particular, that the semen, from which life is developed, is moist.^b The moist principle is the cause of perception, as well as of life: old men are dried up, and the soles of the feet are without sensation.^{c, c1} Excess or deficiency of moisture is also the cause of disease, but he did not specify which diseases arise from which conditions.^{d, d1}

His biological studies cover the usual subjects, but show traces of work on original lines. He was particularly interested in the processes of reproduction, and made a study of the semen. he believed that its quality (concentrated or fluid) determines the sex of the offspring,^e and that it flows from the marrow. He had apparently done experiments on animals which seemed to him to prove the latter point.^f Females eject semen no less than males, but as this falls outside the womb, it does not generate.^g He studied the period of gestation, and seems to suggest that the normal period for birth is really the seventh month, since everything for us runs in sevens, just as we lose our teeth at the age of seven, but this process can last till the tenth year, so too birth can take place in the tenth month also.^h He thought that there must be in the womb some protuberance like the breast, through which the unborn child draws nourishment.ⁱ He also discussed the formation of twins.^j He followed Alcmaeon in thinking that the brain is the seat of the mind,^k and criticized Empedocles' view that the life-principle is the blood.^l He studied the action of the heart, and was of opinion that it depended on the action of water, which checks the pericardial heat and prevents it from getting the upper hand.^m

It is thus clear that his views are in direct opposition to those of Heraclitus, to whom the moist principle is death, and it seems that we have here a trace of a violent controversy between Heraclitus and the Pythagorean medical school.

^a A10, A3 ^b A3, A10, 31A4 ^c A11 ^d A11 ^e A14 ^f A12
^g A13 ^h A16 ⁱ A17 ^j A18 ^k A15, A3 ^l 31A4 ^m A10

^{a1} Hippoν ψυχῇ and ψυχρὸς, Heraclitus ζῆν and ζεῖν

^{c1} That is, when they are dried and hardened by use dry, calloused skin is without sensation

^{d1} The theory that all disease can be traced to excess or deficiency of water in the tissues (hydraemia or anhydraemia) has been put forward recently by J. E. R. McDonagh, F.R.C.S., see his interesting *The Universe Through Medicine* (1940), and *The Nature of Disease*, Vol. II (1927), chs. I and II

The lines in the *Clouds* which satirize certain scientists who teach that 'the sky is a stove and we are the coals', is said by the scholiast to be imitated from a similar passage in Cratinus, and to refer to Hippon. This must be a mistake, it probably arises out of a confusion between Hippon and Hippasus.¹

Hippon was regarded as an atheist, both by his contemporaries and by later ages: Cratinus called him irreverent,^a and the name 'atheist' became attached to him,^b apparently because of his very materialistic outlook. he made Water the only cause of things, and believed that nothing exists except what is perceptible.^c Clement names him among a number of philosophers who were given, without deserving it, the name of atheist.^d

Only one fragment of his writings survives, quoted by a scholiast on Homer. Homer says that all rivers, seas, springs and wells have their source in Ocean, and Hippon among others supports this view, saying that all drinking water comes from the sea, because the sea is deeper than our wells; the assumption being that water rises from a lower to a higher level.

Hippon also studied botany; he said that certain attributes like floriferousness, fruitfulness, deciduousness and their opposites depend on situation and climate, but every plant if neglected becomes wild, and if cultivated improves. Theophrastus combats the latter statement, saying that whereas every plant if neglected deteriorates and becomes wild, the reverse, that everything improves by cultivation, is not true.^e

39. PHALEAS AND HIPPODAMUS

PHALEAS of CHALCEDON exact date unknown

HIPPODAMUS of MILETUS active during the middle of the fifth century B.C.

Both these men are given a place in Aristotle's *Politics* as having contributed something to political theory.

Phaleas would not otherwise be known: he is said by Aristotle^f to have been the first to put forward the idea of equal division of property.

^a A2 ^b A9, A6, B2, B3 ^c A8 ^d A8 ^e A19 ^f A1 (*Pol.* B7 1266a)

¹ Pascal, *Studi ital.* 14, 97. Diels' suggestion that only the position of the coals in the stove and not their material is meant, is surely absurd.

His scheme, designed to prevent civil strife, referred only to equal division of land, and did not deal with other forms of property such as slaves, cattle, money. He recognized that this, though easy for a new settlement, was difficult for an old-established State, and suggested that the quickest way of attaining equality was that the rich should give and the poor receive dowries. The citizens were also to enjoy equality of education.

Aristotle, while considering Phaleas' idea worthy of mention, shows that its author had not grasped the difficulties. For example, he did not decide what was the proper size of each share in itself, nor did he allow for the owners' having different numbers of children. He also failed to see that property cannot be treated purely as an internal matter by each State, but must be considered in the light of foreign relations, especially war. Further, he did not specify what form the education of the citizen was to take, and in general failed to allow for human ambition and greed.

Hippodamus was a native of Miletus,^a but lived in Athens, and also migrated to the Athenian colony of Thurii.^b He was the inventor of an entirely new system of town-planning, called by Aristotle 'the modern or Hippodamian method';^c that of wide straight streets crossing each other at right-angles, in place of the old-fashioned narrow crooked streets. His greatest work was the planning of the Peiraeus as a residential and commercial district (under Pericles), this was a natural sequence to its having been made safe by fortification, and Aristotle notes that the scheme, though an improvement from the point of view of comfort and convenience, was disadvantageous from a military point of view.^d This shows that the Athenians thought that the Peiraeus was impregnable. The market-place of the new suburb was called after the architect, 'the Hippodamian (*Agora*)',^e and his arrangement became proverbial as 'Hippodamus's partition'.^f It is conjectured that this work was done between the time of Themistocles and the Thirty Years' Peace of 446-445 B.C., traces of streets which cross at right-angles have been found in the Peiraeus itself, and also on the peninsula of Actê and the hill of Munychia.¹ There have also been found a number of inscribed

^a 1; 3, 4 ^b 3 ^c 2 ^d 2 ^e 4 ^f 3
¹ See Pauly-Wissowa, 17 Hippodamus

boundary-stones; and it has been suggested that 'Hippodamus's partition' refers to his drawing of the boundaries between the different districts of the harbour-region.

He subsequently migrated to the Athenian colony of Thurii,^a probably in 444 B.C., to assist in the laying-out of the new town. There was a tradition, mentioned by Strabo, that he was called in to plan the new city of Rhodes when in 408 B.C. the inhabitants of Ialysus, Lindus and Cameirus decided to combine,^b if this is true, he must have been about seventy years old at the time, probably older. Aristophanes in the *Knights* refers to 'Hippodamus's son',^c and the scholiast says that this was Archeptolemus of Agrylê, the politician; and that he had a house on the Peiraeus which he 'gave up to the State'. The scholiast speaks of Hippodamus as the man who first 'combined' the Peiraeus in the time of the Persian Wars, and says that his native State was variously given as Thurii, Samos and Miletus.^d The date is probably mistaken, but there is no need to doubt that Archeptolemus was Hippodamus's son, and this gives us 475 B.C. as the latest possible date of Hippodamus's birth.^e It also suggests that Hippodamus was granted Athenian citizenship, since his son had a political career.

Hippodamus's eccentricity of dress made an impression on the Athenians. Aristotle says that he wore long hair and valuable jewellery, but his clothes were of the meanest 'even in summer'. Perhaps he had picked up these fashions in Thurii, and returned to Athens later. The 'Thurian seers' are satirized by Aristophanes in the *Clouds*, among the 'sophists, quacks, beringed and long-haired idlers',^f and elsewhere we learn that the Thurians wore their hair long like Spartans.^g Aristotle says that Hippodamus wished to be learned in the whole of natural science, so that the Athenians may have regarded him as one of the Sophists.^h The lexicographers call him a meteorologist.^b

^a J
^g I

^b J
^h 3

^c *Eq* 327

^d 4

^e *Nub* 332

^f Philostr *V Ap* 3, 15

¹ Pauly-Wissowa, s. v. Hippodamus. The *Knights* was produced in 425-424 B.C. Archeptolemus must have been at least thirty to be engaged in politics. Probably older. Therefore Hippodamus must have been born not later than 475 B.C. But even if we place his birth during the Persian Wars, say in 485 B.C., he would still have been under 80 at the foundation of the new Rhodes, and could have planned and even supervised it. Callias, son of Hipponicus, went to Sparta as an envoy at eighty, to quote only one instance of vigorous old age.

It was however as an amateur political theorist that he interested Aristotle. he was the first man not actively engaged in politics to attempt to frame an ideal constitution. His provisions were: the best number for the population of a city-state was ten thousand males, divided into three classes — artisans, farmers, soldiers. The land also was to be divided into three: sacred, for the provision of religious dues, public, for the maintenance of the army; private, to be cultivated by the farmers. The legal code likewise was to be divided into three: assault, damage, homicide. There was to be a central court of appeal, composed of elderly men chosen by election. The verdict of the ordinary courts was not to be given by voting for absolute acquittal or condemnation, but each juryman was to have a tablet on which he recorded his decision on each separate charge. Magistrates were to be chosen by election, and were to have jurisdiction in matters concerning the State, foreigners and orphans.

It is obvious that the suggestions concerning jurisdiction owed their origin to his critical observation of the Athenian legal system. The insistence on the number three in his ideal constitution gave rise to the supposition that he was a Pythagorean, or even a Samian^a like Pythagoras, he was said to have dedicated a book *On Virtue* to Theano, the wife of Pythagoras,^b and a passage from a book *On Political Constitution* purporting to be by Hippodamus was quoted.^c The latter is now generally regarded as a Neo-Pythagorean forgery based on the information given by Aristotle in the *Politics*.

40 POLYCLEITUS

POLYCLEITUS of ARGOS was active during the latter half of the fifth century.

Polycleitus of Argos (perhaps originally of Sicyon)^d was recognized by his contemporaries,^e no less than by later generations, as supreme in the art of sculpture, particularly of the human form. He wrote a treatise called the *Canon*,^f in which he stated his guiding aesthetic principle — that physical beauty

^a 4^b Suid. s.v. Theano^c Stob. IV, 1 (Diels p. 390, n.)^d A2^e A1, cp. Xen. *Mem.* I, iv, 3^f A2, A3

depends upon the correct relation of the parts of the body to one another.^a This theory, acceptable to both medicine and philosophy, was given concrete expression by him in a statue which was also called the Canon, and which was resorted to by later artists as the final word on the symmetry of the human form.^b

Of his treatise, two sentences survive: one, that the right result comes by small stages, 'through many numbers',^c is quoted by Philo the Engineer to explain why artists sometimes go wrong without knowing where, and seems to be based, like his theory of symmetry, on the Pythagorean doctrine of Number. The other sentence,^d quoted twice by Plutarch, embodies a proverbial expression, the exact meaning of which is not certain. but the most likely rendering is 'The artist's work reaches its most difficult stage when the modelling clay is within a nail's breadth' of what he wishes to represent.

41 OENOPIDES

OENOPIDES of CHIOS was active during the latter half of the fifth century

Testimony regarding Oenopides' date varies: some said that he was a little younger than Anaxagoras,^e others that he was known towards the end of the Peloponnesian War.^f Nothing is known of his life. He was said, like other scientists, to have visited Egypt,^g and there is a hint that he taught at one time in Athens. His name is frequently mentioned with that of Pythagoras; but it seems unlikely that he was a Pythagorean, since he was accused of stealing Pythagoras's ideas.^h Only one story has attached itself to him. seeing an uneducated youth who possessed a large number of books, he said 'Not with the (book-) box, but with the heart'.ⁱ

He was a mathematician and astronomer, apparently studying mathematics principally with a view to astronomy.^j He studied the sun's orbit, and was said by Eudemus to have discovered the Zodiac, others said that he stole this idea from Pythagoras, others that he learnt of the obliquity of the sun's

^a A₂^b A₂, cp Ael *V H* xiv, 8, and Cic *Brut* 86^c B₂^d B₁^e 1^f 1a^g 7^h 7ⁱ 4^j 13

orbit from the Egyptian priests.^a He believed that the sun had originally followed the Milky Way, but had later given it up for the zodiacal path, another idea borrowed from the Pythagoreans and apparently found originally in mythology.^{b, b1}

He said that the length of the Great Year (that is, the number of years it takes for astronomical phenomena to repeat themselves) was fifty-nine years, and he set up a tablet at Olympia recording this opinion, in which he was in agreement with Pythagoras.^c He reckoned the solar year as 365 days and 'a fifty-ninth part of twenty-two days',^{d, d1} that is, nearly nine hours.

His mathematical discoveries are said to have included two problems. 'To draw a straight line perpendicular to a given straight line of unlimited length, from a given point outside it',^e and 'At a given point in a given straight line, to make an angle equal to a given angle'.^f A line of mathematicians followed his tradition.^g

He had an ingenious though mistaken theory on the flooding of the Nile in summer the waters below the earth are hot in winter, cold in summer, this can be seen from deep wells, the water of which is cool in the hot season, but remains unfrozen in winter. The Nile waters therefore diminish in winter, owing to the heat below, but in summer, when this cause is not operating, they fill their channel without hindrance.^h It is perhaps permissible to conjecture that the observation of deep wells had been suggested to him by his compatriot Hippon.ⁱ

He said that Fire and Air are the elements;^j and the Stoics found in him a warrant for the belief that the World-Soul is God.^k

^a 7, cp 12A5 ^b 10 ^c 9 ^d 8 ^e 13 (Euclid, *Propn* 12, *Probl* 7)

^f 14 (Eucl *Propn* 23, *Probl* 9) ^g 12,3 ^h 11 ⁱ 38B1 ^j 5 ^k 6

^{b1} The discovery of the Zodiac was also attributed to Cleostratus. See Chapter 6,

pp 34, 35 above

^{d1} Modern astronomy reckons it as 365 days, 5 hours, 48 minutes, 46 seconds

42 HIPPOCRATES OF CHIOS. AESCHYLUS

HIPPOCRATES of CHIOS flourished during the latter half of the fifth century

AESCHYLUS was his pupil.

Hippocrates of Chios is spoken of as the successor in geometrical studies of Oenopides, and the contemporary of Theodorus, Plato's teacher ^a This places his prime about the year 430 B C That he was a generation earlier than Plato is also suggested by the legends surrounding the problem of the duplication of the cube, namely that this first arose as a mere problem of stage scenery; then came Hippocrates' formula; then it became the 'Delian problem' when the people of Délos asked their oracle how to stop an epidemic, and being told to double the altar of Apollo without altering its form (a cube), applied to the Academy for help ^b

Hippocrates was at first engaged in commerce, but suffered a loss of his fortune, and took up geometry. Some said that he was cheated of his money by Byzantine customs-collectors, a story repeated by Aristotle^c to show that a man stupid in some respects can be able in others in other words, that theoretical and practical ability do not always go together, a favourite moral with Greek anecdotists A more highly-coloured version was that he was robbed by pirates, and came to Athens to seek redress; but the law's delays gave him time to attend philosophical lectures, which was the beginning of his career as a geometer ^d This story arises from the desire to preach that an apparent disaster can turn out to be the greatest of blessings

He was accused of having betrayed Pythagorean secrets; but this charge was made against so many that it carries little weight, especially as a different version was that one of the Pythagoreans had been given permission to teach geometry so that he could repair a loss of fortune ^e There is no need to suppose even that Hippocrates was a Pythagorean, though of course he knew their mathematical and astronomical work.^f

^a 1^b Eratosth *Epist ad Ptol*^c 2^d 2^e Iambl *V P* 88 (Diels, *Vors* ch 18 (Hippasus) 4)^f 5

Hippocrates was the first to write a text-book of mathematics, the *Elements*, this, like all pre-Euclidean text-books, is lost. But an important passage from it, with later additions, is preserved by Simplicius in his *Commentary on the Physics of Aristotle*.^a Simplicius drew this material from Eudemus' *History of Geometry*, also lost; and he added references to the *Elements* of Euclid, who lived a century and a half later than Hippocrates. Nevertheless, this passage contains the actual proofs of Hippocrates, and therefore embodies the oldest existing fragment of Greek geometry. Aristotle knew Hippocrates' book, and made critical comments on his discoveries.

Hippocrates was the first to discover how to 'square' (that is, find the rectilineal equivalent, or area of) certain types of lunes (that is, *curvilinear figures formed by the intersection of the circumference of a circle by the arc of another circle*) His demonstration of the squaring of the lunes is given by Simplicius.¹ The problem was treated as a step towards the 'squaring of the circle', one of the great unsolved problems of the day.^b

He was accused by Aristotle of a fallacy in this connection, though one which was in accordance with the principles of the science, and therefore capable of geometrical refutation.^c It is not agreed^d what exactly this was, or even if Aristotle was justified in his accusation; but the most likely conjecture seems to be that the supposed fallacy was the belief that he had squared all possible lunes, whereas he had squared only one particular lune of each of the three possible types — those which have for their outer circumference either a semicircle, or an arc greater than a semicircle, or an arc less than a semicircle,^d and that this mistake led him to suppose that he had succeeded in squaring the circle itself

He also advanced the problem of the duplication of the cube by finding a formula containing two unknown quantities which

^a 68, 32 ^b 3 ^c 3 ^d 3

¹ For translation and detailed commentary with diagrams, see Heath, *Greek Mathematics*, Vol. I, pp. 183 sqq., also Allman, *Greek Geometry from Thales to Euclid*, pp. 57, sqq., and Pauly-Wissowa, *Real-Encyclopädie*, s.v. Hippocrates (14)

² Heath (*Gk Mathr.*, p. 197 n.) thinks that Hippocrates made no such mistake, but was assumed to have done so, an assumption to which he rendered himself liable by not clearly stating the limits of his discovery. Björnbo (Pauly-Wissowa, p. 1796) holds the strange view that Hippocrates knew the limitation of his work, but was practising a deliberate deception in pretending that it solved the squaring of the circle

if discovered would give the solution.^{a, 41} This seemed to some a referring of the problem to a still more difficult problem,^b but to others it seemed a valuable demonstration of the method of reduction,^c that is, resolving a problem into its elements and clearly indicating where the unsolved factors lay.

He also contributed to astronomical speculations: the school which derived from him and from his pupil Aeschylus accepted the Pythagorean theory regarding comets, that they consisted of a single planet appearing to us at long intervals only, like the planet Mercury, because it rises only a little way above the horizon and therefore makes many appearances which are invisible. They added to this that the comet's 'tail' is not of itself, but is due to the moist exhalations which at times it collects and carries with it, and by which our vision of the sun is refracted, so that we see a reflection of the sun in another place, as in a mirror. They gave detailed explanations of the comet's occasional appearance, and of its having or not having a tail.^d A similar explanation was offered of the Milky Way^e that it was a mirage of the sun's light.^{e, 41}

43. THEODORUS

THEODORUS of CYRENE. latter half of the fifth century.

Theodorus was a generation older than Plato, and younger than Oenopides.^f He was a Pythagorean;^g a great friend of Protagoras,^h and one of Plato's teachers.ⁱ He appears as a speaker in Plato's dialogues *Theaetetus*, *Sophistes*, and *Politicus*.

^a 4 ^b 4 ^c Proclus, *Comm. in Eucl.* 212, 24 sqq. ^d 5 ^e 6 ^f 1 ^g 2
^h 4 ⁱ 3

^{a1} This formula was 'the finding of two mean proportionals between two lines, the greater of which is twice the length of the less'. Hence

If a be the length of the side of a given cube
and x be the length of the side of the duplicated cube,
and y an unknown quantity such that
 $a : x = x : y = y : 2a$ (the above formula)

then since

$$\frac{a}{x} = \frac{x}{y} = \frac{y}{2a},$$

$$ay = x^2 \text{ and } y^2 = 2ax \text{ and } xy = 2a^2$$

$$\text{Therefore } x^3y = 2a^3y, \text{ or } x^3 = 2a^3$$

See Heiberg, *Mathematics and Physical Science in Classical Antiquity* (The World's Manuals), p. 28

^{e1} Heath, *Aristarchus of Samos*, fails to understand the expression 'refraction of our sight towards the sun' because he takes the Sun to be the mirror and the thing seen to be the Milky Way, which makes nonsense of the passage (p. 247)

He was principally eminent as a mathematician; but these studies were applied by him to astronomy and music. In the *Theaetetus* he is depicted as having given a demonstration on square roots: he showed that the square roots of certain numbers are incommensurable, starting with 3 and 5, and taking each number until he reached 17. He then divided numbers into two classes, according to whether they could or could not be produced by the multiplication of equal numbers, the former he called 'square' numbers, the latter 'oblong', comparing them to square and oblong rectangles. He pursued this distinction into solid geometry.^a

44 PHILOLAUS

PHILOLAUS of TARENTUM was active in the latter half of the fifth century

Philolaus was a Pythagorean of Southern Italy. He is usually called a Tarentine,^b but it is not known whether he was a native of Tarentum or merely settled there later as a member of the Pythagorean group. His teacher was Lysis, one of the two who escaped the massacre at Croton.^c Tradition sometimes made Philolaus a coeval of Lysis, and fellow-refugee from Croton,^d but this is unlikely. The probability is that he was brought up with the Pythagoreans who escaped the results of Croton, and received instruction when young from Lysis. Lysis then migrated to Thebes and became the tutor of Epameinondas.^e Lysis died and was buried there, and eventually Philolaus migrated to Thebes, perhaps, as tradition said, to do homage to Lysis' tomb, but more probably by invitation from the Thebans. He had taught Simmias and Cebes, the young Thebans of the *Phaedo*, but had left Thebes before the date at which they are depicted as speaking (399 B C).^f

He apparently returned to Italy, probably to Tarentum. Archytas, who became ruler of Tarentum, was his pupil,^g and there was a tradition that Philolaus was put to death for aiming at tyranny;^h this no doubt arose from his connection with Archytas. The last generation of Pythagoreans included a

^a 4 (*Theaet* 145c 199)^b A₃, A₄; A_{4a}, A₆^c 14 (Pyth) 16^d A_{4a}, cp A_{1a}^e A_{1a}^f A₃^g A₁^h But see above, p 78, note 1, and below, p 233, note 1.

number of Philolaus' pupils. Aristoxenus, himself a Tarentine, knew some of these. Xenophilus of Chalcidice, and four men from Phliûs — Phanton, Echecrates, Diocles and Polymnastus ^a Apollodorus mentions Democritus among the associates of Philolaus.^b Some said that Plato, when he went on his travels at the age of twenty-eight, heard Philolaus lecture;^c but the various traditions regarding the way that Plato acquired the Pythagorean books imply that he did not meet Philolaus.

Philolaus was said to have written one book,^d which was the first account of Pythagoreanism ^e There is no suggestion that he was excommunicated from the brotherhood for so doing, on the contrary, he may have been the member who was given permission to repair his damaged fortunes by this means.^f According to one account, Plato bought this book from Philolaus' relatives for a large sum, and copied out his *Timaeus* from it,^g another version was that Plato got this knowledge orally from a young pupil of Philolaus who had been arrested by Dionysius' bodyguard. Yet another version said that Plato sent to Dion in Sicily a request to buy 'three Pythagorean books' from Philolaus ^h These three books were much talked-of. They were ascribed to Pythagoras, they were given titles, their different portions were assigned to various other Pythagoreans — Hippasus, Philolaus' teacher Lysis, and others ⁱ In later times, a work called *The Bacchae* was ascribed to Philolaus,^j whether this is another name for the 'one book' ascribed to him by Diogenes Laertius, or a different work, is uncertain.

It seems clear, however, that Philolaus did commit Pythagorean doctrine to writing, and that it was from his book or books that Plato derived his intimate knowledge of Pythagorean thought. The writings continued in the possession of the Academy, and Speusippus, who succeeded Plato as head of the school, was able to put together a 'neat monograph' entitled *On the Pythagorean Numbers*, which was mostly drawn from Philolaus.^k

Whether the fragments quoted by late authorities as being from Philolaus' book are genuine has been much discussed.^l The opinions of modern scholars have ranged from acceptance to rejection of them all. I have therefore thought it best to

^a A4 ^b A2 ^c A5 ^d A1 ^e A8, 14 (Pyth) 17, 31 A1 §55

^f 14 (Pyth) 17 ^g A1, A8 ^h A1, 14 (Pyth) 17 ⁱ 14 (Pyth) 19

^j B17-19 ^k A13

^l The reasons for suspecting forgery are given in Burnet, EGP⁴, pp. 279-299

summarize first the tradition regarding Philolaus' doctrines, and second the contents of the disputed fragments

Tradition credits Philolaus with having taught the Pythagorean doctrine of Number, both mathematical and mystical. Firstly, the universe is a composition of opposites, namely the Limit and the Unlimited,^a so that geometry, which studies this subject, is the basis of all science.^b The most perfect number is the Decad, or Principle of Ten-ness: it is most akin to nature, so that all men, whatever their nationality, instinctively go thus far in their counting,^c and it has arithmetical properties which distinguish it. For instance, it is the first to 'contain' the same number of primes and composites.^{d, d1} Again, it is the sum of the first four numbers 1, 2, 3, 4 (which the Pythagoreans called the *Tetractys*, and used as their greatest oath).^e This being so, the Decad contains in itself the nature of point, line, plane and solid, for the point is 'one', the line is 'two', the triangle (the first plane figure) is 'three', and the pyramid or tetrahedron (the first solid) is four. Again, to take the pyramid: it has four plane surfaces, six edges, which again gives the number ten. One thus finds the Decad at the basis of geometry, and the latter half of Speusippus' book on *Pythagorean Numbers* was devoted to an explanation of its properties.^f

The first half of Speusippus' book dealt with 'linear polygons, all the plane and solid figures, and the five figures which are assigned to the cosmic elements, their individual characteristics and relations to one another'.^g The 'five figures' are the cube, pyramid (tetrahedron), octahedron, eicosahedron and dodecahedron, and the 'cosmic elements' are Earth, Fire, Air and Water. The theory that the Earth-atom is a cube, the Fire-atom a pyramid, the Water-atom an eicosahedron, the Air-atom an octahedron, and that the dodecahedron is the figure enclosing the whole Cosmos, is expounded in detail in Plato's *Timaeus*,^h but it is ascribed by Aetius (drawing on Theophrastus) to Pythagoras himself, and one of the disputed fragments of Philolaus hints at it.ⁱ The question therefore arises, did Plato borrow this from the Pythagoreans, or did he

^a A9 ^b A7a ^c A13 (p 401, l 1) ^d A13 (p 401, l 7) ^e A11

^f A13 ^g A13 (p 400, l 26) ^h *Tim* 55D 399 ⁱ B12

^{d1} That is, the series of numbers ending with ten contains an equal number of primes (1, 2, 3, 5, 7) and composites (4, 6, 8, 9, 10). This appears to be the earliest distinction between prime and composite numbers (Heath, *Gk Maths*, Vol I, p 72)

invent it, and was its later ascription to Pythagoras or Philolaus merely an attempt to substantiate the absurd idea¹ that the *Timaeus* was a transcription of the mysterious Pythagorean books². The Pythagoreans doubtless knew of the five regular solids, though they may not have perfected the construction of the octahedron and icosahedron, which were said to have been first 'discovered' by Theaetetus³. They were also interested in the Four Elements, on which attention had been focussed by Empedocles. It is therefore possible that Plato was taking over a Pythagorean suggestion, and that he may have found this in Philolaus' book, but by using it as he does, namely to explain how one element can 'change' into another, he lifts it out of the realm of Pythagoreanism into the Platonic scheme.

On the other hand, the theory in the *Timaeus* certainly looks like a correction of Democritus, who gave his atoms various shapes chosen at random, whereas Plato would restrict these shapes — for reasons which he explains — to the five regular solids; and though this is put into the mouth of Timaeus, who speaks authoritatively, the view that Timaeus is expressing the doctrines of fifth-century Pythagoreanism cannot be said to have been proved,⁴ so that it is possible that the connection between the particles of the Four Elements and the Five Solids may have been suggested first by Plato⁵. This question cannot be further discussed here, and Philolaus' part, if any, in transmitting such a theory or its ingredients must therefore be left undetermined.

We are also told that Philolaus' view of the cube as the 'geometrical harmony' led to the adoption of the term 'harmonic mean' by the Pythagoreans. The cube has 12 edges, 8 angles, and 6 faces, and 8 is the mean between 12 and 6 according to the harmonic proportion. Thus since every cube, itself a 'harmony' of three equal sides multiplied, exhibits this type of proportion, the latter was called 'harmonic'^{b, b1}.

^a Schol. in *Eucl.* XIII

^b A24

^{b1} The change of name to 'harmonic' from 'sub-contrary' is elsewhere attributed to Hippasus and Archytas. For a description of the three 'means', see under Archytas, ch. 47, pp. 235-36, also Heath, *Gk. Maths.*, Vol. I, p. 85.

¹ See Cornford, *Plato's Cosmology* (Introd.) p. 3

² Cornford, *Plato's Cosmology*, Preface, pp. viii sqq., refuting A. E. Taylor. Cp. Burnet *EGP*⁴, pp. 279 sqq.

³ If the curious reader wishes to see the depths to which, in modern times, anti-Platonic misrepresentation can go, let him consult Hogben, *Mathematics for the Million*, pp. 22 sqq.

A mass of mystical lore on numbers was also transmitted by Philolaus. The *Tetractys*,^a the triangle formed from the first four numbers, not only served as the Pythagorean oath, but was also the 'first principle of health'. It completes the perfect number Ten; and this number can be called Faith itself, because in it we have sure grounds for faith in the world of existing things. Thus it could be called Memory by those who give this title to the Monad.¹ After one passes Four, which expresses the Solid in mathematics, other mystical equations are reached: the number Five gives rise to Quality and Colour, Six gives the Life-Principle, Seven gives Intelligence, Health and Light, Eight gives Love, Friendship, Cleverness and Purpose.^b

It seems that all were not agreed about these equations elsewhere. Ten is said to give the Health-Principle; and obviously no very strict rules could be drawn up in a matter so controversial, unless the Master himself had spoken. It is therefore possible that Pythagoras is not responsible for these elaborations of the theory that everything has its natural Number, and this is borne out by a passage in Proclus, in which we are told that 'the Pythagoreans' dedicated different angles to different gods. Philolaus, for example, consecrated the angle of the triangle to some deities, the angle of the quadrangle to others, and that the same angle was assigned to different gods, and different angles to the same god, according to their different properties. He dedicated the angle of the triangle to four gods. Cronos, Hades, Ares and Dionysus, because Cronos governs Wet-Cold, Ares Fire, Hades life below Earth (and so Earth) and Dionysus the Wet-Hot (wine). The angle of the quadrangle he dedicates to Rhea, Demeter and Hestia, and that of the dodecahedron to Zeus, as enclosing them all.^{c, 1} Another authority says that Philolaus assigned semicircles to the Dioskouroi, the triangle to Athena, the quadrangle to

^a^b A 12^c A 14

¹ Procl. in *Eucl.* p. 130, 8. If this passage really gives pre-Platonic Pythagorean thought, it is the source of Plato's 'atomic' theory for the triangle (as Plato explains in *Timaeus*) gives the construction of the 5 solids, the elements, being composed of these can be resolved into triangles, which accounts for their being able to 'change' into one another. But its resemblance to *Timaeus* makes it suspect.

¹ That is, the Monad was usually called Memory, but the Decad, which gives a steady basis for our knowledge, is equally deserving of the title.

Hermes, and going still further in subdivision, different angles of the quadrangle to Rhea, Hera and so on respectively. Again, Plutarch, drawing on Eudoxus, says they gave the angle of the triangle to Hades, Dionysus, Ares (not seeing the connection between this and the theory of the elements and regular solids, he leaves out Cronos); the angle of the quadrangle to Rhea, Aphrodite, Demeter, Hestia, Hera; the dodecahedron to Zeus; and (a new member) the 56-sided figure (*Hekkaipentecontahedron*) to Typho.^a

Philolaus was also credited with transmitting the Pythagorean cosmology.^{b, b1} This remarkable scheme places Fire in the middle of the universe, like a hearth, and therefore in the most sacred position, 'the House of Zeus, the Mother of the Gods, the altar, binding-force and measure of Nature'. In this central Fire resides the governing principle, placed there by God the Creator^{c, c1}. On the outside (uppermost region) of the universe, forming a periphery, is another Fire, but the central Fire is the original one. Round it circle, as in a choric dance, ten divine bodies starting on the outside of the sphere, we have the circle of the fixed stars, then the five planets, then the sun, then the moon, then the earth, and lastly, between earth and the central fire, a body called Antichthon, Counter-Earth. This body travels 'opposite' Earth, that is, between it and the central fire, it is inhabited, but the two races never see each other because the face of Earth is always turned 'outward', that is, away from the central fire and towards the other planets.

The peripheral region, where are the elements in their purity, he called Olympus, the regions containing the five planets, the sun and the moon, he called Cosmos, and the region below the moon, in which Earth moves — the region of change — he called Heavens. Knowledge is concerned with the regions of the upper bodies, those beyond earth, where all is order, virtue is concerned with the world of change, where all is disorder.^d The Earth, accompanied always by Counter-Earth, circles round the central fire in the same direction as the

^a A14

^b A16, A17

^c A17

^d A16

^{b1} Aristotle ascribes it to 'the so-called Pythagoreans,' Aetius (drawing on Theophrastus) to Philolaus

^{c1} This sentence from Aetius is puzzling 'The ruling principle is the midmost fire, which the Creator placed beneath the (sphere) of the Whole like a keel' (τῷ πᾶσι δίκην). It is difficult to reconcile the idea of a keel placed beneath a ship with that of a central fire round which everything revolves. Cp B12, and below, p. 231, note 1

sun and moon, but in a different plane.^a The sun is transparent like a lens, receiving the rays from the (outer) universe, and transmitting their light and heat to us, so that there are two 'suns', the fiery element of the heavens (that is, the periphery or outer Aether) and the fiery lens, or perhaps one should speak of the rays disseminated by this lens as the 'sun' we see, making yet a third, an 'image of an image'.^{b, b1} The moon looks earth-like because it is inhabited all over, like our earth, with animals and plants bigger and more beautiful than ours: the animals on the moon are fifteen times stronger than those on earth because they suffer no loss by excretion; and the moon-day is fifteen times longer than the earth-day, that is, the moon enjoys the light of the sun for exactly half the time it takes to revolve round the central fire (a lunar month), whereas Earth (with Counter-Earth) is revolving round the Central Fire once every twenty-four hours.^{c, c1} The sun takes a solar year, and the planets take each their appointed times; the circle of the fixed stars scarcely moves at all.^d

The solar year, according to Philolaus, is $364\frac{1}{2}$ days. The Great Year, at which all astronomical phenomena begin to repeat themselves, he reckoned at 59 years, with 21 intercalary months.^d This is a variation on the figures given by Oenopides, made apparently in order to make the number of months in the Great Year equal the cube of 9.^e The credit for being the first to say that the Earth revolved was sometimes given to Philolaus,^e the view was not shared by all Pythagoreans, some of whom thought that Earth did not move.^f

This cosmological system is an endeavour to fit the observed

^a A 21 ^b A 19, and Achill *Isag. in Phaen.*, Diels, *Dox. Gr.*, pp. 349, 350

^c A 22 ^d A 22 ^e A 1 ^f A 21

^{b1} The meaning of this passage has been much discussed. See Heath, *Aristarchus*, pp. 116 sqq.

^{c1} Athenaeus II, 15 records a further conjecture regarding the inhabitants of the moon that the women are oviparous. This comes originally from the same source, for the statement follows that the offspring are 15 times the size of ourselves. Diels, *Vors. I*, p. 404, n.

^d See Heath, *Aristarchus*, pp. 103 sqq., for a discussion of the motion of the fixed stars according to Philolaus' scheme.

^e Heath, *Aristarchus*, p. 102. 59 years with 21 intercalary months = 729, which = 9^3 , reckoning $29\frac{1}{2}$ days to a month, the solar year then has $364\frac{1}{2}$ days. Oenopides gave the days per solar year as 365 (+ a fraction, $\frac{2}{3}$) which makes the number of months in a Great Year = 730. Philolaus apparently subtracted 1 from this figure to get the desired cube of 9, and was obliged to give his solar year only $364\frac{1}{2}$ days. This was first noticed by Tannery.

phenomena of the skies into a perfect mathematical scheme, according to Pythagorean ideas. Its most interesting feature, in the light of modern knowledge, is its removal of the earth from the centre of the system, and the giving of that place to the Central Fire, round which the earth revolves. But the Central Fire is not identified with the sun, and does not even supply the sun with its light and heat, and though, like Heraclitus' Fire, it is the seat of the government of the universe, it seems otherwise otiose, especially to the inhabitants of Earth, from whom it is screened by Counter-Earth. Again, the insertion of Counter-Earth puzzled ancient commentators: Aristotle says in one place that this was done merely to bring the number of the orbits to the perfect number Ten.^a Elsewhere he suggests that Counter-Earth was inserted to explain the comparative frequency of lunar eclipses,^b but since Counter-Earth revolves nearest the Central Fire and is always 'opposite' Earth, this seems unnecessary. A more plausible explanation is perhaps that Counter-Earth was invented to screen Earth from the Central Fire; also, it may have been asked why we do not see the Central Fire, or even its rays passing us into the farther heavens. The answer to the first question may have been that there are no inhabitants on that side of Earth, but the answer to the second can only have been that there was something in between ourselves and the Central Fire. In short, one arbitrary assumption may have led to another. But the theory of Counter-Earth as a separate body, and of the Central Fire itself, was felt to be unsatisfactory even by members of the Pythagorean school. There were some, whom Simplicius says represent a more genuine doctrine than that criticized by Aristotle, who did away with both by saying that the Central Fire was at the centre of the earth, whence it gives life to all and warms that part which has cooled down. The name 'Counter-Earth' they gave to the moon, which they also called 'The Earth in the Aether'.^c It follows that these had to account for day and night, not by a diurnal revolution of Earth round a Central Fire, but by a rotation of Earth on its axis. This theory was actually reached, and is associated with the names of Ecphantus and Hicetas.^d

^a 58B4, cp 58B37^b 58B36^c 58B37^d Chs 50 and 51, p 241 below

Philolaus experimented also on the relation of Number and Sound. A late authority (Boethius)^a credits him with an attempt to divide the tone in music according to a mathematical scheme: he treated the tone as represented by the cube of the first odd number, that is, 27 (3³), and then divided it into two slightly unequal parts, the part less than half he called *Apotomé*, and the part greater than half he called *Diesis*, and the difference between them he called *Comma*. These divisions were supported by arbitrary analogies with geometry; but they show that he recognized the existence of 'semi'-tones of unequal value, and attempted to relate them numerically. It is also clear that he recognized, and gave fixed values to, certain intervals which are less than the semitone^b. He called the intervals 'excesses', a mathematical term much used by the Pythagoreans^{c, c1}.

His physiological views were^d the body is made of the hot element only, it has no admixture of cold until after its birth, when it breathes in air, and expels it, thus cooling itself. Disease is due to bile, blood and phlegm. Phlegm is a hot element, not cold, as others said, but the cause of fever^e. Bile does not reside in the liver, but is a 'fluid of the flesh',^f it hardly exists at all, or is useless^g. Blood is congested when the flesh is compressed within, rarefied when the vessels are distended. These remarks, though they do not carry the science of medicine any further, are based on observation of certain diseases or injuries.

The fragments attributed to Philolaus are, with one exception,^h quoted by late authorities, principally Stobaeus, who mentions a book *On the Cosmos*, and another called *Bacchae*. Proclus on Euclid also mentions the *Bacchae*. There are also quotations in the mathematical writers: the Pythagorean Nicomachus of Gerasa (c. A.D. 100) and Iamblichus' commentary on his book, Theo of Smyrna (c. A.D. 125), and in the work called *Divine Properties of Numbers*,ⁱ of unknown authorship. These fragments are all in the Doric dialect, and therefore in Philolaus' native tongue, if he was a native of Tarentum,

^a A26^b B6^c A25, cp. Ch. 46, 4 (below, p. 233)^d A27^e A28^f B16^g ὑπεροχή^h He was perhaps trying to make this term cover pus as well as phlegmⁱ He appears to be referring to lymph^j Θεολογούμενα ἀριθμητικῆς. See Heath, *Gk. Maths.*, Vol. I, p. 97

but it has been made the chief ground for doubting their genuineness, by those who reject them all,¹ the argument being that until the time of the Peloponnesian War, Ionic was the dialect of science and philosophy. Another argument is that there is nothing in Plato or Aristotle to suggest that Philolaus contributed anything important to Pythagorean science; Aristotle in particular almost always speaks of 'the Pythagoreans', or 'the so-called Pythagoreans'. Nevertheless, it is not impossible that Philolaus was a Tarentine, and chose to write his views in 'common Doric' instead of 'common Ionic', perhaps because he wished to reach a different audience, whatever may have happened afterwards, there is no need to suppose that he wrote for Athenians. Aristotle's silence proves nothing, since he regarded Pythagorean doctrine as the work of a group, and may have treated Philolaus' account as being on the whole a record rather than an original work, he does in one place quote Philolaus' own words. The fragments themselves are clearly and simply written, and in places (like the summaries) show a divergence from the general Pythagorean point of view that would surely have been avoided by a forger.

Fragment 16, from the *Eudemian Ethics* of Aristotle, is generally accepted, Fragment 20 is regarded as doubtful because it exalts the number Seven to the place which Philolaus elsewhere gives to Ten. Fragment 21 is generally rejected as post-Platonic and borrowed from *Timaeus*.

According to Diogenes Laertius, the first sentence of Philolaus' book *On the Cosmos* or *On Nature* stated that everything was a conjunction of That-Which-Limits and the Without-Limit, both the whole universe and all things it contained.^a A proof of this (quoted by Stobaeus) followed logically, things must be made of That-Which-Limits, or the Without-Limit, or both. They cannot all be Limiting, or all Without-Limit (presumably because the existence of the Limiting implies something else on which it impresses Limit, and on the other hand, if everything were Unlimited, nothing with form would exist), so that they must be made up of both factors. That-Which-Limits (the Form) and That-Which-is-Limited (Material). This is borne out by observation: things

^a B1

¹ Burnet, *EGP*⁴, pp. 277-199

made up from that which makes Limit are themselves Limit-making, things made up from the Without-Limit are without-limit, and things made up of a mixture partake of both qualities.^a There could be no beginning of knowledge if all were Without-Limit (formless) ^b Everything that is known has Number, nothing can be understood without it ^c (It is to be noticed that this differs from the usual Pythagorean doctrine that everything *is* Number) Numbers are of three kinds (not two) the Odd, the Even, and the Odd-Even^d (that is, those even numbers of which the halves are odd, such as ten)

The essential nature of things is eternal, nature, to be fully understood, requires divine, not human, intelligence. In fact it would be impossible for us to understand anything that exists unless underlying it there were the essential nature of things, those things from which the whole universe took its rise, that is, things giving Limit and things without Limit. These elements are unlike and unrelated, and could not be made into an ordered whole without the agency of Harmony, which came into being for this purpose and fulfilled the task of fitting together things that are unlike and unrelated.^e

So much for the general scheme of things. The remaining fragments deal with particular spheres of knowledge. A fragment on music gives the component parts of the octave: the octave contains the major fourth and the major fifth.^f The fifth is greater than the fourth by a tone. The ratio of the lengths of the strings giving out the notes of these intervals is: Octave, 1 . 2, Fourth, 3 . 4, Fifth, 2 . 3. The octave consists of 5 tones and 2 semitones, the fifth of 3 whole tones and 1 semitone, the fourth of 2 tones and 1 semitone ^g

There follow some observations on particular numbers. The Monad, or Principle of One-ness, is the first number fitted together (it was regarded as being both odd and even). It is placed at the centre of the Sphere and is called the Hearth ^h. It is the first principle of everything.^b But the number Ten is the most perfect, without it everything would be uncertain

^a B₂^b B₁^c B₄^d B₅^e B₆, B₁₀^f B₆^g B₇^h B₈

¹ These were the only intervals less than the octave which the Greeks recognized as consonant to them: the intervals of the major third and the sixth were dissonant (Reinach, *La Musique Grecque*, gives a clear account of the elements of Greek music.)

συλλαβή = major fourth (later διὰ τεσσάρων)

δι' ὀκτῶν = major fifth (later διὰ πέντε)

and obscure.^a There follows a remarkable panegyric on the nature of Number, as Leader and Teacher of everyone in whatever is doubtful or unknown. Without it, nothing could be known, either in itself or in its relationship to other things; but since it exists, the man who fits it into his soul can perceive everything as knowable, whether divine or human, in whatever craft or art. The nature of Number, that is, Harmony (the fitting-together of things according to numerical systems) is incapable of admitting anything false; falsehood and Envy belong to the Without-Limit, the Unintelligible, the Irrational. No falsehood can breathe upon Number, for falsehood is the enemy of nature, and truth is close kin to the family of Number.^b

A brief fragment refers to the 'five elements of the Sphere'. Fire, Water, Earth and Air in the Sphere, and the vehicle^c of the Sphere as the fifth. There is here no mention of the five regular solids, with which they were equated, so that the quotation if genuine is incomplete.^d A physiological fragment analyses the four elements of the Rational Animal as Brain (the seat of Mind), Heart (the seat of feelings and soul), navel, and organs of generation. The brain is peculiar to man, the heart is proper to animals, the navel (corresponding to roots) proper to plant-life, and the organs of reproduction to all, since all things grow from seed.^e

Lastly come ethics. Clement quotes Philolaus as preaching the ancient doctrine of transmigration — that the soul has been enclosed in its body, as in a tomb,^f for sins in a past life.^g A corollary to this was the view that so long as we are in the body, we are bound to stay there as in a prison, and not try to escape that is, suicide is a sin.^h Cebes in the *Phaedo* claims to have heard this from Philolaus himself. Aristotle attributes to

^a B11, cp A13 ^b B11 ^c B12, cp A17 ^d B13 ^e B14 ^f B15

¹ ἄλκός. The word means the hull of a ship, it has been disputed, but the emendation to δακός ('envelope') is even less satisfactory (Wilam-Moell, *Platon*, Vol II, p. 91). It is difficult to see how the metaphor of a ship can fit the Pythagorean scheme, one can hardly agree with Diels that the Aether encloses the Cosmos as a merchant-vessel encloses its cargo, this would mean that the Central Fire was in the hold. Cp p. 225 above.

² σῶμα σῆμα. no doubt a common Pythagorean proverb, quoted by Plato in the *Gorgias*, together with the saying that the soul is a jar because of its credulity and receptivity (πίθος, πίθανός) and a sieve (κόσκινον) because of its insatiability. Plato says he got this from a witty Sicilian or Italian, so that this may refer to Philolaus or Archytas. Cp Chapter I, pp. 14, 15 above.

Philolaus the saying that we have certain thoughts (Logoi) which are stronger than ourselves.^a

Of the three references to the book called *Bacchae*, the first states that the world is one, and that it began to evolve from the middle outward, the 'upward' being correspondent to the 'downward'.^b This describes the circular system as if it had a top and a bottom. The second reference concerned the sun, but is lost,^c and the third classes the book among those which explain the nature of God by means of mathematical figures.^d Beside the cosmogony can perhaps be set the reference in Aëtius, where he says that Philolaus says the destruction of the universe comes about from two causes: fire rushing from the sky, or water from the moon, the air having been poured out by the revolution. These three elements supply the 'nurturing exhalations' of the Cosmos, but can apparently cause destruction if any one gets the upper hand.^e

45 EURYTUS

EURYTUS of SOUTHERN ITALY about 400 B.C. He was a pupil of Philolaus and, like his master, was assigned to several cities: Croton, Metapontium, Tarentum.^f

Theophrastus, and an unknown commentator on Aristotle,^g have preserved Eurytus' contribution to Pythagorean thought: he interpreted the doctrine that Things are Numbers to mean that shapes are delimited by points. This theory was applied by others to metaphysical concepts: for instance, the soul is said to come from One, and Space (or the Void) from Two. Again, it was applied to mathematical forms: the triangle was Three, the quadrangle Four, and so on. Beyond that, they did not go. Eurytus, however, continued the process, assigning specific numbers to Man, Horse, and other particular existences of the animal and vegetable kingdoms. The number composing Man was assumed to be 250, that of Plant, 360.

He demonstrated his theory in a graphic way, by means of coloured pebbles which he used to stick on to a wall smeared with plaster, and so represent the form of Man or Plant with the number of 'units' which he said composed them.

^a B16 ^b B17 ^c B18 ^d B19 ^e A18 ^f 1, cp 44A4 and 5 ^g 2, 3

The crudity of this interpretation needs no comment; but it was at least an attempt to understand the Pythagorean theory of Number as the material element, and shows how little this could convey to the weaker members. Yet Eurytus is classed with Philolaus as one of the men who taught the last generation of Pythagoreans.^a

46 ARCHIPPUS. LYSIS OPSIMUS

ARCHIPPUS and LYSIS of TARENTUM ^b middle of fifth century.

OPSIMUS of RHEGIUM.^c contemporary, or a generation later

Archippus and Lysis are named by Iamblichus as the only two who escaped from Croton.^d Archippus went back to his native town Tarentum, Lysis through hatred of oligarchical government crossed to Thebes, where he became the teacher of Epameinondas.^e Here he died.^f He was at some time the teacher of Philolaus ^g

Lysis was sometimes credited with having written books ascribed to Pythagoras ^h He said that the Number composing God was inexpressible, but Opsimus held the opposing view that God could be expressed by the number One. The 'proof' of this was God is that by which 'the greatest of the numbers' exceeds the nearest approaching number. Ten is the 'greatest' number (in importance and power), Nine is the nearest to it, therefore God is the number One.ⁱ Nothing else is known of Opsimus The opinions of Archippus are unrecorded

47 ARCHYTAS

ARCHYTAS of TARENTUM first half of fourth century.

Archytas was a contemporary of Plato A letter written by Plato to him survives,^j as well as a forged letter from Archytas to Plato His *Life* was written by Aristoxenus of Tarentum,^k

^a 44A4, 5 ^b 1 ^c 5 ^d 1, 14 (Pyth) 16, cp 44A4a ^e 1, 3
^f 44A1a ^g 3 ^h 4 ⁱ A5, A6 ^j A9, A1

^k See above, p 78, note ¹ Either the massacre at Croton took place after the death of Pythagoras, or there is confusion between this Lysis and the Lysis who taught Epameinondas The latter is credited by Diogenes Laërtius with a letter to Hipparchus, who wrote on Democritus. see below, p 325

whose father Spintharus knew Archytas well;^a and Aristotle wrote a work in three books on his philosophy. All other writers draw on these sources, so that the tradition regarding him is exceptionally sound. The titles of numerous writings are ascribed to him,^b some of these are spurious, others doubtful; but he certainly wrote a work on *Mathematical Science*, and on *Harmony*,^c and very probably also one on *Mechanics*.^d Three fairly long fragments survive, as well as his construction and proof for the finding of two mean proportionals. The fragments are written in literary Doric.

Archytas, a Pythagorean, pupil of Philolaus, was equally distinguished in scientific thought and in practical life. He was for many years elected general of Tarentum, under the democratic constitution which ordinarily allowed this office to be held for one year only, and during his term of office he was never defeated.^e His authority was accepted not only in Tarentum, but over a confederacy of Greeks in Magna Graecia,^f and he was able to negotiate with rulers as powerful as Dionysius of Syracuse.^g The powers allotted to him by his fellow-countrymen were autocratic,^h but there is no record of his ever having abused them, on the contrary, all the anecdotes told of him exhibit his justice, kindness and self-restraint.ⁱ His love of children was proverbial. 'Archytas' rattle' was a mechanical toy invented by him to give children an outlet for their energies,^j and this may have been the purpose of the wooden dove he made which flew.^k His reputation with the Romans was legendary, as is shown by the reference to him in Horace's Ode.^l In Aristoxenus' *Life* he was depicted as debating with the hedonist philosopher Polyarchus, this served Cicero as a basis for a tirade against pleasure, put into the mouth of Cato, and purporting to be an 'old speech' of Archytas which Cato had learnt when as a young man he was staying in Tarentum.^m

Plato on his travels visited and established a friendship with Archytas. It was Archytas who persuaded him to visit Dionysius, much against Plato's own judgement, for the second time in 360 B.C., and Archytas was obliged to intervene and save Plato when the latter's life was endangered.ⁿ

^a §8D6 §197 ^b A9, A2 ^c B1 ^d B7, cp A1 ^e A1 ^f A2
^g A5, A1 ^h A2 ⁱ A1, A7, A8, A9, A11, A12, A5 ^j A10, A2, cp A8
^k A10a ^l I, 28 (A3) ^m A9 ⁿ A5, A1

Archytas' achievements in mathematics were even more remarkable than his success as a general and ruler. In the first place, he had to the full the Pythagorean belief in the efficacy of Number to explain everything correctly: it is not surprising, he says, that mathematicians alone can give a true judgement on all natural phenomena, both generally and severally. They have provided us with a correct account of the speed of the heavenly bodies, their risings and settings, as well as of (plane) geometry, arithmetic, spherical geometry, and music.^a This shows that Archytas recognized the mathematical subjects mentioned by Plato in the *Republic*,^{b, b1} though Plato adds solid geometry to the list.

His views on Calculation, or Arithmetic, are suggested in an incomplete fragment from a book entitled *Studies*: he set this science far above all others, and even above geometry, as being able to treat problems still more clearly and to furnish proofs and deal with the Forms.^{c, c1} That is, Arithmetic goes back to first principles, the essential nature of numbers themselves. In particular, he discussed the nature of the Monad, and defined it as partaking of the nature of both odd and even, because when added to an odd number, it made that number even, and when added to an even number, made it odd.^d He was also said to have written on the Decad.^e The passage in which he clearly states the definitions of the three kinds of progression—arithmetical, geometric and harmonic—is preserved: the arithmetical mean occurs when three terms are so related that the first exceeds the second by the same amount as the second exceeds the third (for example, 6, 4 and 2); the geometric mean, when the first is to the second as the second is to the third (for example, 2, 4 and 8); and the harmonic mean, when 'by whatever part of itself the first exceeds the second, the second exceeds the third by the same part of the third', for example, 6, 4 and 3, when $6-4=2$, $4-3=1$, and $2 \cdot 6=1 \cdot 3$. These definitions occur in his work on Music, and are given as a preliminary to that study, not to arithmetic.^{f, f1} He also stated and proved the proposition that there can be no number which

^a B1 ^b *Republ* 528A ^c B4 ^d A20, A21 ^e B5 ^f B2

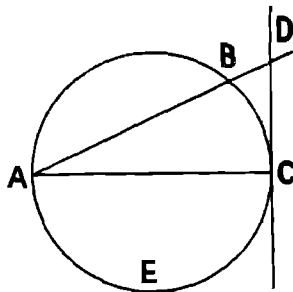
^{b1} See Heath, *Gk Maths*, Vol I, pp 11-13

^{c1} The word used is εἶδη. This probably means the 'forms' of Number, i.e. the Odd and the Even, it is so used by Philolaus, 44B5

^{f1} The harmonic mean was so called because its terms gave the numerical ratios of the three principal musical intervals $6 : 3 = 2 : 1$ (the octave), $6 : 4 = 3 : 2$ (the fifth), and $4 : 3 =$ the fourth

is a geometric mean between two numbers in the ratio $n : n+1$.^a Archytas' proof cites as already known several propositions which occur in slightly different forms in Euclid's Book VII, Archytas therefore must have had access to some handbook on the Elements of Mathematics similar to that of Euclid, and used by Euclid in compiling his own book.

In geometry, Archytas worked out a brilliant construction in three dimensions by which two mean proportionals between two given lines could be found. The construction and its proof are given in full by Eutocius.^b Archytas' construction required a circle, a half-cylinder erected on half this circle at right angles to it, a *tôrus* generated by the revolution of a semi-circle, and a right cone generated by the revolution of a triangle round a point. The curves described by these figures intersect in such a way as to give the required two mean proportionals



AB, AC are the given lines, to which it is required to find two mean proportionals x and y , i.e. two lines such that $AB : x = x : y = y : AC$

On AC as diameter, a circle is described, with AB as its chord

The semicircle on AC, revolving with one end fixed at A, at right angles to the plane of the circle ABCE, produces the curved solid known as the *tôrus*

A half-cylinder is generated on the semicircle ABC by a line moving at right angles to the plane of ABC. The revolving *tôrus*, passing through the half-cylinder, gives a curve

Then the triangle ACD is described, CD being the tangent at C, and AD the result of producing AB to meet this tangent at D

The triangle ACD is then made to revolve round AC, thus generating a right cone with apex at A. The resulting surface will cut the curve formed by the half-cylinder and the *tôrus*, and if the point of intersection be called P, AP will be x , the first of the required mean proportionals

The revolving triangle ACD will at the moment of intersection when P is found, also intersect the circumference of the circle at a point which may be called M. The line AM will be y , the second of the two mean proportionals

Thus $AB : AP = AP : AM = AM : AC$

^a A19

^b A14

^{a1} For translation and explanation, see Heath, *Gk Maths*, Vol I, p 215.

A proof is then given.¹

This construction solved for the first time the problem of the duplication of the cube; for as Hippocrates of Chios had pointed out, the duplication of the cube depended on the finding of two mean proportionals between two lines one of which should be twice the length of the other, and Archytas' solution applied to two straight lines of any length.

Other solutions were afterwards evolved, but none more brilliant, it was the conception of a three-dimensional figure with moving lines generating planes, and moving planes generating solids, which caused it to be said of Archytas that he originated the science of mathematical mechanics.^a Plutarch records the statement that Plato censured this and other such solutions as having recourse to the visible, instead of relying on pure reason,^b but this seems to be an assumption based on the *Republic*,^c where Plato condemns the *ad hoc* way of studying astronomy, and to have no more warrant than the statement in Diogenes Laertius, that Plato credited Archytas with having discovered the (duplication of the) cube.^d Plato does not mention Archytas in this connection, or refer to him by name, except in the Seventh Letter.

In connection with spherical geometry must be mentioned his remarkable argument regarding infinity. The problem was: 'If I had reached the outside (of the universe), say the heaven of the fixed stars, could I stretch my hand or my stick outwards, or not?' He concluded that at any point it was always absurd to answer No, so that, no matter whether what is beyond at each stage be body or space, there must be extension to infinity.^e He thus for the first time gave a reasoned proof in support of the theory of Melissus as opposed to that of Zeno.

He was said to have paid more attention to the study of music than any of the Pythagoreans,^f applying his mathematical knowledge to the theory of sound. In general, he held that no sound is produced without the striking of one thing on another. Now there are numerous sounds which are outside the range of our natural perception, because of the weakness of the impact producing them, or the distance of the subject from

^a A1, B7 ^b A15 ^c VII, 528B ^d A1 ^e A24 ^f A16

¹ For complete diagram and translation (English) see Heath, *Gk Maths*, Vol I, pp 246-91 (German) Diels, *Vors* I, pp 425-7

the source of the sound,¹ or even because the sound is too loud.² Difference in pitch is due to the rate of motion communicated to the air by the blow. rapid motion gives high pitch, slower motion gives lower pitch. In support of this, he gave several illustrations: the human voice, the note of the reed and the flute, the sound of the drum used in religious ceremonies.³ In particular, he worked out the numerical ratios corresponding to the intervals between the notes of the tetrachord⁴ for three different types of scale: the enharmonic, the chromatic, and the diatonic.^{5, 6} Archytas wrote much on music, recording not only his own calculations, but those of other Pythagoreans: an example of the latter's work in experimenting arithmetically with the numerical ratios corresponding to octave, fourth and fifth, is quoted from Archytas by Porphyry,⁷ but does not seem to have much point in comparison with Archytas' own careful and well-directed investigations.

He touched on biology with an inquiry into the reason why all the parts, other than the main organs, of plants (stem, shoot) and animals (arms, legs, trunk) are rounded, not triangular or polygonal,⁸ and with an inquiry into the nature of sight.⁹ The former he explained by means of his theory of motion: the most natural type of motion is that according to 'equal proportion' (as for instance when a triangle revolves on its central axis and generates a cone) and this alone returns on itself, generating rounded surfaces. In his explanation of the latter, he differed from Plato, who thought that the rays from our eyes mixed and united with the outer light to produce images, whereas Archytas thought that the visual rays alone were effective, without assistance from outside.

^a B1, A19a, cp B6 ^b A16 ^c A17 ^d A23a ^e A25

^{b1} These intervals are given in full in Diels, *Vors* Vol I, p 428. The series of intervals of the Greek tetrachord is: in the diatonic scale, tone, tone, semitone; in the chromatic scale, minor third, semitone, semitone; in the enharmonic, major third, quarter-tone, quarter-tone. The last, which owed its origin to the flute, enjoyed a great vogue during the fifth century and temporarily ousted the diatonic, but fell into discredit in the fourth century. The chromatic scale originated with stringed instruments. See Reinach, *La Musique Grecque*, pp 15 sqq.

¹ The answer to Zeno's puzzle of the millet-seed. See above, p 163.

² The reason why we cannot hear the music of the spheres. See below, p 253, and above, p 82.

³ A tetrachord is a series of four notes (or half an octave) between the first and last of which the interval is a major fourth, e.g. from E to A. See above, p 230.

⁴ The idea was probably suggested by the growth of the tree-trunk in rings from the centre outward, the human trunk is thought to grow outward in layers in the same way. There is also an analogy with the Pythagorean evolution of the universe from the centre outward in circles.

He touched on metaphysics in defining the cause of anything as twofold, material and active ^a Eudemus suggests that his use of the word 'cause' for certain mathematical concepts such as the Great-Small, Equal-Unequal, Odd-Even, was better than that of Plato's classification of them as forms of 'motion', which is absurd ^b

A passage in Archytas' own words, from his book on *Mathematics*,^c strongly recalls Plato he says that all knowledge is acquired in one of two ways, either by learning it from others, or by discovering it for oneself. He adds that the thing learnt from another is alien, but the thing discovered by one's own efforts is individual, further, that discovery without research is difficult and rare, discovery with research easy, but impossible unless one understands the right method of investigation.

There follows a passage in rhythmic oratorical prose in which Reasoning is extolled as a force towards social amelioration: it checks strife, increases harmony, gives equality and justice, and banishes greed. Rich give to poor, poor receive from rich, in a desire to achieve this 'equality' or fairness A correct 'calculation' of consequences prevents the commission of crime ^d

It will be observed that in all Archytas' enthusiasm for the manifold wonders wrought by Number, there is no hint of any religious or magical admixture such as is attributed to Philolaus and others The rational attributes of Number and Harmony are sufficiently wonderful in themselves, hence his belief that in education literature should be subordinated to music.^e

48 OCCELUS

OCCELUS (or OCELLUS) of LUCANIA date uncertain

Occlus is mentioned in Iamblichus' list. He appears to have been one of a family of Lucanians¹ who took up Pythagoreanism,^f and the only indication of his date is the tradition (for which the only warrant is in the forged letter from Archytas to Plato) that Archytas visited his descendants ^g, ^g¹

^a A22 ^b A23 ^c B3 ^d B3 ^e A19b ^f 1 ^g 4

^g¹ Lucian (*pro Lapsu* I, 729) for the purposes of his fiction makes Occlus and Archytas contemporaries of Pythagoras

¹ The Lucanians were not highly esteemed by the Greeks Isocr VIII, 50, Dion Hal *Demosth*, 17

Titles of several works were ascribed to him: *On the Nature of the Whole*, *On Law, Kingship and Piety*.^a Stobaeus quotes from the treatise *On the Nature of the Whole*, attributing it to Ocellus; but these passages are now regarded as a forgery.^{b, b1} Ocellus is said by late writers to have demonstrated (with Pythagoras and others) that the world and the human race were eternal,^c but Sextus couples his name with Aristotle's as believing that the universe was created out of the five figures,^d and Joannes Lydus, purporting to quote Ocellus' own words, credits him with 'the Triad first constructed beginning, middle and end'

We must therefore conclude that Ocellus was a member of the school who lived somewhat distant from the city centres, and wrote for his own people;^e that he probably was concerned merely to pass on Pythagorean doctrines, and originated nothing, and that his writings, though the memory of them lingered, were lost before it was thought worth while to forge others under his name in Roman times.¹

49 TIMAEUS

TIMAEUS of ITALIAN LOCRI

There is no evidence for the existence of Timaeus except Plato's dialogue of that name. He is there described as of good family, rich, and having held the highest offices in his city,¹ and as one who had made a special study of astronomy. The fact that such a man left no mark on political or philosophical history is now regarded as ground for believing that Plato invented the character.² The treatise *On the Soul of the Universe and Nature*, ascribed to Timaeus, is a forgery of the first century A.D., derived from Plato's dialogue

^a J, 4, 5, 6 ^b 7 ^c 2, 3, Stob. *Ecl.* 1, 20 ^d 3a ^e Ch. 49 (Timaeus) 3

^f 1 (*Tim.* 20A)

^{b1} The passages (not given in Diels) can be found in Pauly-Wissowa, *Real-Encycl.* s.v. *Okellos* (Vol. XVII 11, pp. 2362-2380)

¹ The question has been minutely discussed by German scholars. Harder, *Neue Phil. Unters.* I (1926), Theiler, *Gnomon*, II (1926), Beutler, Pauly-Wissowa, XVII, 11 (1937)

² See Cornford, *Plato's Cosmology*, pp. 2, 3

50. HICETAS

HICETAS of SYRACUSE: date unknown.

His theory is preserved by Cicero, drawing on Theophrastus. He was a Pythagorean, and held that the whole heavens, with sun, moon, and stars, stand still, the earth alone moves, revolving with great rapidity on its axis, thus creating the same appearance as if the earth stood still.^a He apparently accepted the Pythagorean belief in Counter-Earth,^b we are not told how he fitted it in with his revolution-theory, but probably he was one of those who gave this title to the moon.¹

51. ECPHANTUS

ECPHANTUS of SYRACUSE: date uncertain.

Ecphantus, like Hicetas, believed that the earth revolves on its own axis,^c towards the east, and that this, not a change in its position in space, accounts for the phenomena of the skies.^d He was a Pythagorean,^e he held views which, reported by late writers,^f sound like those of Anaxagoras and the Atomists: the primary bodies are indivisible, and have three differences — size, shape and force — from which perceptible objects arise. They move not by their weight or by impact, but by a divine energy which he called Mind and Soul, or Purpose. There is only one universe.^g

52. XENOPHILUS

XENOPHILUS of CHALCIDICE: first half of fourth century.

Xenophilus was one of the last of the Pythagoreans whom Aristoxenus knew.^h He was said to have lived to the age of over a hundred and five, at Athens, without experiencing any physical disability, and to have died with his intellectual powers still at their best.ⁱ He specialized in music, and was one of Aristoxenus' teachers.^j

^a 1 ^b 2 ^c 1 ^d 1, 5 ^e 2, 5 ^f 1, 2, 4 ^g 1, 3 ^h 1, 2 ⁱ 2 ^j 3
¹ See p. 227 above

53. DIOCLES, ECHECRATES, POLYMNASTUS, PHANTON, ARION

These men were inhabitants of Phliûs, where they constituted a Pythagorean 'cell' at the beginning of the fourth century.^a They were pupils of Philolaus and Eurytus.^b

Echecrates, who was connected also with Tarentum,^c was a speaker in Plato's *Phaedo*, and is there made to refer to the Pythagorean^d doctrine that the soul is a harmony.^e

54. PRORUS, AMYCLAS, CLEINIAS

PRORUS of CYRENE, AMYCLAS, and CLEINIAS of TARENTUM were latter-day Pythagoreans.

Aristoxenus is the authority for the existence of these men, and the little that is known of them.

Cleinias was the best known. It is said that he went to Cyrene from Tarentum in order to help Prôrus (who had lost his property in a civil strife), merely on hearing that Prorus was a Pythagorean.^f His name was coupled with that of Amyclas (otherwise unknown) as having prevented Plato from burning the books of Democritus,^g and two anecdotes are told of him, one illustrating the belief that the music of the lyre soothes anger,^h the other showing an un-Pythagorean hatred of women.ⁱ

Forged writings on arithmetic in the name of Prorus and Cleinias were in circulation in later times.^j

55. DAMON AND PHINTIAS

DAMON and PHINTIAS of SYRACUSE lived in the reign of Dionysius the Younger (367-56 B.C.).

Their story, like that of Cleinias and Amyclas, was said to have been told by Dionysius the Younger to illustrate the strength of Pythagorean friendship. Phintias, condemned to

^a 1 ^b 44A4 ^c 58A, 1 26 ^d 44A23 ^e 4 (*Phaed* 88D).
^f 3, 58D7 §239 ^g 2 ^h 4 ⁱ 5 ^j 16

death for alleged treason, is able to produce a friend willing to stand surety for him while he arranges his affairs, and himself duly returns at the appointed time to undergo sentence. They are released by Dionysius, who had devised the scheme to test them, but refuse to admit him into their friendship.^a

56 SIMUS, MYONIDES, EUPHRANOR

SIMUS of POSEIDONIA: fourth century.

MYONIDES and EUPHRANOR

Simus was accused of having stolen and put forward as his own certain Pythagorean discoveries, including that of one of the seven 'means' or kinds of proportion.^{b, b¹}

Myonides and Euphranor were said to have brought the number of 'means' from six up to ten.^c Euphranor was, like many other Pythagoreans, a skilled flute-player.^d

57 LYCON

LYCON (or LYCUS) of TARENTUM late fourth century

Lycon is credited with a book on the Pythagorean life.^e Tradition also connects him with Iasos^f in Caria, so that he may have gone to Tarentum for instruction, and written the book for his own people.

His writings seem to have been concerned chiefly with diet. He stated that Pythagoras' diet was moderate; and he mentioned a certain kind of lettuce well known as an anti-aphrodisiac.^g

He is named by Aristocles, the Peripatetic (who lived in the

^a cp Ch 54, and 58D7 §§235-599 ^b 2 ^c 3 ^d 44A7 ^e 3
^f 3 ^g 2, cp 5

^{b¹} Diels argues that the testimony regarding these three shows the rivalry existing in the Pythagorean school during the fourth century. Pythagoras had known only three types of progression (arithmetic, geometric, harmonic), Hippasus and Archytas added three more, and the last generation, Myonides and Euphranor, discovered another four. The discovery of Simus was denied to him by jealous fellow-workers (Diels, *Vors* I, p. 445, Heath, *Gk Maths*, pp. 86, 87).

third century A.D. and is quoted by Eusebius) as having re-tailed several absurd stories about Aristotle,^a one of which speaks of Aristotle's departure to Chalcis (in 322 B.C.); Lycon was therefore one of the last of those who called themselves Pythagoreans.^b

58 PYTHAGOREAN SCHOOL

A *Iamblichus' Catalogue*

Iamblichus (fourth century A.D.) wrote an account of Pythagoreanism in ten books. The first book, a *Life of Pythagoras* and his school, contains a list of all Pythagoreans known by name, and their native cities. There were naturally many others whose names remained unknown. The total number of names was 218 men, 17 women, as follows:

MEN	Croton	29
	Metapontium	38
	Acragas	1 (Empedocles)
	Elea	1 (Parmenides)
	Tarentum	43
	Sybaris	12
	Carthage	4
	Paros	10
(Italian)	Locri	10
(Italian)	Poseidonia	7
	Lucania	4
(Italian)	Dardania	1
	Argos	6
	Laconia	3
	'Hyperborea'	1
	Rhegium	12
	Syracuse	3
	Samos	6
	Caulonia	5
	Phlius	4
	Sicyon	4
	Cyrene	4
	Cyzicus	4

	Catane	2
	Corinth	1
	Etruria	1
	Athens	1
	Pontus	1
WOMEN'	Croton	3
	Lucania	2
	Sparta	2
	Metapontium	1
	Arcadia	1
	Tarentum	2
	Phlius	1
	Sybaris	1
	Laconia	2
	Argos	2

From this list it will be seen that the cult remained attached to South Italy, in spite of the débâcle at Croton. Aristotle sometimes calls them 'the Italian group, the so-called Pythagoreans',^a and Iamblichus in his *Pythagorean Life* says that the Pythagorean training caused Italy to be filled with philosophers, poets and statesmen, so that thanks to Pythagoras it was called 'Great Hellas'^b (Magna Graecia).

B *Anonymous Pythagoreans*

The chief authority for the opinions of the Pythagoreans is Aristotle. Plato, though he was the first to bring back definite information on Pythagorean teaching from Italy to Athens, and was obviously steeped in Pythagorean thought, wove their theories into his own system and did not expound them separately. Aristotle, however, took great pains to understand and assess the value of the Pythagorean contribution. He wrote a special book *On the Pythagoreans*, but this, strangely, did not survive, though much of the later writing on Pythagoreanism must have been based on it. Apart from this, Aristotle wrote at length on particular points of Pythagorean doctrine in the *Metaphysics*, and there are references in *De Caelo*, *Physics*, *Ethics*, *Politics*, *Posterior Analytics*, and *Problems*.

^a 58B8, 58B37, 42, 5, 65, 3, 31B136

^b 58D §166

The Peripatetic School pursued Aristotle's interest in the Pythagoreans. Of his pupils, Aristoxenus of Tarentum wrote on the Pythagorean Life, as well as on Music, his special subject, he was well qualified to record the development of the Pythagorean studies, since he was personally acquainted with the contemporary members of the School, and his father Spintharus knew the previous generation. Theophrastus wrote on Pythagorean metaphysics, and Eudemus on their theories of number and harmony. Almost all other accounts are found in late writers: the Neo-Platonists, Porphyry (third century A.D.), Iamblichus (fourth century A.D.), Proclus (fifth century A.D.), Simplicius (sixth century A.D.), as well as in the compilers of collections, Diogenes Laertius, Stobaeus (fifth century A.D.), and the lexicographers.

Aristotle, having devoted a separate book to an account of Pythagoreanism, mentions elsewhere particular points only, which he wishes to criticize. When these passages are collected together,¹ variant opinions among the Pythagoreans themselves emerge, and it is not possible to gather either to what groups, or what times, these differences are to be assigned. Further, it is not always clear what the authors of the view Aristotle happens to be criticizing actually said, this has to be gathered from his remarks, and even then we do not know if he has stated their case fairly, in fact, it is sometimes greatly to be suspected that he did not. These considerations make the task of setting out a consistent scheme as 'Pythagorean' difficult, but the following outline emerges fairly clearly.

They said that the essential nature of things was due to Number. This, to some of them, meant that things are made up of numbers in the same way as a man is made up of flesh and bone, or a statue of bronze or wood.^a To others, it meant that the nature of a perceptible thing depends on its 'number'. This latter statement was taken in two ways: either that everything had a particular number which belonged to it and explained it^b (for example, the triangle's number is 'three'), in which case one can say that the thing 'imitates' or is a copy of

^a 4, 5, 8, 9, 10, 11, 22, 25 ^b 4, 8, 22, 27

¹ On these passages, see the admirable notes in W. D. Ross' edn. of Aristotle, *Metaphysics*.

the number;^a ^{a1} or that its nature could be expressed by a ratio (for instance, mead is 'three and three' because it consists of three parts of honey to three of water)^b

These three views are all criticized by Aristotle. He attacks the first position by saying that it does not explain how size and weight came into being,^c the second position by saying that the equations between things and numbers are superficial and dependent upon chance correspondences rather than on any laws,^d and the third position by saying that the ratios in which things are mixed do not suffice to explain them, because the nature of the mixture depends on the nature of the original ingredients (which remains unexplained) much more than on the ratio in which they are added to one another.^e

It is abundantly clear that many, perhaps the majority, of Pythagoreans maintained that things are made of numbers as of a material.^f ^{f1} The question therefore arises, what sort of thing did they take these numbers to be?^g Aristotle is not always able to answer this question, and he says in one passage that the Pythagoreans themselves could not say.^h But the basic theory was that the original Number was the Monad,ⁱ or Principle of Oneness, which is equivalent to Limit, in other words, they envisaged a dot, or point, which was the most elementary form that could be imposed on an empty space. The Space — the Unlimited as they called it — always existed, and is therefore an element like the Monad.^j When the Monad came into existence, it limited the nearest part of the Unlimited.^k This Monad is sometimes called the Odd, and sometimes given the attributes of both Odd and Even, the former because unlike any even number it cannot be divided (into integral numbers), and the latter because when added to an odd number, it makes that number even, and when added to an even number, makes it odd. (Aristotle remarks that they are mistaken in saying that the Monad cannot be divided, in

^a 12 ^b 27 ^c 9, 10, 38 ^d 8, 27 ^e 27 ^f 8 ^g 22 ^h 26

ⁱ 9, 10 ^j 28, 29 ^k 26

^{a1} Ross (*Aristotle, Metaphysics*, Vol I, p 163) suggests that Cornford's view (in *Class Q* XVI, 143) is right, viz that the 6th Century Pythagoreans thought that things 'imitate' numbers, i.e. that their external sensible form is modelled on their inner numerical nature, whereas the 5th Century Pythagoreans thought that Number is the very stuff of which things are made.

^{f1} Aristot. *Metaph. A5* 987a9, says that this was their individual contribution to metaphysics, or rather, the theory that the elements are the Limited and the Unlimited, from which Number comes.

imposing it on Space, like a dot, they have given it dimensions, and anything that has size is divisible)^a

Side by side with the Monad, there exists the Dyad, or Principle of Twoness^b This principle is inherent in the existence of space, or the Unlimited,^c it can be thought of as the possibility of repetition, so that the Monad, when multiplied in space, gives rise to Two and so to all the other numbers. Since it is Space that contributes this possibility, Space and the Principle of Twoness were often equated in the Pythagorean system, and the latter was called the 'Infinite Dyad',^d because once the principle of repeating or multiplying monads is recognized, this process can go on to infinity, taking place in infinite space The Dyad was also equated with the principle of Evenness of number, an even number being one that can be divided equally into two, and this was another reason adduced by some for calling the Dyad 'infinite', because the process of dividing by two can go on to infinity^e We thus have the elements: the Unlimited, equated with the Dyad and the Even, and the Limited, equated with the Monad and the Odd. It must however be added that the Pythagoreans sometimes forgot that they had equated the Principle of Twoness with Space itself, and spoke more naturally of Twoness as derived from Oneness,^f seeing Two as two Ones with Space in between, or again, as two points joined by a line^g

Thus at the beginning we have a series of opposites necessary to account for the visible world (Aristotle says that the Pythagoreans envisaged no other sort of reality except that which is perceptible)^h These opposites were added to by different thinkers, and a table of ten pairs was drawn up, by whom or at what time Aristotle does not know They wereⁱ Limit-Unlimited, Odd-Even, One-Many, Right-Left, Male-Female, Rest-Motion, Straight-Curved, Light-Darkness, Good-Bad,^j Square-Oblong Aristotle, while refusing these the title of elements in any sense of the word, admits at the end of the *Metaphysics* that there is a kind of relationship between ideas such as 'straight', 'good', 'equal', 'white', and

^a 10 ^b 9, 13, 14, 15 ^c 1a (*Vors* I, p. 449, 1, 2) ^d 1a, 14, 15 ^e 28, 2
^f 26 ^g 25 ^h 22, cp. Aristot. *Metaph.* N3, 1090a20 ⁱ 5

^j Some Pythagoreans denied a place to Good as a First Principle, because the developed thing is 'better' than that from which it springs, but Aristotle replies that the germ itself has to come from previous developed creatures. See Ross, *Metaph.* II, p. 381 (note on 1072b, 30-34)

so on.^a A separate explanation of the classification of Square on the side of the Monad and Oblong on the side of the Dyad or Plurality, is given^b in this, the figure known as the Gnomon is used,^{b, c} to show that the presence of the Even gives to things the element of inequality, whereas the Odd gives equality. Aristotle also criticizes the concept of infinity as an element; he says that it is merely a characteristic of certain things, not a constituent for example, the Air may be infinite, but it is not composed of 'infinity'^c

How did the Pythagoreans envisage the construction of things out of these numbers? Given corporeal monads in space, they appear to have conceived of them as moving, and thus building up other entities, not by coagulation, as the atoms coagulated in the void, but by traversing space and plotting out different forms.^d From the Monad and the Dyad (Space) come the numbers, from the numbers come the 'marks' (points envisaged as dots), from the dots come lines, from lines come plane surfaces, from surfaces come solids, and from solids the perceptible elements, fire, water, earth, air (which they thought of as made up of particles with the shapes of pyramid, eicosa-hedron, cube, octahedron respectively)^e This shows that they clearly recognized the formation of figures by the movement of other figures, as for example it is recognized in Archytas' theorem² that a line at right angles to a plane surface and moving in a circle describes a cylinder. But they spoke as if these 'limits of body, such as surface, line, point, monad', were all *substances*,^c because they thought that bodies were made out of them. For this, Aristotle criticized them, and also for

^a 27, cp 7, 6

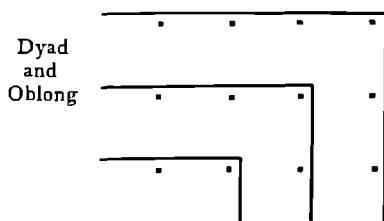
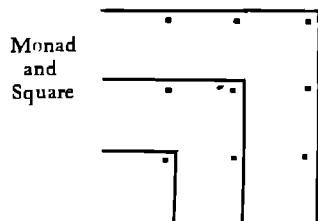
^b 28

^c 29

^d 1a

^e 23, 24

^{b1} Heath, *Gk Maths*, I, p 77. The Gnomon is two lines, or series of points arranged in a right angle, particularly if placed round the right angle of another figure. Hence if the Monad be taken, and a Gnomon arranged round it, this will always be another odd number, and always give a square, but if a Gnomon be arranged round the Dyad, the result will always be an even number forming an oblong



¹ See above, p 222

² See above, p 236

having assumed the existence of motion, an essential to their scheme, without having explained how it came about, especially as they had postulated elements from which motion could never be created or originated ^a

This conception of creation was carried out by them in their cosmology ^b The Central Fire, which was given that position because it is the 'best' position, and because Fire is more precious than Earth, ^c is equivalent to the Monad; it is the source of creation and government The Void, or Unlimited, is a formless mass of air or vapour Gradually the One 'introduces shape and limit into it, working from within outwards. The drawing-in (of the Unlimited by the Limiting) is further described as breathing, and the wind or void so drawn in is said to keep the units apart' ^d, ^{d1} From this process are derived Earth (with Counter-Earth), the planets, sun and moon, and the fixed stars, and everything they contain

Having thus obtained a universe of perceptibles, the Pythagoreans endeavoured to explain it in detail by means of the principle of Number Their researches must have followed different lines in different places, but in the course of their investigations they discovered many striking analogies between numbers and things, and also many properties of numbers themselves which proved to be the foundation of the sciences of arithmetic and geometry The three particular propositions attributed to them which were incorporated by Euclid are: that the angles of a triangle are together equal to two right angles, ^e that the square on the hypotenuse of a right-angled triangle is equal to the sum of the squares on the other two sides, ^f, ^{f1} and the method of application of areas, by which a parallelogram of any shape could be transformed into another with the same angle and equal area but with one side of any given length ^g ^{g1}

They discovered, apparently quite early, the relation between the notes of an octave and the lengths of the strings producing them, namely that (provided the strings are of the

^a 22, 5 (*Vors* I, p 453, ll 18, 19)

^b 22

^c 37

^d 26, 30

^e 21

^f 19 ^g 20

^{d1} Ross, *Metaph* Vol II, p 483, note on 10912, 15-18

^{f1} Attributed to Pythagoras himself

^{g1} Proclus, drawing on Eudemos, gives a long explanatory note on this method, which Heath describes as 'one of the most powerful methods on which Greek geometry relied' See his note and translation in *The Thirteen Books of Euclid*, I, p 343

same substance and tension) the consonances (or 'symphonies' as they called them), that is, the octave, the major fifth, and the major fourth, are produced by strings the lengths of which have the ratios 1 : 2, 3 : 2, and 4 : 3 respectively,^a and they pursued these studies into great detail.^b The work of Archytas shows that the leaders advanced the discoveries regarding ratios of different kinds, or 'means' as they called them; and also the study of higher geometry.

These successes led to the most thorough going application of the theory that 'all things are numbers', and this was interpreted in some quarters to mean that an actual number could be found which would explain every particular substance, shape or even abstract quality. Some of these identifications are obvious: for example, that the Line is Two, the Triangle Three, the Pyramid Four, because these are the numbers of the points or lines which delimit them. They also noticed that certain natural events, such as the periods of the sun and moon, the seasons, the crises of certain illnesses, the phases of human development, the number of stars in certain constellations, were connected with certain numbers,^c and they tried to analyse substances such as fire and water, which they regarded as the first to be created, into certain formulae, though without great success. Aristotle criticizes these efforts on various grounds, such as that the recurrence of a number like seven (seven Pleiads, seven against Thebes, teeth falling out at the seventh year in human beings, and so on) is due to different causes, and has no particular connection, and also that their formulae do not account for difference of substances, for if the only difference between, say, fire and water is that fire is equal to $2 \times 5 \times 3 \times 7$, and water is equal to $4 \times 5 \times 7$, then fire is merely water multiplied by 6, in other words, number is not sufficient to explain the difference between them, and, in fact, they had to assume that different things could come under the same number, which is impossible under their scheme.^d

Other more or less superficial 'likenesses' are mentioned by Aristotle, such as that the letters of the alphabet and the notes of the flute are the same in number (twenty-four), and this is the 'number' of the universe as a whole. Again, they identified the Central Fire with One, the Earth with Two, the Sun with Seven and so on.^e Another identification was that of the Soul

^a 44B6, cp. 58B18^b 47A16^c 2, 27^d 27^e 27

with Four,^a which was also the Principle of Health. Marriage, Justice and Injustice, Right Moment, Mixture, Opinion, Courage, were assigned not only special numbers, but also special places in the universe, a theory which completely puzzled Aristotle and led him to ask if they were not thinking of some other kind of number than that out of which they made the (visible) heavens,^b or else constructing out of Number some kind of bodies other than those we perceive.^c Even Number itself was given a special number which perfectly expressed its nature, namely the Decad, or Principle of Ten, the special properties of which interested them greatly for instance, that it is the sum of the first four integers.^d Threeness had special virtues. It stood for beginning, middle and end.^e Nine seemed expressive of Harmony, as representing the three consonances.^{f, 11}

Their meteorology has already been described, as it is by some attributed to Philolaus. Aristotle finds fault with it in general because it is not sufficiently governed by observation, but forces the facts to suit the numerical theories when necessary.^g As an instance of this, he mentions the body called Counter-Earth, revolving once a day between Earth and the Central Fire, and says that they inserted it for the sake of bringing the number of the heavenly orbits up to ten.^h Elsewhere he says that it was introduced to account for eclipses of the moon, which are more frequent than eclipses of the sun.ⁱ

There is a Right and a Left in the heavens, Aristotle criticizes them for not recognizing other directions such as Up-Down, Before-Behind, but Simplicius says they did recognize these, and that they equated them to Good-Bad, as Aristotle himself had said in his book on Pythagoreanism.^j They place Man in the upper hemisphere of earth (that is, facing outward towards the heavens, not inward towards the Central Fire); but Aristotle says that this does not suit our observations.^{k, k1} They discussed the Milky Way, which some of them said was the orbit once followed by the sun (as embodied

^a 15 ^b 22, 4 ^c *Met* N3 1090a20 ^d 15, 16, 44A13, 44A11 (see p. 222 above)

^e 17 ^f 18 ^g 4 (*For*: I, p. 452, ll. 9-10) ^h 4, 37 ⁱ 36, 37a ^j 30 ^k 31

¹¹ Octave, fourth and fifth, i.e. 7, 8, 9, and 2+3+4=9

^{k1} See Heath, *Aristarchus*, pp. 231-2, and Ross, *The Works of Aristotle Translated*, Vol. II, note on *De Caelo*, 285b

in the myth of Phaëthon), or else the path of a star, but others said it was the reflection of the sun on the sky.^a

Not only are the heavens a harmony;^b they actually make music. The rates at which the heavenly bodies travel cause them each to give out a sound, these sounds form a series related to one another like the notes of a scale, that is, a harmony.^{c, c1} The notes are related to the intervals between the bodies and the speed at which they travel, but we are not told how. The reason why we do not hear the sounds is that we have always been accustomed to hear them

Time was explained as the movement of the Whole.^d Different bodies make different kinds of time they called the Earth a star, as being one of the instruments of time, since by its movement it creates day and night.^e Others explained time as the Sphere itself, because everything is in time, and also in the Sphere — a 'proof' which Aristotle dismisses as too naive for discussion.^f As time is the movement of the Sphere, it eventually repeats itself^g (such cycles forming a Great Year)

The soul also is a harmony, this was sometimes modified to 'has harmony',^h that is, is a mixture of parts having an ascertainable ratio to one another. By the theory of metempsychosis, the soul can enter any body.ⁱ The curious belief was attributed to them by Aristotle that the motes of the sunbeam are Soul, that is, are alive, because they are constantly on the move, even when there is no wind,^j so that they believed the air to be 'full of souls', which affect our dreams and send omens of health and sickness, not only to us but to animals.^k They believed that animals were nourished by smell.^l

Aristotle in the *Metaphysics*,^m speaking of the genesis of the visible world from the Monad, states that the Pythagoreans could not say how the Monad was itself constituted, whether 'from plane surfaces, or from "colour", or from seed, or constituents they fail to describe'. The word 'colour' is the Pythagorean special term for surface,ⁿ so that the whole sentence probably represents Pythagorean doctrine. The mention of

^a 37b, cp ch 41, 10 ^b 4 (19) ^c 35 ^d 33 ^e 37 ^f 33 ^g 34 ^h 41
ⁱ 39 ^j 40 ^k 1a (*Fori* I, p 451, 1, 3) ^l 43 ^m 26 (*Met* 1091a) ⁿ 42

^{c1} This theory must have passed through several stages, since the Pythagoreans recognized only 7 notes to the scale (Heptachord) and there were eventually 10 bodies. For a full discussion, see Heath, *Aristarchus*, pp 105-199

'seed' in connection with the Monad therefore shows that they tried to use the Monad as an explanation of the generation of life as well as of numbers,¹ and points the way to the more elaborate theory of Anaxagoras.

C *Allegorical Precepts*

The method of teaching by allegorical precepts no doubt goes back to Pythagoras himself, for the disciples are said to have kept all that 'He' said as divine, and not to have tried to originate any new maxims, but to regard as the highest in wisdom those who had acquired the greatest number of these sayings.⁴

Iamblichus explains that these were divided into three categories: What is so-and-so? What is most so-and-so? and What is to be done and not done? These are undemonstrable and without explanation, they are meant to be accepted and acted upon, not discussed.

Examples of the first class are

What are the Isles of the Blest? Sun and Moon

What is the Delphic Oracle? The *Tetractys*

What is the abode of the Sirens? Harmony

These are obvious rationalizations of myths, others, quoted by Porphyry and Aelian,^b seem to belong to this category, but to approach more nearly to mere metaphor, such as that the Pleiad is the lyre of the Muses, and the planets are the hounds of Persephone. Aristotle says that 'the Pythagoreans' explained thunder as designed to terrify those in Tartarus,^c and elsewhere it is recorded that they explained the sound of the beaten gong as the voice of a demon imprisoned in the bronze.^d

Examples of the second type of question and answer are

What is holiest? Mallow leaf

What is most beautiful? Harmony

What is the truest saying? That men are wicked

What is the wisest? Number, and the next wisest, the man who gives names to things

^a 4 (§82)

^b 2

^c 1

^d 2

¹ Ross explains it differently (*Metaph* II, p. 484) 'His reference to seed probably implies that some Pythagoreans thought of the generation of numbers as akin to that of living things'.

Vo.

Iamblichus pointed out that this type of 'wisdom' is earlier than Pythagoras, and is the same as that of the Seven Sages.^a

The third category, consisting of Commands and Prohibitions, contains the most interesting material. Though the Pythagoreans were content to accept them without question, later writers busied themselves with interpretations. Anaximander the Younger of Miletus (405-359 B.C.) wrote an *Exegesis of Pythagorean Allegorical Sayings*^b

Examples of his work are

'Do not step across the beam of a balance,' meaning 'Do not be greedy'

'Do not receive swallows into your house,' meaning 'Do not admit chatterers.'

'Do not poke the fire with a sword,' meaning 'Do not irritate an angry man'

The Commands and Prohibitions, however, seem to be nearer to ritual and magic than these rather superficial explanations allow. Many of them directly concern ceremonial, for instance

'Sacrifice unshod'^c

'Do not turn aside when going to a religious ceremony'^d

'Do not eat holy fish'^e

'Do not sacrifice a white cock.'^f

'Sacrifice only those animals into which man's soul cannot enter'^g

'Do not eat beans'^h

'Do not eat birth, growth, beginning, end', that is, certain parts associated with these processes'

Others are nearer to personal magic, such as

'Shoe the right foot first'ⁱ

'Do not speak without a light' (in the dark).^k

'Do not pick up what has fallen'^l

'Do not break bread'^m

'Do not have intercourse with a woman wearing gold.'ⁿ

There were apparently lengthy provisions regarding the ritual to be observed in all cases^o Respect for the deity was

^a 4 (§83) ^b 6 ^c 16 ^d 15 ^e 3, 6 ^f 3, 12 ^g 18 ^h 3, 6
 ⁱ 6 ^j 4 ^k 4 ^l 3 ^m 3 ⁿ 4 ^o 4

inculcated: the image of the deity must not be worn on a ring, for this might lead to sacrilege.^a

These rules seem far distant in spirit from the splendid achievements of the mathematicians. One can only assume that, severed from its intellectual partner, the religious 'way of life' degenerated into a set of practices for which little reason except tradition could be found, and which were therefore liable to accretion and distortion. To sift the genuine precepts of Pythagoras from the later additions, and to conjecture their original meaning, was even in ancient times a thankless task. It is perhaps wiser to leave them 'undemonstrable and unexplained'.¹

D. *Extracts from the 'Pythagorean Declarations' and the 'Pythagorean Life' of Aristoxenus*

These are preserved mainly in Iamblichus' *Pythagorean Life*. There are also extracts in Stobaeus, sometimes in part the same as those of Iamblichus, and in Diogenes Laertius. They form a consistent account of a way of life which, though it may have been 'rationalized' from Aristotle onward, nevertheless in essentials must go back to Pythagoras, as the author claims.

The main outline is as follows: the Pythagoreans honoured chiefly music, medicine, divination, and silence, obedience, listening. Their medicine dealt chiefly with diet, proportions of food, drink, rest, and composition of medicines, they specialized in the treatment of wounds, but preferred the application of medicaments to surgery or cauterization. They believed that music, and poetry-readings, were a great aid to health, if correctly used.^b They employed medicine as a catharsis of the body, music of the soul.^c

In education they set a very high value on memory, which they trained by exercise: a Pythagorean did not rise from his bed until he had recollected in their exact order the events of the preceding day. It was thanks to this memory-training that Italy produced so many poets, philosophers and statesmen, and became called 'Great Hellas', exporting these to Greece Proper.^d

The service of God was inculcated. Man's unruly nature

^a 4, 6

^b I §§163-4

^c I *ad fin*

^d I §§164-6

¹ For a discussion, see Boehm, *de Symbolis Pythagoreis* (Berlin, 1905)

needs control, therefore he must serve God, and under God, his parents and the law. Nothing is worse than anarchy, therefore custom should not be lightly set aside, even for the sake of reform ^a But rulers must be humane as well as expert, so that subjects can be not only obedient but devoted The ruler must always be some one person or thing, namely that most worthy of honour, whether in thought, or action, in the household, the State or the army. Nothing can be right if the ruling factor is wrong Government must be by consent; only voluntary effort reaches its goal ^b

Education must be suited to the several distinct periods of development of the human being children must learn letters and such subjects, young men the laws of the State, adult men active life and public service, old men theoretical knowledge, judgement, counsel.^c Correct behaviour towards others is taught from childhood, this differs according to age, relationship, standing ^d The division of education into categories according to age must not be too rigid the education of the boy must anticipate to some extent that of the youth, and of the youth that of the adult, otherwise the well-trained child will throw over all discipline when he comes to manhood. The most difficult period is adolescence, which unites the faults of childhood and manhood — frivolity, and strong passions This age needs most attention, but at no age can a man be left to do as he pleases, he must always have someone or something to obey, because whatever is neglected degenerates ^e

The body must be kept to a uniform condition — not sometimes fat, sometimes thin, which shows an irregular life. So too the temperament must be uniformly cheerful, not sometimes elated, sometimes depressed All emotional disturbance was deprecated, rage or grief was avoided,^f or if that was impossible, not acted upon The Pythagorean, if seized with rage, retired into solitude and tried to cure it as he would an illness, he did not punish a slave, or admonish a free man, while still angry, but waited for the return of reason A story told of Archytas, by Spintharus the father of Aristoxenus, who told many stories about Archytas, illustrates this point ^g

Pleasure in particular must be guarded against, physical

^a 2, 3, 4

^b 5 §§182-end

^c 4

^d 5

^e 8

^f 6, 47A7

^g By the system known to Euripides as Preacclimatization (προσνημειν) and ascribed to Anaxagoras See p 264 below

desire is an urge of the soul, for what is natural (such as the satisfaction of hunger) or for what is superfluous ^a The satisfaction of the former is allowable, of the latter, not: desire for unnecessary food, clothes, bedding, houses and all luxury-objects goes on to infinity if once allowed its own way The young must be taught from birth to desire only the necessary, and repudiate vain desires Medicine tells us that every particular food has a particular effect; we see at a glance that wine taken moderately brings cheerfulness, but over-indulged in, causes madness and ill-behaviour, but the effect of the different foods — the choice of which, as of their preparation, is infinite — is not so easily discerned, except by the expert, who should be allowed to choose for us This knowledge has always belonged to medicine ^a Wrong desire takes three shapes lack of 'form', that is, the desire itself is vulgar or base; lack of proportion, that is, it is too violent or too long-sustained, and inopportuneness, that is, it occurs at the wrong time, or towards the wrong object ^b

The question of procreation of children is very important Insufficient attention is given to the breeding of human beings, whereas the dog-breeder or bird-fancier takes great care to get the right conditions Sexual intercourse should not be begun too young, the education of children must keep them pre-occupied with other things until the right time, which for a boy is not before twenty Boys and girls alike must be reared in hard work, exercise and endurance of the right kind, and given the diet proper to a hard-working, abstemious life When the right period is reached, there must still be great moderation; this must be induced by teaching the boy that physical fitness and indulgence cannot go together.

The general Hellenic laws of consanguinity and decency were approved of by the Pythagoreans, namely that intercourse with mother, daughter, or sister, or in a temple or public place, was forbidden They added that births which were 'contrary to nature', or brought about by rape, must be destroyed Intercourse must have as its object the breeding of children; and this must be undertaken only by those who have lived and are living a healthy life Every forethought must be shown by the future parents for the welfare of the child that is

^a 8^b 8 (*ad fin*)¹ The basis of Epicurean hedonism

to be, most people have children in the reckless, improvident way that animals do; and our lack of care in this regard is the chief cause of human badness.^a

A very high value is set on true friendship. For this, the Pythagoreans were famous. A member will do anything for another member, even if he has never seen him, and he lives at the other end of the earth, this feeling is handed down over many generations. Illustrations of Pythagorean friendship are the stories of Damon and Phintias,^b Cleinias and Prorus,^c and others.^d Such friendship demands that all rivalry, desire, anger and other causes of disagreement shall be excluded, the attitude must be that of a father to his children.^e No hurts or wounds must be inflicted, and this is achieved if there be a knowledge of how to give way and to control anger, on both sides, and especially on the part of the younger or otherwise inferior in station. In return, elders must admonish only with the greatest regard for the words they use, and they must allow solicitude and friendliness to appear in what they advise. This alone makes admonition both seemly and beneficial.^f

Rules for the preservation of true friendship are: Never destroy trust in friendship, either in jest or in earnest. Never repudiate a friend because of his worldly misfortune, the only justification is incorrigible wickedness. Never willingly assume an enmity against anyone not wholly bad, but if you do so, stand to it bravely in the conflict, unless the adversary changes his ways. Fight not with words, but with action. The enemy has a claim to regard, if he fights as human being to human being. Never be the cause of a quarrel. In friendship, let all rules be carefully defined and observed, so that no association is treated lightly, but rather with respect, agreement and due arrangement, and no unworthy emotion such as desire or rage is kindled.^g Rivalry was discouraged by the ascription of all discoveries to Pythagoras, and this was done, except in rare cases.^h

True love of beauty has as its object good conduct and the pursuit of knowledge, not objects used in daily life, as the common herd believes.ⁱ

In spite of the rule of harmony, chance exists. But chance, too, has a divine and a natural side. The divine sort is that by

^a B^b Ch 55^c Ch 54
^h 6^d 58D7
ⁱ 10^e 6^f 9^g 9

which a kind of breath from the Divine drives certain mortals towards the better or the worse, so that they are obviously lucky or unlucky. The natural kind is that by which some are born beautiful or clever, while others are the opposite, so that some succeed in all their aims, while others fail.^a

E *Pythagoreans in Middle Comedy*

The Pythagoreans did not escape the attentions of the comic playwrights. Cratinus (c. 490-20 B.C.) wrote a play called *The She-Pythagorean*, and another called *The Tarentines*, and these subjects were taken up later by Alexis, the most prolific writer of Middle Comedy (c. 390-287 B.C.). Other fourth-century writers who mentioned them were. Aristophanes, who wrote a play called *The Pythagorist*, Mnesimachus in *Alcmaeon*, and Antiphanes in *Recollections*.

The surviving quotation from Cratinus is comparatively inoffensive: it pokes fun merely at Pythagorean powers of debate, and their strange jargon of 'Opposites, Limits, Equivalents, fallacies, quantums', which they use in a way 'bursting with brains'. But when Middle Comedy takes over the subject, the jokes become coarser: the Pythagoreans, like other philosophers, are accused of being dirty, lousy, ill-dressed, unshod and hypocritical. Their way of life seemed gloomy to the worldlings, with its 'shortage of food, cold silence, lack of baths' ^{b, b¹}. Their frugal diet, with its ban on meat and wine, was sneered at as 'prison-fare', water, black bread, lettuce, dried figs, olive-cake and cheese are mentioned, as well as spinach gathered from the river-bed, but it is confidently asserted that the dirt, rough garment and lack of food were merely an excuse to cloak their poverty, and not obligatory: 'put in front of them fish or meat', says a character in *The Pythagorist* of Aristophanes, 'and they'll gobble it up and their fingers too, or may I be hanged — a *decad* of times!' ^c. Their refusal to eat 'living' food also comes in for comment ^d.

Theocritus in the Fourteenth Idyll^e (the date of which is after 269 B.C.) brings in a 'Pythagorist' from Athens, pallid

^a 11 ^b 1 ^c 2 ^d 1, 3 ^e 1 5

^{b¹} Alexis, Frg. 370. Norwood paraphrases 'No dinner, no soap, no fire, no conversation, no bath' (*Gk. Comedy*, p. 47).

and barefoot; the language strongly recalls that used of the 'thinkers' in the *Clouds*^{a, a1}. The scholiast remarks that the real Pythagoreans took every care of the body, and distinguishes them from the 'Pythagorists', an inferior class who followed a mean and dirty régime. He is of course mistaken in taking the designation 'Pythagorist' seriously, this was merely a contemptuous word coined by the comic writers for the whole sect. The comic writers no more distinguished between the best and the worst members, the scientists and the cranks, than Aristophanes did between Socrates and the lowest of the Sophists.

59 ANAXAGORAS

ANAXAGORAS OF CLAZOMENAE was in his prime about 460 B.C.

That Anaxagoras was a native of Clazomenae is universally agreed. The date of his birth is given as 500 B.C., and he is said to have come to Athens at the age of twenty^b. He was already, as his meteorological theories show, strongly influenced by the Milesian school, especially by Anaximenes, he is said by some to have been Anaximenes' pupil,^c but it seems more likely that he received this instruction at second-hand, when refugees from Miletus in 494 B.C. spread over Ionia.

Anaxagoras died at Lampsacus in 428, having been exiled from Athens a few years before^d. There were divergent opinions regarding these dates, the archonship-date of his arrival at Athens was sometimes given as Callias (456 B.C.), in mistake for Calliades^e (480 B.C.), and the date of his death was given as 460 B.C., the year of an eclipse which he foretold.^f It was also said that he lived at Athens for thirty years,^g which, if the date 480 be accepted for his arrival, would make his departure take place in 450. This seems too early. there is a strong tradition that the attack on Anaxagoras which led to

^a v 103^b A1 §7, A4^c A7, A1 §6, A2^d A1 §7, A3, A42 §13^e A1 §7^f A18, A4^g A1 §7

^{a1} Theocr. XIV, 5 Πυθαγορικτάς, ὥχρὸς κἀνυπόδητος *Clouds*, 103 τοὺς ὠχρῶντας τοὺς ἀνυποδήτους λέγεις

his exile was an incident in the political drive against Pericles just before the Peloponnesian War. The dating of his exile in 450 B.C.¹ seems to be due to a confusion between his case and that of Damon, another of Pericles' teachers, who was ostracized in the middle of the century. The word 'ostracism' is used once of Anaxagoras,^a but this method cannot have been applied to him, because he was not an Athenian citizen. Those who thought that he was 'ostracized' around 450 B.C. arranged for his recall, no doubt in order to satisfy the tradition that he was in Athens at a later date: for instance, according to the Marmor Parium, he was still there in 442 B.C., the year in which Euripides won the prize for tragedy for the first time.^b The only other date mentioned in his life is that of the fall of a meteoric stone at Aegospotami in 468-7 or 467-6, which he is said to have foretold.^c

It would seem that the date 480 B.C. for his arrival at Athens is open to suspicion. One might conjecture that he first came into prominence in 468-7 B.C., in connection with the meteoric stones which fell at that date and caused a great sensation, that Pericles then heard of him and invited him to Athens, as he did other men at this period, for instance Cephalus the father of the orator Lysias, that Anaxagoras came between 465 and 460 B.C. and lived there for thirty years,² until his exile between 435 and 430. His powerful influence on the Periclean circle, including Euripides, would then be more readily explained.

The reason why he left Clazomenae is not recorded. This town had been reduced by the Persians during the Ionian revolt, so that his family may have left to avoid Persian rule.³ There is a tradition that he was of good family, but relinquished his property because of a complete lack of interest in

^a A19 ^b A4a ^c A11

¹ Burnet EGP⁴ accepts the date 450, he points out that Plato never makes Socrates meet Anaxagoras, but says he read his book, whereas if Anaxagoras had been in Athens, Socrates could have discussed the point with him. But Socrates is supposed to have read A's book in his youth, perhaps A would not then have been willing to receive him. He did not receive Democritus, tradition says (68A1 §36, 68B5).

² The 'thirty years' may be invented by analogy with Cephalus Lysias, *c* Eratosth XII, 4.

³ Burnet suggests that Anax was in the Persian army, basing this conjecture on the expression of Apollodorus that A was 20 years old κατά την του Ξέρξου διαβάσιν, and inferring that A must have been with Xerxes on this occasion (EGP⁴, p. 254, n. 1). This assumption seems groundless: the 'crossing of Xerxes' was a convenient date, and implies nothing as to A's participation, apart from other obvious reasons for dismissing this idea.

worldly affairs;^a but this merely expresses the average Athenian's view of him as a crank.^b He may have travelled for a time.^c He then came to Athens, and lived as a resident alien, studying and writing, and mixing with a select circle only. His chief pupil and protector was Pericles,^d he also had a great influence on Euripides,^e and on Archelaus,^f but with Democritus he had some quarrel.^g

After thirty years of undisturbed residence, he was impeached by Diopiteus,^h or, some said, by Cleon,ⁱ or by Thucydides,^j the politician. The charge was impiety in particular the statement that the sun and moon were material bodies, not deities. There were various accounts of the result.^k The best tradition seems to be that he went into voluntary exile, or was sent away by Pericles, before he could be brought to trial, some added that he was condemned to death in absence. Others stated that he was brought to trial, defended by Pericles, and fined five talents as well as exiled, others that he was condemned to death, but released before execution through Pericles' pleading, and exiled, others that he suffered a long imprisonment before the trial, and when brought to trial was in so pitiable a state that he was acquitted. The stories of a trial seem to be an embroidery of the facts, and perhaps an endeavour to bring Anaxagoras' fate into relation with that of Socrates.

He then left Athens and retired to Lampsacus, where he taught until his death a few years later.^l His dying request, that the children should be given an annual holiday in the month of his death, was observed by the magistrates,^m and he was also honoured after his death by the dedication of an altar to him.ⁿ The custom of the children's holiday at Lampsacus was maintained for many years; and later his native city Clazomenae assumed his portrait as the type of their coinage.^o

His lack of interest in worldly things, and concentration on his astronomical studies, were an object of wonder to some anecdotists, he was credited with the belief that abstract thought and the freedom which it brings comprise happiness.^p His fortitude over personal bereavement was embodied in several stories, the detachment he thus reached was said to

^a A1 §6, A13, A31 ^b A30 ^c A10 ^d A15, A32 ^e A7, A20a, b, c, A33
^f A7, A26, A62 ^g 68B5 ^h A16 ⁱ A1 §12, A20 ^j A1 §12
^k A17, A18, cp A1 §12, A3 ^l A1 §14, A3 ^m A1 §14
ⁿ A23, A24, A1 §15 ^o A27 ^p A30, A29

have been the result of a special kind of spiritual exercise called Preacclimatization,^a which interested Euripides. His character, as well as his metaphysical views, earned him the nickname Nous,^b and his sobriety of manner was by some exaggerated into an inability to laugh or even smile.^c He was perhaps caricatured on the comic stage.^d He evidently made a number of enemies, Aristotle mentions Sosibius as a rival,^e and his attitude towards divination may easily have annoyed seers like Lampon.^f There is also a suggestion that he incurred the enmity of Democritus, who was forty years his junior, because he failed to receive him.^g

The forecasts attributed to Anaxagoras are meant to be illustrations of the power of science as opposed to divination.^h

Anaxagoras is classed with those who wrote only one book.ⁱ It was said to have been well-written, and its views expressed clearly and boldly.^j It was in some respects the first of its kind,^k and it enjoyed such popularity that it was available in a cheap form: by the end of the fifth century it was on sale in the Orchestra at Athens for one drachma,^l and its contents were generally known. Suggestions of other works are not confirmed by the existing fragments. He may have embodied in his book some remarks on perspective, this had been the subject of a commentary by Agatharchus, who had 'mounted' a play of Aeschylus,^m and it must have attracted the attention of philosophers because of its bearing on illusion and sense-perception. The book of problems called *The Goose* is thought to be the work of another Anaxagoras, and the treatise on the squaring of the circle which some said he wrote in prison is probably an invention.^{n, n1}

Of the surviving fragments of his work, almost all are quoted by Simplicius, and apparently from the First Book only. Though at first sight clear, they contain several ambiguities, especially of terminology, and have aroused much controversy both in ancient and modern times.¹

^a A3j ^b A1, A2, A15 ^c A21 ^d A22 ^e A25 ^f A16 ^g A1 §14, A5

^h A1 §10, A6, A10, A11, A12, cp A42 §1j ⁱ A37 ^j A1 §6, A18

^k A1 §11, cp A36 ^l A35 ^m A39 ⁿ A40, A38

ⁿ¹ Cp Plut. *De Exilio* 607f, and Burnet EGP⁴, p. 257, note 5

¹ The following account owes much both to Burnet EGP⁴, and to F. M. Cornford, *Anaxagoras' Theory of Matter*, Classical Quarterly, 1930, an acceptance of the interpretation of the latter seems to me necessary to an understanding of A's metaphysics. Cp also C. Bailey, *Epicurus and the Atomists*.

There are two chief factors in Anaxagoras' system Mind and Matter.^a The former is described clearly and unambiguously, within the limits of his terminology; the latter bristles with difficulties.

The Parmenidean proposition that there is no Void, or Not-Being, is accepted;^b and the further proposition that nothing can come out of nothing.^c This latter proposition is expanded. the Greek notions of 'coming into being' and 'passing away' are mistaken, and for them should be substituted 'mixing together' and 'separation'.^d Further, there is no changing of one thing into another only combination and separation of their constituents. So far, these are the views of Empedocles, adopted in order to explain the visible world while not denying the logic of Parmenides. But Anaxagoras offered a different theory, which was to account both for the diversity of things in our world, and also for the apparent change of one thing into another, whether this change took place in inorganic matter, or organic matter (growth)

The elements from which all substances are made (that is, simple substances like gold)^e are particles infinite in smallness, and therefore imperceptible except in coagulation.^f A substance like gold can be infinitely sub-divided,^g and the result however small will be a particle of gold. The Fire, Earth, Air and Water of Empedocles are not themselves elements, but are each made of innumerable coagulated particles of Fire, Earth, Air and Water, and other simple substances.^h Even among these particles, that is, of gold or earth, no two are exactly alike, they are similar because a certain quality predominates in each of them, so that in coagulation they take on a particular appearance.ⁱ In organic substances, there are two factors: growth and nutrition. The germ of an animal, or of a plant, must contain all the ingredients of the developed product, the animal: flesh, bone, veins, sinews, hair, nails, and perhaps feathers and horns, or the plant: wood, leaves, fruit,^j or else it must acquire them from the particular nutriment, bread or water (or whatever it may be) since nothing can come from nothing.^k So that, to make up the composite animal, the germ

^a A42 ^b A68, A45 ^c A46, A52 ^d B17, A43, A45, A46, A52 ^e A158, B1

^f A44, B3 ^g A43, A41 ^h B4 ⁱ A45 ^j A46, A45, B10

^k Composite inorganic substances are not specifically mentioned, he must have known of them, e.g. electrum (a mixture of gold and silver), bronze (copper and tin), and thought them too obvious to require explanation

of Bread (that is, corn), itself composite, is added to the animal-germ, and the result is a separation-out or articulation of the various 'simple' organic substances bone, hair, flesh and the rest. He seems to have given the name 'seeds' to all the particles of what he considered simple substances, organic or inorganic, transferring the natural term from the former to the latter. The particles of such substances are called by Aristotle *Homoiomerê*, it seems that Anaxagoras did not use this term. His 'seeds' are the infinitely small particles, alike but not exactly alike, which when coagulated give a 'simple' substance like flesh, hair, bone, gold. What we call a 'seed', of an animal or plant, must already be composite, containing the particles of all the substances which subsequently develop from it.

The elementary particles are alike, but not exactly alike.^a Yet each contains a portion of everything.^b This puzzling statement used to be taken to mean, not only that bread if analysed would be found to contain bits of bone, flesh, hair and so on, but that *all* substances if analysed would be found to contain bits of all other substances. This would reduce Anaxagoras' metaphysic to absurdity, for he would merely have postulated in the sphere of the elements the same diversity as is found in our world, without explaining either. But it is clear from the fragments that by 'things' in this connection he means 'qualities', and is endeavouring also to express the relative nature of qualities. For instance, everything 'contains a portion of' great and small,^c that is, it can never be called absolutely 'small', but only 'smaller' or 'greater' than this or that other thing. He applied this reasoning to all the qualities: the range hot-cold, light-dark, wet-dry, in fact, to all perceptibles, including shapes, colours, tastes. So that in one sense the particles themselves 'contain' these qualities, and each contains all of them, but no two are alike, because though each particle contains a portion of wet-dry, hot-cold, and the rest, the proportion of wet-dry, hot-cold, and the rest, is different in every case.^d Therefore the particles or ultimate 'seeds' are infinitely infinite, both in number and in individuality.^e

These particles are indestructible and unchanging, and their quantity never varies,^f that is, they never become less than infinite in number. The opposites which go to make up a quality cannot exist alone, each must always be relative, that

^a B4^b B6, A44, A45^c B3^d B12^e A45^f B5

is, in combination with its opposite; there is no 'greatest' or 'least', only 'greater', which implies 'smaller', and cannot exist without it, or 'lesser' which implies 'greater'.^a The opposites cannot be severed as if with an axe, so that the 'things' making up any elemental particle cannot themselves be dissected, and cannot therefore be regarded as elements. Anaxagoras also applied this reasoning to the category heavy-light, and to colours — white-black^b — saying that where one was, the other must be, and giving as a proof the apparent change of 'black' water into white snow and vice versa.

So much for Matter. The other factor was Mind, which was quite apart from Matter, and 'contained' no 'portion' of anything,^c that is, had no perceptible or material qualities. He proceeds to describe it as the finest and purest of all things — the term 'finest' suggests matter, but as he uses a superlative he is obviously trying to describe something quite outside the material category dense-rare, for in that range there is no 'rarest' but only 'rarer'. The 'purity' of Mind lies in its not being mixed with anything, but being apart. This gives it complete knowledge of matter, as well as complete power over it, which would be impossible except from a position of independence.^d It is the source of motion and of life.^e

The cosmogony is as follows: there was a period before the creation of the Cosmos, in which 'all things were together', that is to say, the infinite number of infinitely diverse particles were mixed and motionless.^f This mixture had the predominating character of Air and Aether^g (which he equates with Fire)^h because the particles in which the Air-qualities and Aether-qualities predominated were more numerous and larger than the rest, in fact, both were infinite in quantity.ⁱ But though all other qualities were present, that is, particles in which other qualities predominated, they were not numerous enough to affect the mass, and could not be perceived because of their smallness.^j

Then, in some unexplained way, at an unspecified time and for no specified reason, Mind, separating off from the Whole,^k set up a circular motion at one point, this was at first local, but it gradually spread and still is spreading.^l Air and Aether separated off from the mass, that is to say, the particles in

^a B6 ^b B10 ^c B12 ^d B12 ^e A41, B12, A1 §98 ^f B1, B4, A43/fin
 ^g A1 ^h A73 ⁱ B1 ^j B4 ^k B13 ^l B12

which the qualities hot, rare, dry predominated separated from those in which cold, dense, moist predominated.^a There is of course no complete separation of hot-cold and the rest, because the particles on the cold side still have their portion of hot, that is to say, they are not absolutely cold — there is no such thing — but colder^b Every hot particle is different from every other hot particle by the degree of heat in it, and so on.

The relatively hot, rare, dry particles separated off to the outer part of the revolving mass, and the cold, dense, moist settled inside.^c The force that separated them off was speed — a speed far greater than anything we know^d From the latter, when separated off, Earth solidifies, for water separates from the clouds, and earth separates from the water.^e The earth is flat, and floats on air.^f From the earth, stones are solidified by the cold, and as the rotatory motion continues, they are flung outward towards the Aether^g Then they are carried round with it, and become the sun, moon and stars, together with other unseen bodies,^h so that sun, moon and stars are not in the places in which they were created, for they are stony and heavy, and shine by reflection of the Aetherⁱ In fact, the sky is made of stones held together by the swiftness of the revolution, and if this were relaxed, they would fall down^j This theory was a development of that of Anaximenes, and was substantiated for Anaxagoras by his knowledge of the fall of a large meteoric stone^k When the sun, which is therefore a red-hot mass larger than the Peloponnese,^l is in position in the sky, it begins to vaporize the water which lies on the flat earth, and the part left behind is the sea^m The heat of the stars is not felt because they are farther away, and inhabit a colder regionⁿ The moon also is a stone, but gets its light from the sun,^o and is the cause of eclipses of the sun^p Eclipses of the moon are due to interposition of the earth between it and the sun, or sometimes to the lower, invisible bodies.^q The moon, like the earth, is flat, with mountains, plains and ravines, and even rivers and houses.^r It has life the Nemean lion fell from it^s

Animals were created by the fall of 'seed' from heaven to

^a B15, B12 ^b A53 ^c B15, A42 ^d B9 ^e B16 ^f A42 §3, A88

^g B16 ^h A42 §6 ⁱ A12, A71 ^j A1 §12 ^k A10, A11, A12

^l A1 §8, A2, A3, A19, A20a, A35, A42 §7 ^m A1 §8 ⁿ A42 §7

^o B18, A76

^p A42 §8

^q A42 §9

^r A77

^s A77, cp jB2 (above, p 30)

earth, and afterwards by reproduction.^a The seeds of plants were likewise in the air, and were washed down by rain on to the ground, where they took root, and became 'living things attached to the ground'.^b Plants have sensation, and feel grief (and pleasure), a sign of the former being the fall of their leaves in winter.^c They have, in fact, a portion of Mind in them, for though Mind itself is mixed with nothing, it is in some things, that is, those which have life.^d Yet this does not mean that all living things have intelligence, or even all human beings, they may have it and not use it, or have it only in its non-intellectual form, as a kinetic force.^e

Such is the story, in outline, of the creation of the Cosmos. It was not always fully understood, but the theory of the Seeds or *Homoiomerê* was recognized by Aristotle as an original attempt to solve the problem of existence, if one could disentangle what Anaxagoras meant.^f The belief, however, that food contains animal organic material like blood was challenged by medical men like Galen, who pertinently asked whether the blood was not rather manufactured in the body.^g The theory of Mind as the creative force, or moving cause, met with more criticism: it was a promising suggestion, like that of a sober man among random babblers, Aristotle thought,^h but it was a pity that having dragged Mind in to start the cosmic revolution, he no longer used it as an intelligent creator or 'arranger' of the Cosmos, but explained the rest of creation in a mechanistic way. The promise with which Anaxagoras' book began was therefore not fulfilled, according to both Plato and Aristotle.ⁱ But Anaxagoras would have been able to defend himself from this criticism: he expressly says that Mind not only started the creative 'eddy', but is responsible for what is and what shall be.^j Its rule continues,^k because the creative development continues on the lines originally laid down. Mind itself is eternal, existing both outside the Cosmos and inside it, in the surrounding region and in the part 'separated off';^l and its rule is extending further.^m When once things are started off according to an intelligent law, the rest follows automatically, and there is no need for Mind to interfere further. It understands and has power over all things, and that makes it divine.ⁿ

^a A113, A1 §9 ^b A117, A116 ^c A117 ^d A99, B11 ^e A100, A101a

^f A 61 ^g A104 ^h A58 ⁱ A47, A59, A57 ^j B12

^k A64 ^l B14 ^m B12 ⁿ A48, A49, cp A55

He filled out the details of the Cosmos with explanations of all phenomena which interested the scientists of his day. He was fully aware that neither sun, moon or stars were living creatures or anything else but material objects; and he knew that whereas the sun and stars shone with their own light, that of the moon was borrowed.^a His reason for describing the sun as 'bigger than the Peloponnese' was doubtless his belief that meteoric stones fell from a whirling mass of stones in the sky, and that of these the sun was the largest. It was his way of describing a stone enormously larger than the one he had actually seen. The sun's tropic was explained by air-resistance: the sun itself drives air along with it, and it is itself retarded and turned back by it.^b The stars which originally moved 'round', later took an inclination,^c or as others put it, the Cosmos took an automatic slant after the creation of animals, perhaps in order that some parts might be uninhabited, others inhabited, according to climate and temperature.^d All stars are carried from east to west,^e and move under the earth.^f The Milky Way is produced by the light of stars which are in earth's shadow when the sun passes below the earth, so that their light shows up and is not quelled by the sun's rays.^g

Comets are a concatenation of planets.^h Shooting stars are broken off from the aether-like sparks, and are immediately quenched.ⁱ The phases of the moon are caused by the sun, from which it gets its light, he wrote on this subject, as on eclipses, in some detail, and was the first to deal with it thoroughly and clearly,^j though his views were based on the work of his predecessors.^k The progress of sun and moon is connected,^l and this is the reason for the regularity of the moon's phases, but though he gave a true explanation of eclipses of sun and moon, he felt unable to dispense with the assumption that there were lower bodies travelling between Earth and Aether, which accounted for some of the eclipses.^m The moon, like the sun, has its 'tropic', or point at which it seems to turn in its path; this also is accounted for by air-resistance, but the moon is less able than the sun to resist the accumulation of cold, and so it 'turns' in its path more frequently than the sun.ⁿ

^a B18, A77, A79, A80 ^b A72, A42 §9 ^c A1 §9 ^d A67 ^e A78
^f A42 §8 ^g A80, cp A1 §8, A42 §10 ^h A81, A83, A1 §9 ⁱ A82, A42 §10
^j A42 §10, A77, A18 ^k A5 ^l A75 ^m A42 §6; A77 ⁿ A42 §9

The flat earth is maintained in the middle by the force of the eddy going on round it, the same force that originally caused it to settle in the middle, as large bodies do in a whirl-pool of liquid or eddy of air ^a It can, however, be disturbed when the air which buoys it up on the under side rises through heat, and impinges on it, causing it to 'toss' like a ship on the sea;^b the result is an earthquake The heat below the earth which causes earthquakes acts in a way similar to that which breaks through the clouds above us and produces thunder and lightning ^c

Wind and rain are explained by the movements of air through its being heated and cooled ^d Clouds and snow are explained in the same way as by Anaximenes ^e Hail is caused by the squeezing out of moisture from a dense cloud the drops are frozen and rounded during their descent.^f The condensation of the cloud is caused by its being driven up by the refraction of the sun's rays from the earth, into a colder region; hence hail often occurs in summer, and in hot places The movements of air greatly interested Anaxagoras his experiments with the water-clock, elaborating those of Empedocles,^g proved that atmospheric air was a real substance, and he added to this the observation that air rises in the heat, by watching motes dancing He thought that the air actually sizzled as it rose, making hearing by night easier than by day ^h Lightning and thunder were explained as the descent of fire from the upper aether the flash as it comes through the clouds is lightning, the sound of its quenching is thunder Other more violent phenomena depend upon the quantity of fire which descends ⁱ The rainbow is the reflection of the sun's rays from a thick cloud.^j

The saltiness of the sea was explained by the percolation of water through the earth, which contains salt (salt and soda, for instance, are mined from the earth),^k this process is helped by evaporation.^l The flooding of the Nile in summer is due to the melting of snow in the Aethiopian mountains: the correct explanation has now become established, in spite of its dismissal by Herodotus.^m

^a A88, cp A42 §3 ^b A89, A42 §12, A1 §9 ^c A89 ^d A1 §9, A42 §11, A86a

^e A85, 13A7, 13A17 (p 72 above)

^f A85

^g A69

^h A74

ⁱ A84, cp A1 §9

^j A86, B19

^k A90

^l A90, A42 §4

^m A91, A42 §5

Animal-life and plant-life arise in the first instance from seeds containing hot and cold and earthy, and afterwards from one another.^a The males then produce the seed, the females the breeding-ground.^{b, b1} There is also a Pythagorean suggestion that 'males come from the right, females from the left', and this is taken by some to mean that males are generated on the right-hand side of the womb, females on the left.^c He suggested that in some animals and birds (the crow, ibis and weazel are named) copulation took place by the mouth, an idea which is ridiculed by Aristotle.^d Like earth, the mother is the source of food, and food is administered to the embryo by the umbilical cord.^e The brain is first developed, for all the senses derive from it.^f The disposition of the limbs is caused by the aetherial fire inside.^g

In birds' eggs, the white is the embryo's food he called it 'birds' milk', thus likening it to the food provided for animal young.^h

All things breathe, even sea-creatures. Oysters and fish blow out water from their gills and breathe in air which is in their mouths, so that there is no vacuum.ⁱ

A plant is a living thing attached to the ground.^j Their food-principle is earth, and for the generation of their fruits, the sun; so that the sun is the father, the earth the mother.^k They have intelligence, and feel grief and pleasure.^k The proof of this, that they shed their leaves in winter, seems to ignore the non-deciduous trees.

Man, he thought, acquired intelligence because he had hands. Aristotle combats this idea, and says that hands were given to Man as tools, because he had intelligence.^l But Anaxagoras believed that the brain developed first in the embryo.^m There is a story of his dissection of a ram's head to prove that the reason for its having only one horn was a malformation of the brain.ⁿ He studied the pathology of disease; he believed that the worst human diseases were due to an excess of bile, which escapes into the lungs and veins.^o

The following is, according to Theophrastus, his theory of

^a A113, A117, A1 §9, A42 §12 ^b A107 ^c A107, A1 §9 ^d A114

^e A110 ^f A108 ^g A109 ^h B22 ⁱ A115 ^j A116 ^k A117

^l A102 ^m A108 ⁿ A16 ^o A105

^{b1} Censorinus' statement (A111) that children inherit the appearance of the parent who contributed most seed is wrongly attributed to Anaxagoras, according to whom only the father contributed seed (A107)

sense-perception: sense-perception occurs through the meeting of opposites.^a Sight is due to an image or reflection of the pupil of the eye, but the reflection does not show up against a colour like that of the eye, but against a different colour. For most people the 'like' colour is night (most eyes being dark) the 'unlike' is day, so that they see better by day than by night, though there are exceptions. Further, the light itself is a contributory cause of the 'reflection', a colour always shows up best on its contrasting colour. A similar explanation is offered for touch and taste: hot and cold, sweet and bitter, are not recognized by their likes, but by their opposites, because of a lack in each instance. All of these things are present in us, but there can be a shortage of one or the other. Smell accompanies breathing, hearing is due to a sound penetrating to the brain, for sound is produced by moving air. Voice, for instance, is produced when breath collides with 'solid', that is, compressed air, which is turned back like an echo, and reaches the ears of the hearers.^b

All perception is accompanied by pain, for unlikes when they meet cause distress. This becomes clear through the duration, or the excess, of the sensation. Bright colours and loud sounds give pain, and we cannot bear them for long.

The larger the animal, the greater the powers of perception: the animals with large clear bright eyes see farthest, those with small eyes have the nearest sight. So too with hearing: the larger animals hear the furthest sounds, the smaller hear those near at hand. The same applies to smell: air smells most when heated and rarefied, but the larger animals are able to take in dense air as well as rare, whereas the small ones get only the rare air from which the smell has been scattered and weakened.

Sense-perception, however, cannot judge of exact truth.^c It cannot, for instance, discern a gradual change of colour,^d or the presence of the opposite colour such as black in white.^e But the senses are not entirely misleading, their evidence must be used in order to arrive at the truth: to see the invisible, we must use the visible.^f Cicero was wrong in including Anaxagoras in the list of agnostics,^g though he thought that certain things could not be grasped by us, for instance, the infinite number of the particles which separate off from the Whole,^h

^a A92, A94^b A106^c B21, A96^d B21^e A97, A98^f B21a^g A95^h B7

Mind alone knows everything. All living things, even plants, have a share of Mind, though as a reasoning factor it is not present even in all human beings,^a or is perhaps not used.^b Whereas animals have the advantage over man in strength and swiftness, man is superior to them in 'experience, memory, wisdom and skill' ^c To his pupils Anaxagoras said that things would be to them as they supposed,^d meaning apparently that their grasp of reality would depend on the intellectual equipment they could bring to bear upon it, and that this in its turn depended on their natural endowment — their 'composition'

He equated the 'soul' with life,^e it is that which causes motion in the organism, just as Mind did in the Whole.^f It has two forms, the moving and the knowing ^g It is unlikely that he said it was air, as Anaximenes did,^h and certain that he did not say it was immortal,ⁱ except in so far as it was part of the universal life-force, Mind. The particular consciousness ceases to exist when the soul leaves the body,^j the period before birth teaches us about death, and so does sleep,^k though sleep is purely physical, due to weariness,^l and does not involve the temporary departure of the soul from the body, as some have thought

There was a suggestion in Favorinus that Anaxagoras was interested in Homeric studies, especially in the ethical content of the poems; and that he influenced Metrodorus of Lampascus, who studied the scientific content.¹ Nothing else is known of this, it may have been a hobby of Anaxagoras' retirement

Anaxagoras appears to have believed that our Cosmos is not the only such universe created by Mind: there have been other separatings-out, which have produced men and all other creatures that have life, and the men possess inhabited cities and artificial works just like ours, they also have sun, moon and the rest, just as we have, and the earth produces many diverse things for their use ^m His choice of tenses, as Simplicius remarks, shows that these worlds are regarded as contemporary with ours. Mind started other rotatory motions in the mixture, apparently simultaneous with ours, and this led to similar developments elsewhere.ⁿ

^a A100^b A101a^c B21a^d A28, cp 28B16^e B4^f A99^g A101a^h A93ⁱ A103^j A34^k A103^l A1 §11^m B4ⁿ B4

60. ARCHELAUS

ARCHELAUS of ATHENS was in his prime about 450 B C

Archelaus was an Athenian,^a apparently of Milesian origin,^b the son of Apollodorus, and pupil of Anaxagoras.^c He is said to have been the first to bring Ionian physical speculation to Athens,^d a distinction which in fact belongs to Anaxagoras, but the statement can be taken to mean that he first gave regular instruction in the subject which he had learnt from Anaxagoras. It was he who taught Socrates this subject, the value of which Socrates is said both by Xenophon and Plato to have denied. Archelaus is said to have lived with Socrates for many years, and to have reformed his character, which was somewhat wild in youth, as well as made a philosopher of him. The association began in Socrates' seventeenth year, and included a visit to Samos, but we are not told how it ended.^e It is possible that this account is in part an invention, on the analogy of Socrates' reforming influence on Alcibiades: there were some who wished to prove that there had been a time when Socrates himself had needed reforming. Physical speculation is said to have ceased at Athens with Archelaus, for his pupil Socrates went over entirely to ethical philosophy,^f a study which Archelaus also had pursued along with physical science.^g Archelaus left Athens with his master, for he is said to have succeeded Anaxagoras as head of the school founded by the latter at Lampsacus.^h

Archelaus is credited with a prose work on physical science, called *Physiologia*, of which only one sentence of four words survives.ⁱ He is also said to have written an elegiac poem of condolence for Cimon son of Miltiades, on the death of his wife the Thracian princess Hêgêsipyia.^j

In general, his views were much like those of Anaxagoras, though he tried to introduce original features into his cosmogony, and other details.^k His elements were the same; the *Homoioomerê* or *Homoiomereiai*, particles of matter infinite

^a A1, A4, A5, A6, A7^b A1, A2^c A1, A2, A5^d A1, A2^e A3, A1 §16, A2, A5, A7^f A1 §16^g A6, A1 §16^h Euseb PE p 504, c3, A10ⁱ B2^j B1^k A5

in number, differing in kind, and eternal.^a They produce everything by mixing and separation, and the first result of this is the separation of Hot and Cold, which some commentators say he regarded as the 'causes of Becoming',^b or even as elements.^c The Hot was in motion, the Cold was motionless.^d Other commentators suggest that he gave Air as the substrate, from which Fire and Earth separated by rarefaction and condensation,^e or that he said that all things came from Earth.^f There can be no doubt, however, that he began with the *Homoiomerê*, or seeds, and the initial division into Hot and Cold, following Anaxagoras from beginning to end. The only original feature at this stage appears to be his statement that Mind was not the creator of the universe, though it is a part of the divinity,^g and that it was not 'apart', as Anaxagoras said, but itself contained some of the mixture.^h He thus removed Mind from its position as moving cause, and preferred to regard the motion which caused the creation of the Cosmos as being due to 'heat and innate life'.ⁱ Like Anaxagoras, he believed that there were numerous universes, one being formed with every rotatory movement set up in the mass of particles.^j

His cosmogony is as follows:^k after the separation of Hot and Cold, water liquefied out of the latter and flowed into the middle, where being 'burnt up', it turned into air and earth: the former rose, the latter fell. This was the cause of the creation of Earth, which lay motionless in the middle, being only a very small part of the whole. Round it flowed water, and the whole was dominated by air. From this (the earth, or perhaps the air: the reading is uncertain) came the material of the stars, of which the biggest is the sun, the next biggest the moon, while the stars differ in size. The heavens then took on a slant, and the sun gave light on the earth, clarified the air, and dried the land. The earth was at first a lake, it was not flat as Anaxagoras thought, but concave, the proof of this being that the sun does not rise and set at the same time for everyone, which it would do if the earth were flat.

His explanations of storms and earthquakes seem to be similar to those of Anaxagoras. He likened the thunderstorm to the effect produced by the plunging of a red-hot stone into cold water,^l and he added to Anaxagoras' explanation of earth-

^a A5, A4 §1, A10^b A1 §16^c A8^d A4 §2^e A7^f A9^g A12^h A4 §1ⁱ A14^j A13^k A4 §2, A1 §17^l A16

quakes by saying that the air impinging on the under side of the earth's surface is trying to find room, and rushes through narrow passages. Hence, he said, earthquakes are preceded by a calm, for the force which stirs up winds is detained in the region below ^a

The only surviving sentence of Archelaus' scientific work gives the reason for his belief that the earth is motionless: it occupies the coldest region, and so 'coldness is its bond' ^b

His biological views^c differ from those of Anaxagoras, and appear to go back to Anaximander. He says nothing of seeds which fell from heaven, generating the first life, but states that the earth was heated underneath, and from the slime animals were generated. This slime provided their food at first, like mother's milk, and this was their only diet, the same for all. They were short-lived. Later they reproduced from one another. Human beings were separated off from the others, and they proceeded to develop civilization: rulers, laws, arts, cities and so on. Mind is implanted in all things that have life. Every animal, no less than Man, uses intelligence, some more slowly, others more quickly.

Of his ethical views, nothing is preserved, though he is credited with the sophistic theory that good and bad exist not by nature but by convention ^d

61 METRODORUS OF LAMPSACUS

METRODORUS OF LAMPSACUS lived in the second half of the fifth century B C

Metrodorus of Lampsacus, a friend and follower of Anaxagoras, applied physical theories to the interpretation of Homer,^e following on a line suggested by Anaxagoras ^f

He interpreted all Homer's personages, both human and divine, as allegorical representations of natural substances, or arrangements of the elements.^g Agamemnon, Achilles, Helen and Paris were Aether, the Sun (Fire), Earth and Air respectively, and Hector the moon ^h. He likewise dealt with the deities, saying that Zeus, Hera, Athene and the rest were not

^a A 16a

^b B 2

^c A 4 § 5, A 1 § § 16, 17

^d A 1 § 16, A 2

^e Cp ch 8 (Theagenes)

^f 2

^g 3

^h 4

at all what their worshippers imagined ^a The lesser deities, Demeter, Dionysus and Apollo, were said to represent parts of the body: liver, spleen and gall.^b

He may also have busied himself with Homeric grammar ^c, ^{c1}

62 CLEIDAMUS

CLEIDAMUS. birthplace and period not recorded, but his work shows that he belongs to the fifth century B.C.

It is clear that Cleidamus belongs to the fifth century, since Theophrastus deals with his views between those of Anaxagoras and Diogenes. There is no ground for identifying him with the Attidographer of the same name.

Of his meteorological speculations, the only relic is a conjecture that lightning is an appearance only, as when at night the sea is struck with a rod and gives out a (phosphorescent) flash.^d This is reminiscent of Anaximenes, who likened it to the cleaving of the sea with an oar-blade ^e

His views on sense-perception ^f were original in some respects: he said that the eyes possessed vision merely because they were transparent. Similarly ears, nose and tongue perceive because they admit the object of perception: the tongue can taste and feel because it is porous. The rest of the body feels only hot, wet and their opposites. Of the senses, only the ears do not distinguish between sensations but send these to the Mind, he does not place Mind in control of everything, as Anaxagoras did.

Plants are made up of the same substance as animals, the colder and more turbid they are, the further they diverge from the animal ^g. Growth is related to the seasons: cold things sprout in summer, hot things in winter.^h These generalizations were a prelude to practical husbandry. The best time for sowing is February, at the rising of the Pleiads, because rain will fall a week later. To leave sowing till the spring equinox is dangerous, because by then the earth is wet, heavy and steamy, and in texture like badly-woven wool.ⁱ Excess of water is the cause of various plant diseases, such as running to leaf in vines, and fungoid blight on figs and olives.^j

^a 3 ^b 4 ^c 5 ^d 1 ^e 13A17, 13A7 ^f 2 ^g 3 ^h 4 ⁱ 5 ^j 6

^{c1} This has been thought so unlikely that 'Metrodorus' has been emended to 'Zeno-dorus' by Horn (*Vors* II, p. 49, note)

63 IDAEUS

IDAEOUS of HIMERA date unknown. He is thought to have been a contemporary of Anaxagoras.

Idaeus is named by Sextus with Anaximenes, Diogenes and Archelaus, as one who said that Air was the elemental substance. It has been thought that he was the originator of the theory mentioned several times by Aristotle, that the substrate is something rarer than water and denser than air (or perhaps, denser than fire and rarer than air), from which things are created by rarefaction and condensation. The author of this theory was not known in antiquity some identified the intermediary substance with the Non-limited of Anaximander, but it was pointed out that Anaximander spoke of 'separating-out' only, not of rarefaction and condensation. Others ascribed the theory of an intermediary substance to Diogenes of Apollonia.^a

64 DIOGENES OF APOLLONIA

DIOGENES of APOLLONIA lived in the latter half of the fifth century

Diogenes' birthplace was probably Apollonia on the Black Sea, a colony of Miletus, not Apollonia in Crete, as some thought.^{b, b1} He is said to have been a pupil of Anaximenes, but this is impossible, as Diogenes lived much later he is called a contemporary of Anaxagoras,^c but it is clear from his writings that he was one of the last of those who pursued Ionian philosophy.^d Nothing else is known of his life.

Diogenes wrote a number of works. The longest surviving work was that *On Natural Science*, from which the quotations are derived; this work was known to Simplicius. He also wrote, and mentioned in his main work, other separate treatises, on Meteorology, and on the Nature of Man, and an attack on the Natural Scientists, whom he called sophists.^e

^a 64A4 ^b A3 ^c A1, A8 ^d A5 ^e A4

^{b1} See Burnet, EGP⁴, p. 352, note 3

¹ see Diels, *Vors.* II, p. 51, l. 4

His *magnum opus* began with a plain statement of what he considered to be the proper way to write such a treatise: the starting-point should be from some incontrovertible proposition, and the style should be simple and dignified.^a

His work was considered to be mainly eclectic, from Anaximenes, Anaxagoras, Leucippus and others,^b but his vision of Air as the explanation of all phenomena, organic and inorganic, and his clear, vigorous expression, give his views originality and a new force. His biological theories were based on careful anatomical study, especially of the veins and arteries.

He took as his substrate Air, giving as his reasons first, its importance to life. men and animals live by breathing, that is, by taking in air, and when it leaves them, they die.^c Air is therefore life and intelligence in men and animals, it is in everything, and there is nothing which has no share in it, though the share differs in every instance.^d Moreover, Air is most easily able to change its character: it can be hot or cold, wet or dry, more or less mobile, different in taste and colour.^e It is therefore the elementary form of matter from which all things are derived. There must be one elementary form, otherwise change and variety would be impossible,^f things cannot change one into the other, but as they have various forms, clearly there must be one substrate which adopts these differences. Aristotle commends this reasoning.^g Further, Air contains, or holds in its mixture, Intelligence, otherwise things would not be arranged according to measure: the balance of winter and summer, night and day, rain, wind and fine weather, show that all is designed for the best,^h and this is the work of Air, which guides and governsⁱ all things. In short, Air is God.^j

In inanimate creation, then, Air is the substrate, that from which everything is made, as Anaximenes said.^j (Diogenes cannot have been, as Nicolaus of Damascus said, the author of the theory that the element is an intermediary substance between Fire and Air.)^k It is boundless in extent and quantity, everlasting and imperishable. Its changes produce innumerable perishable worlds.^l Change is brought about by motion,

^a B1 ^b A5 ^c B4 ^d B5 ^e B5 ^f B2 ^g A7 ^h B3, A4, A8

ⁱ B5 ^j B5, A1, A4, A5, A6, A7 ^k A4, A5 ^l A6, A10

¹ κυβερναῖσθαι, a Heraclitean word (22B41, cp. Parmenides, 28B12, 1, 3)

which is due to the presence of Intelligence, the Life-force, in the mixture, motion produces changes of density, and whenever there is an accumulation of the Dense, an earth is formed, and all its accompaniments.^a

His cosmology was much like that of Anaxagoras. He said that the world is 'round', that is, apparently, a circular disc which settles out of the revolution in the centre of things, and is fixed there.^b It rests on air, and can be moved by it, the result being an earthquake.^c The sun, moon and stars, however, are not red-hot stones, as Anaxagoras had said, but are made of a pumice-like, that is, porous material, and the fire they appear to give out is really that of the outer Aether passing through them:^d he spoke of the stars as the breathing-holes of the universe.^e ^{e1} The moon, he thought, does not get its light from the sun, but like the sun, is a pumice-like body suffused with fire from outside.^f The sun is quenched by cold falling on the heat that is, apparently, eclipses are caused by the intervention of something between the sun and the aetherial rays.^g Nevertheless, in spite of this retrograde explanation of eclipses, he retained in his system the invisible dark bodies, or stones, postulated by Anaximenes^h and Anaxagoras:ⁱ these are the meteoric stones, which often fall on to the earth and are quenched, 'like the stony star which fell at Aegospotami'.^j Perhaps they are to be thought of as circulating between the sun's orbit and the outer aether. The sea is a relic of the original wet element: parts of it were evaporated by the sun, and from this arose 'breaths', currents of air which set the sun and moon in motion in a kind of choric dance.^k The process, as Anaximander said, is still going on, and one day all will be dry.^l The sea is salt because the sun draws up the 'sweet', that is, the fresh water, and the residue is salty.^m Thunder is caused by the collision of air with a cloud, if it is accompanied by lightning, then that which collides with the cloud is fire.ⁿ

He had an ingenious, though mistaken, theory concerning the flooding of the Nile in summer. He thought that it was a compensatory process, due to the heat of the Egyptian summer. The sun draws up moisture, but the earth cannot be allowed to

^a A6, A1 ^b A1 ^c A16a cp 59A89 ^d A12, A17, A14 ^e A12

^f A14 ^g A17 ^h 13A7 §5 ⁱ 59A42 §6, 59A77 ^j A12, cp 59A11

^k A17, cp ch 16 (Petron), p 84 above ^l A17, 12A27 ^m A17 ⁿ A16

^{e1} διασπαστός, more accurate than Anaximander's ἐκπνοή (12A21)

get too dry, and so it has 'perforations', which give it the power of suction, just as oil in a lamp flows to the burning part. Thus Egypt is enabled to attract to itself an increase of water in the Nile, to compensate for what is lost by evaporation. This law of compensation is also illustrated by the Black Sea, the waters of which always flow in one direction, into the lower sea, and are not subject, as other seas are, to alternating tides.^a

The creation of life is not described; but in all animals the life-force is the same. air, warmer than that outside us, but cooler than that near the sun. This temperature is not the same for any of the animals, nor even among individual men, but differs to an extent hardly noticeable, which however accounts for the many kinds of animals, and their differences of form, way of life, and intelligence.^b The opposite principle to Air is Fluid,^c which is the denser form of the element, and in animals means a lesser power of perception and understanding. This fluid the animals breathe in with the air from the ground, and they also eat wetter food.^d If it be asked why birds, which breathe purer air, have less intelligence than Man, the answer is that their bodies are so constituted that the breath, that is, air, does not pass right through them, but stays in the intestines. Hence they have rapid digestion but little thought.^e Fish appear to live on water, but this is because there is air in the water. Aristotle asks why do they die in air? Diogenes was reduced to postulating an excess of air.^f

Diogenes agreed with Anaxagoras and Archelaus that when earth and its animals were created the Cosmos automatically took on a slant, apparently because it was better for life that this should be so.^g

His book then proceeded to give detailed biological explanations, from which it is clear that his interests were largely medical. He discussed the nature of the semen, and described it as the 'foam' of the blood,^h that is, a manifestation of the presence of air, the life-principle, throughout the whole body, in the blood.ⁱ The father, not the mother, provides the offspring.^j The embryo is reared in the womb, being fed by means of cup-like vessels at the entrance to the womb (that is, not through the umbilical cord).^k He also apparently opposed

^a A18^b B5^c A19 §44, A18, A33, C1^d A19 §44^e A19 §44^f A31^g A11, 59A67, 60A4 §4^h B6, A24ⁱ B6^j A27^k A25^{c1} λευκός

the current medical opinion that the male is formed sooner, and moves earlier, than the female.^a The baby is born without breath, but warm. Contact with the cold outer air causes this air to be drawn into the lungs^b

The blood in the veins is everywhere accompanied by air. If the air is driven towards the chest and stomach, sleep ensues, if all the air leaves the blood-vessels, the result is death.^c The system of the blood-vessels is carefully described.^d

Air, being the life-principle, is responsible for sense-perception^e in all its forms. Like is recognized by like. Smell, drawn in through the nose, meets air of similar density round the brain, the nearer the approach to similarity between the outer air, the smell, and the air round the brain, the keener the sense of smell, he calls the similarity 'symmetry'. Hearing is caused by the stirring of the air in the ears by that outside, so that it penetrates to the brain. Seeing is caused by the reflection of things on the pupil, and this, mixed with outer air, gives the percept. Taste is due to the sponge-like texture (rare and soft) of the tongue, which draws up savours to the brain. The tongue is also the best judge of pleasure, and the best indication of sickness. He describes the kind of organs that give the keenest smell, hearing and sight. He has nothing to say about touch. Thus all perception is attributed to the inner air, which is reached by the outer air in different forms. Pleasure and pain also are attributed to the amount of air mixed with the blood, which makes it lighter and more mobile, or denser and more sluggish. Rarefied air in the veins makes for high spirits and health. Memory and emotion are attributed to the movements of air in the body. Thought is due to pure dry air, and lack of intelligence is due to the presence of fluid, which hinders the movement of the intelligent air.

The best means of diagnosing health in man is by means of the tongue, but in other animals, their state of health is best revealed by their colour,^f which shows the prevailing 'humour' of the body. Diogenes and his contemporaries were criticized by Galen and his school for neglecting other symptoms in the excess of importance they attributed to outward appearance.^g

Plants are generated on land when water putrefies and takes on an admixture of air.^h They themselves, not being hollow,

^a B9, cp A26

^b A28

^c A29

^d B6

^e A19, A21, A22

^f A19 §44

^g A29a

^h A32

are unable to take in air, and so have no intelligence.^a In this Diogenes diverged from Anaxagoras.^b

Thus Air is elementary matter, life, intelligence, and God, the soul of the universe. Diogenes is said to have praised Homer for believing that Zeus is Air.^c The passage in the *Clouds*^d which represents Socrates in his basket drawing intelligence from the pure upper air, away from the earth which drags towards itself the moisture of the mind, appears to satirize the views of Diogenes, and there is a passage in the comic poet Philemon which well expresses Diogenes' theory of the all-importance and ubiquity of Air.^e Diogenes' views had a great influence on the Hippocratic school. In Hippocrates' essay *On the Sacred Disease*, there is a passage which states that the brain is the ruling factor because it is the interpreter of what comes in from the air.^f The essay *On Breathing* contains a passage on the importance of air to life, which repeats the argument that water contains air because fish live in it,^g thus connecting the essay with Diogenes.

The power of the magnet is attributed to its ability to draw out 'fluid' from the iron.^h

65 CRATYLUS

CRATYLUS OF ATHENS lived in the latter half of the fifth century
B C

Cratylus was the younger contemporary of Socrates, and the associate and teacher of Plato.

He was a Heracleitean, and expounded the Heracleitean doctrine that all perceptible things are in process of change, so that knowledge of them is impossible, he appears to have been responsible for Plato's one-sided conception of Heracleitus' views.¹ He carried this doctrine to absurd lengths: since it was not possible to say anything true of anything, he gave up speech, and contented himself with moving his finger only.² He even considered gestures and inarticulate sounds, such as hisses, more suitable as a teaching medium than words, because the former are known symbols indicating what is not known.

^a A19 §44 ^b 59A117 ^c A8 ^d C1 (*Nub.* 225 sqq.) ^e C4
^f C3a ^g C2, A31 ^h A33 ¹ J ² 4

He criticized Heracleitus' saying that 'one cannot step twice into the same river'^a as not going far enough: one cannot step into the same river even once.^b He is represented in Plato's dialogue *Cratylus* as maintaining that it is impossible to say what is false, because one cannot utter 'what is not', and as holding the view that everything has by nature a name belonging to it, which is for Greek and barbarian the same, and not the name given to it by any one people.^c

66 ANTISTHENES THE HERACLEITEAN

ANTISTHENES of EPHEBUS: date not recorded.

Antisthenes is named by Diogenes Laertius as a follower of Heracleitus.^d 'Heracleiteans' are satirized by Plato in the *Theaetetus*,^e where they are said to favour the doctrine that perception and knowledge are the same, but to be unable to uphold it by rational arguments, preferring to imitate their master by shooting out oracular sayings and then retiring. In the literature of the Peripatetic school they are mentioned as believing that stones and earth come from fresh water dried and solidified, and that the sun is an 'exhalation' from the sea.^f

67 LEUCIPPUS

LEUCIPPUS, probably of ABDËRA, was in his prime about 430 B C

Leucippus is the most shadowy figure of early Greek philosophy. Nothing whatever is known of his life. His birthplace was variously given as Abdera, Elea, Melos or Miletus,^g according to the schools of thought with which he was connected, and he was said to have studied under Zeno or Melissus.^h Even in antiquity his existence was doubted sometimes;ⁱ but Aristotle often named him, with or without Democritus, and as Aristotle had special opportunities of knowing the truth about the philosophical school of Abdera, we can accept his

^a 22B91 ^b 4 ^c 5 ^d 1, 22A1 §15 ^e 3 (*Theaet* 179D sqq) ^f 2
^g A1 §30, A5, A8, A12, A33 ^h A1 §30, A4, A5, A10 ⁱ A2

view that Leucippus existed and that Democritus was his associate.^a From the accounts given by Aristotle, it seems clear that Leucippus was the inventor of the theory of Atoms, and that this was taken over and elaborated by Democritus, the popularity of whose writings caused them to oust those of his teacher.

Leucippus was credited with a book, called *The Great World-Order*, from which Democritus derived the terminology and basic doctrines of his own book. The two were sometimes confused.^b From another monograph, or perhaps a chapter of his *World-Order*, entitled *On Mind*, one quotation survives.^c His views were adopted by Diogenes of Apollonia,^d and by Epicurus,^e though the latter apparently was one of those who denied his existence.^{f, i1}

His name is usually coupled with that of Democritus, and is then usually (though not always)^g mentioned first. He is mentioned separately by Aristotle, Simplicius (drawing on Theophrastus), Aetius, Hippolytus and others. An Abderite school is mentioned by Simplicius and Aetius.^h

Leucippus was evidently, therefore, the originator of the atomic theory, which was intended to provide a final solution to the problems bequeathed by his predecessors on Being and Not-Being, Becoming and Passing-Away, Change, Motion, and the validity of sense-perception. It was designed in such a way as to solve the difficulties of the Milesians, to satisfy the propositions of the Eleatic school, and to incorporate what was valuable in the work of Empedocles and Anaxagoras.

The theory was as follows: there are two ultimate kinds of existence, which may be called the Full and the Empty, equivalent to Being and Not-Being.ⁱ The existence of Not-Being in this sense is therefore postulated, in opposition to the Eleatic school. It is literally that in which there is nothing. Moreover, Being is not One, but consists of an infinite number of bodies, of infinite shapes, and in constant motion, so small as to be invisible.^j These bodies are also so small that they cannot be divided, and are therefore given the name *atoma*, things which cannot be cut.^k The cause of their constant

^a A6 ^b B1 ^c B2 ^d A3 ^e A24 ^f A2 ^g A9, A19, A28 (Aristot.)

^h A20, A29 ⁱ A6, A7, A8, A10, A12 ^j A7, A8, A9, A10 ^k A13, A14

ⁱ¹ See Burnet EGP⁴, p. 330, note 2, Bailey, *The Greek Atomists and Epicurus*, p. 66

motion is not explained; it is merely stated that they move about of necessity in the infinite void, apparently at random and in all directions ^a

The atoms cannot themselves be affected, since they are incapable of division or alteration, that is, of penetration by the Empty, which divides things ^b They differ from one another only in shape.^c What the various shapes were is not specified: they were innumerable.^d It is said that the sphere was assigned to fire-atoms,^e but apparently further distinctions were left to Democritus to work out.^f Thus moving, they come into contact, and if suitable shapes collide, they become 'entangled' and form a moving mass. They can then be said to differ also in position and arrangement, relatively to one another ^g From these differences, and the amount of Emptiness included in the coagulation, all perceptible differences between things are derived. If one factor only is changed, such as arrangement, a different substance is obtained: witness the fact that a tragedy and a comedy are composed of the same letters of the alphabet.^h

As the atoms are in constant motion, there is constant change, coming-into-being and passing-away, as they unite and separate ⁱ Thus as the Empty Space is infinite, and also the number of atoms, there are innumerable universes, formed by their concurrence.^j Such a formation is a matter of chance: the Cosmos is not alive, nor governed by foresight or design, but is put together through the coagulation of atoms driven by some non-intelligent natural cause ^k It follows that truth is an appearance only, what we think we see is change, difference, oppositeness, what actually takes place is an alteration, not of substance, but of combination and arrangement of atoms and space ^l

The creation of a Cosmos takes place in the following way. *many atoms of differing shapes separate off from the infinite mass and come together in a great empty space. Here, having collected, they form an eddy, that is, they begin to move round in a circle. As they jostle together in this revolution, like goes to like. the light atoms fly outwards, the rest stay together. Of the latter, certain hook-shaped atoms, being interlocked, form a kind of outer skin, globe-shaped, enclosing the rest;*

^a A6, A15, A16, A18, A19 ^b A14, A7 ^c A6, A8 ^d A8, A14, A15
^e A15 ^f A11 ^g A6, A7, A9, A14, A15, A1 §30 ^h A9 ⁱ A10
^j A20, A21 ^k A22, A10, A1 §31, cp. B2 ^l A9

this is the sky. In the centre are the bodies borne there, and now cleaving together, except for some which fly outward and are retained by the outer skin, which keeps whatever touches it; these are the heavenly bodies. All is now revolving round the central mass, which is the material from which earth is made. The motion caused the drying up of this mass, and the squeezing out of the water, so that earth and sea were separated.^a

The rest of Leucippus' cosmology is incompletely preserved. He thought that the sun's orbit is outermost, that of the moon nearest the earth, and those of the other stars between these.^b The earth, in the centre, is shaped like a flat drum or tambourine,^c and itself revolves. The account of the heavenly bodies in Diogenes Laertius is confused: the stars, he says, are conglomerations of atoms flung off from the central earth-and-water mass, these are dried and made fiery by the swiftness of their motion.^d It is hard to reconcile this with the atomic theory, which assigns a definite shape to fire-atoms. Still more difficult is the statement that the sun is set on fire 'by the stars',^e that the moon has 'little share of fire' is more consistent.^f The sun is seldom eclipsed, and the moon oftener, because of the different sizes of their orbits.^g The apparent obliquity of the sun's orbit is due to the tilting of the earth at one end: in the north, the air is colder and denser, and therefore better able to support the earth, in the south, where the air is finer, the edge of the tambourine sinks down.^h Thunder is caused by the bursting out of fire caught in a thick cloud.ⁱ

Sense-perception is a physical affair, due to emanations from objects.^j Vision, like the reflections in mirrors, is due to the reception of the emanation by a subject capable of retaining it: in the case of vision, by the pupil of the eye.^k Small changes of colour are due to the addition of atoms invisible through smallness.^l Thus sense-perception as we know it is unreal, a matter of opinion, 'by convention', not reality, since nothing is real except the atoms and emptiness.^m Change is as much a matter of imagination as the bent appearance of an oar under water.ⁿ

The life-principle is fire, that is, a collection of spherical

^a A1 §§30-31, A10, A24

^b A1 §31

^c A1 §30, A26, cp 59A88

^d A1 §§32-33

^e A1 §31

^f A1 §31, A27

^g A25

^h A30

ⁱ A29, A31

^j A29

^k A32

^l A33

atoms, chosen because of their powers of penetration, and of moving others while themselves in motion. This process is assisted by breathing: moving particles are drawn in from outside, and they also prevent what is coagulated in the animal from dispersing.^a Sleep and death are physical, being due to the partial or excessive separating-off of the finer particles.^b He discussed certain biological phenomena such as procreation and sex-determination, but not in any detail.^c

The only actual words of Leucippus that survive are taken from the chapter *On Mind*. 'Nothing happens at random, all happens out of reason or by necessity.'^d No such guiding purpose can be discerned in the scheme attributed to him, and in fact it seemed to the ancients that he assigned everything to chance.^e He may have believed that the infinite movements of the atoms and their chance coagulation were themselves due to the ultimate Mind, or else this remark, as well as the chapter or treatise *On Mind*, may be wrongly attributed to him instead of to some follower of Anaxagoras. So far as our authorities go, there was no place whatever for Mind in Leucippus' scheme, in fact, there was a strenuous effort to eliminate all but atoms, space and motion.^f

68 DEMOCRITUS

DEMOCRITUS OF ABDERA WAS IN HIS PRIME ABOUT 420 B.C.

Democritus is said to have written in his book, called the *Lesser World-Order*, that he was forty years younger than Anaxagoras, his prime of life is therefore placed at 420 B.C., and the date of his birth given as 460 B.C.¹ Others placed his birth earlier, either in the same year as, or a year before, that of Socrates (470-69),² others earlier still, in 500 or 494 B.C.,³ and were obliged to extend his life to ninety or a hundred years, or even more,⁴ so that he could be made to live through or

^a A28 ^b A34 ^c A35, A36 ^d B2 ^e A22, A10 ^f A1 §41, B5

¹ A1 §41, A2 ² A4, A5

³ A5 (Diodorus), 90 years, A4, A1 §39, 100 years, A6, 104 years, A1 §41, 109 years

⁴ Cp Burnet, EGP⁴, p. 340. Accepting the frg. (B2) as genuine, he thinks that Leucippus did not assign creation to Chance, but was mistakenly supposed to have done so because he left motion unexplained.

beyond the fifth century. The dates given for his death range from 404 B.C. to 359^a

He was a native of Abdera in Thrace, this is generally agreed, though once Miletus^b is given as his birthplace, this belongs to the tradition that placed his birth in 494 B.C., the date of the fall of Miletus, and can, like the date, be dismissed. Of his childhood, it is stated that he received instruction from certain Chaldean Magi,^c these had been left behind in Democritus' father's house by Xerxes, when he stayed at Abdera on his retreat from Greece in 480 B.C. That Xerxes stayed at Abdera is corroborated by Herodotus,^d but whether the Persian overseers left behind were Magi, and stayed long enough to instruct Democritus, remains doubtful. (The tradition is one of the reasons why some chronologists have placed his birth so early in the century) The probability is that as the Persians under Xerxes used Abdera as a halting-place on their line of retreat, the town had retained Persian connections; and that Democritus as a child heard tales of Babylonian learning.

When he was old enough he took his share of his father's property in money, and set off on his travels, leaving his two elder brothers to manage the estate,^e he travelled to Babylon to learn from the Chaldean Magi, to Egypt to learn from the priests, and, according to some, to India to learn from the Naked Sages, and to Aethiopia, he also visited Athens, but did not make himself known to anyone.^f

That he travelled widely need not be doubted, but the story of the division of the patrimony appears to be based on some remarks of his in a treatise on Economics, on the desirability of dividing one's estate among one's children as soon as possible.^g The extent of his travels cannot be determined, but the strong tradition that he was one of the most widely-travelled of the philosophers, which is at the back of all the accumulated details, can be accepted. It led in later times to the fathering on Democritus of a quantity of magic literature, embodying the occult lore that he was supposed to have acquired in Egypt and Chaldaea. That he visited Athens is supported by a sentence from his own writings: 'I came to Athens, but no one knew me.'^h Demetrius of Magnesia, who

^a A5, A4^b A1 §34^c A1 §34, A2^d VIII, 120, VII, 109^e A1 §35, A16^f A1 §35, A2, A12, A13, A16, A40, B116, B299^g B279^h A1 §36, B116

quotes the sentence, says that Democritus' reason for remaining unknown was a contempt for fame, and that he knew Socrates, but Socrates did not know him. If this is true, Democritus' visit to Athens took place in later life, when he was famous, and not during his youthful travels. Demetrius of Phalerum, however, in his *Defence of Socrates*, said that Democritus never visited Athens;^a this was apparently in order to defend Socrates against some charge of having treated Democritus coldly. There was a story current that Democritus was hostile to Anaxagoras because Anaxagoras did not 'receive' him or admit him into his society,^b this story may have been applied to Socrates also. It seems best to assume that Democritus did visit Athens, but that Demetrius, though an Athenian, could find no one who knew of his passage. That Democritus lived in Athens for a long time^c is most unlikely. The stories of his hostility to Anaxagoras are no doubt invented to account for his criticism of Anaxagoras' views.

Clement of Alexandria, commenting on Democritus' travels in the East and Egypt, quotes a sentence in which Democritus declares that he has travelled more widely than any other man of his time, has seen the most climes and countries, and has heard the greatest number of learned men; that no one has surpassed him in the composition of treatises with proofs, not even the geometers of Egypt, with whom he spent five years.^{d, d1} This is coupled with the assertion that Democritus not only learnt from the Magi and priests, but also wrote under his own name a book of Babylonian ethics which he had copied from the Pillar of Akikaros.¹ On linguistic and other grounds this fragment is now generally regarded as spurious, belonging to the mass of forged literature which was later issued under Democritus' name because of his legendary reputation as one steeped in the lore of Babylon and Egypt.²

On his return he was obliged to live poorly. There was a

^a A1 §17

^b A1 §35

^c A11

^d B299

^{d1} *Arpedonaptae*, 'rope-fasteners', applied to Egyptian geometers

¹ Akikaros, a Chaldean sage, whose sayings began to reach Greece during the fourth century B.C. and after. Theophrastus wrote a dialogue 'Ακικαρος (Diog. L V 50). The sage is mentioned in the Book of Tobit, ch. 1, 22, as prime minister to King Esarhaddon (Sarchedonus) at Nineveh, and nephew to Tobit. Strabo gives him in a list of seers as 'Ακικαρος, interpreter to the inhabitants of the kingdom of Bosphorus. An Aramaic version of his sayings was found in fragmentary form in papyrus discovered at Elephantine in 1912.

² See below, pp. 123-599, where the whole question of the forged writings is discussed.

legend that he was liable to some form of penalty for having spent his patrimony, but that either he or his relatives read aloud his work on the World-Order to his accusers or judges, and they assessed it at as high a value as or higher than the huge sum he was said to have spent.^a

Of the rest of his life, nothing is known, not even where he met Leucippus. Among those who studied under him are mentioned Hippocrates (though some said that Democritus' pupil was Metrodorus of Chios, who taught Hippocrates),^b and Protagoras, whom he rescued from menial work, and made first his secretary and then his pupil.^{c, c1} A similar story is told of his ransoming Diagoras of Melos from the slavery into which he had been sold in 411 B C on the capture of Melos by Alcibiades, and likewise making him his pupil.^d

He spent his life, therefore, teaching and writing, and had no other history. It was sometimes said that he held office at Abdera,^e as the Pythagoreans had done at Croton, but the main tradition makes him rather a philosopher of the type of Anaxagoras, one who gave up all affairs, public and private, for research.^f He did, however, write a shrewd and detailed work on politics, but he is also quoted as saying that it is shameful to pursue public affairs to the detriment of one's own business.^g Other anecdotes illustrate the value of the scientist to the State, for example, how Democritus saved the people of Abdera from famine,^h or saved the harvest for them by forecasting a violent rainstorm.ⁱ A story similar to that attached to Thales^j attributed to Democritus a corner in olive-oil.^k It is said that his investigations into the nature of apparitions led him to spend time among the tombs.^l His attitude towards his fellows later caused the epithet *Gelasinos* ('Laughter') to be attached to him, as one who laughed at the folly of human beings in their pursuit of foolish desires.^m

There was a confused tradition that he deliberately blinded himself by gazing at the sun's reflection, because sight impedes the action of the mind,ⁿ Plutarch rightly dismissed this foolish story,^o which is quite out of keeping with Democritus' work. The stories of his death are contradictory: Lucretius furthered

^a A1 §§39, 40, §36, B 0c ^b A1 §42, A2, A10 ^c A9 ^d A10a ^e A2
^f A1 §36, A15, A169 ^g B80 ^h A19 ⁱ A18 ^j 11A10 ^k A17
^l A1 §38 ^m A2, A21, A40 ⁿ A22, A23, A25, cp A26 (the Christian version)
^o A27

^{c1} This story must be rejected on chronological grounds, see below, pp 343-4

a tradition that he committed suicide when he felt his mental powers failing;^a but other anecdotes say that he tried to prolong his life, and give the recipe (smelling hot bread, smelling honey).^b These stories are a projection of his investigation into the nature of qualities such as hot-cold, sweet-bitter,^c and of sense-perception, and need not be believed.

Writings A large body of written work was produced at Abdera, during and after Democritus' time, it was realized in antiquity that not all the works bearing Democritus' name were by him. These writings were examined and arranged by the Alexandrian scholars, and the dialect was studied. Callimachus prepared a *Table of Democritean Vocabulary and Syntax*, and Hegesianax wrote a book on his style.^d The work of the Alexandrians was later used by the Romans. Thrasyllus in the time of Tiberius prepared an arrangement of the works of Democritus and his school in tetralogies,^e according to subject-matter: Ethics (Tetralogies I and II), Natural Science (III to VI), Mathematics (VII to IX), Music (X and XI), and Technical Works (XII and XIII), besides these, there was a list of works under the title *Causes*, and also a list of works given separately by some among Democritus' treatises.

The works on Ethics included a treatise On Pythagoras, and On the Philosophical Nature, as well as on Courage and Imperturbability, and On the Next World. Natural Science embraced Cosmology and Astronomy, Psychology and Sense-Perception, Logic, Problems, and Criticisms (of past theories). Mathematics included Geometry and Numbers, as well as certain geographical and astronomical calculations. Music included Rhythm and Harmony, Poetry and Phraseology; there was a treatise on Homeric Diction. The technical works dealt with Medicine, Agriculture, Drawing and Painting, and even Military Tactics. The treatises grouped under the heading *Causes* investigated the causes of various phenomena, celestial and meteorological, botanical, biological and geological, fire, sound, and many other things. Among the treatises which Thrasyllus says are given separately by some is grouped a number referring to the lore of Egypt and Babylon, these are nowadays regarded as suspect. Thrasyllus adds that all other titles ascribed to Democritus are either compilations

^a A24, cp A6^b A28, A29, A1 §42^c A17a^d A32^e A33

from his works, or are admittedly spurious,^a thus showing that a considerable body of doubtful works existed. There were some who believed that the only works actually by Democritus were his book or books on the System of the Universe — the *World-Order* — and certain letters^b

The book called *World-Order* (*Diakosmos*) is given by Thrasyllus under Tetralogy III, as two works, one called the 'Great World-Order', the other the 'Small'. Thrasyllus adds that the school of Theophrastus believes the *Great World-Order* to be the work of Leucippus, while the *Small World-Order* is the work of Democritus, based upon Leucippus' work. This is generally accepted.^c

Commentaries on Democritus' books were numerous. The Peripatetic school devoted particular attention to him, Aristotle wrote a work *On Democritus*, and *Problems from Democritus* in two books, Theophrastus wrote *On Democritus*, and *On the Astronomy of Democritus*.^d Plato never referred to him; this gave rise to a story that Plato wished to burn all the books of Democritus that he could collect, but was restrained by Amyclas and Cleinias the Pythagoreans.^e Other works were written in criticism of Democritus' views, by another of Aristotle's pupils, Heracleides of Pontus, by Epicurus and his pupil Metrodorus, and by the Stoics Cleanthes and Sphaerus.^f The criticism of Democritus by Epicurus^g is particularly astonishing since he owed his entire scientific system, and much of his ethics, to Democritus. But the claim to complete originality was one of Epicurus' obsessions, a much truer estimate was that of Hermippus, who said that the discovery of Democritus' writings changed Epicurus from a school-master into a devotee of philosophy.^h

Democritus was able to clothe his scientific material in a literary style. Cicero says that his style had rhythm, like that of Plato, and that he was more poetical than the comic poets. Though, like Heracleitus, he had a gift for epigram, unlike Heracleitus he was never obscure. Dionysius of Halicarnassus also ranks Democritus with Plato and Aristotle as belonging to the 'middle style'.ⁱ

Of his works, over three hundred quotations or alleged quotations have survived. Of these, a few can be assigned to

^a A33 (end)^b A31^c B4b, B5, cp A2^d A34^e A1 §39^f A34^g Diog. L. X 8^h A52ⁱ A34

the books given as Democritean by Thrasyllus; but the majority come from unspecified works. There is also a large collection of (*Gnômae*, pithy phrases mostly of a practical ethical turn, ascribed to 'Democrates', but usually believed to be by Democritus. Finally, there are the fragments which purport to come from works by Democritus revealing the magic lore of the East or of Egypt.

Fragments which can be assigned to titles given in the tetralogical system of Thrasyllus—It must be remembered that the writings listed by Thrasyllus are probably those of the complete body of writings of the Democritean school which Callimachus found in existence; they are therefore genuine only in the sense that they belong to the genuine Abderite writings of the fifth and fourth centuries, as opposed to Alexandrian and later forgeries. They are therefore not necessarily by Democritus himself. Even the titles of the works from which quotations are made often vary.

From the First Tetralogy (*On Pythagoras*, *On the Philosophic Character*, *On the Next World*, *On Tritogeny* or the threefold nature of all human things) only a few actual words survive,^a and the meaning even of these is uncertain. Some said that the book *On the Next World* was one of the two which he read to the jury on his trial for spending his patrimony,^b but others mention only the *World-Order*. His book *On Pythagoras* is thought to have been appreciative, as he was said to have been a great admirer of Pythagoras, and to have 'taken everything' from him, and even, by some who ignored chronology, to have been his pupil.^c The book *On the Next World* seems, judging by the references to it in Proclus and Philodemus, to have been concerned with death rather than Hades. Proclus says that the book discussed the problem of those who appear to be dead and come to life again,^d Philodemus that Democritus, writing on death, discussed the physical phenomenon of corruption, and drew a moral therefrom that beauty and strength must be reduced to the same material elements as all other flesh, and that it is foolish to be grieved at the thought of a poor tomb, or to attempt to evade the thought of one's death by such devices as postponing making a will.^e The (*Tritogeneia*) dwelt on the favourite theme of the number Three: the epithet *Tritogeneia*, applied to Athene, was interpreted to

^a B 1a^b B 0c^c A 1 § 38^d B 1^e B 1a

mean 'threefold creator', because from wisdom arise three things: sound thought, sound speech, and right action.^a

From the Second Tetralogy there are more remains. The books *On Courage* and *On the Horn of Amalthea* remain mere titles; but the book *On Contentment of Spirit* (*Euthymia*) was one of the most quoted, though the title is not given. There was also perhaps a book on *Well-Being* (*Euestô*) which was lost; or this may have been an alternative title to that *On Contentment*. A work called *Ethical Notes* is also mentioned. Many of the ethical quotations from unspecified books, and perhaps some of the apophthegms, came from these works.^b

The next four tetralogies contain the works on Natural Science, that is, the bulk of the Democritean theories of World-Order, and the nature of man. In the Third Tetralogy, the first work listed is the *Great World-Order*, generally believed to be the work of Leucippus, the second work was the *Small World-Order*, believed to be Democritus' own work based on that of Leucippus. No actual words from the latter survive, though the phrase stigmatized as bombastic by Sextus, 'the following things I declare concerning the Whole',^c has been thought to be its beginning. It was in this book that Democritus gave his own age as forty years younger than Anaxagoras, and the date at which he wrote the book as 730 years after the fall of Troy.¹ It contained an attack on the views of Anaxagoras, whom he accused of not being original, but expressing opinions derived from ancient sources.^d Many extant summaries and some quotations probably coming from this work, though the title is not mentioned, survive, and it is believed that the contents can be gathered even more fully from summaries and commentaries based on the work of Hecataeus of Abdera, who in the time of Alexander wrote a full account of Democritus' teachings. The chief passages thought to be derived from Hecataeus are those in Diodorus^e and Diogenes Laertius, in the Byzantine Tzetzes' notes on Hesiod,^f and possibly in the Christian writer Joannes Ktatrios' dialogue *Hermippus*.^g From these one may gather that the work described the change from chaos to cosmos, the creation of our universe, the generation of animals and lastly

^a B2 ^b B2a-B4a ^c B165 ^d B5 ^e B5, 1 ^f B5, 7 ^g B5, 2

¹ The era he used is not known. Burnet, EGP⁴, p. 331, note 1 (where there is a misprint, 750 for 730)

man, the growth of human society from the primitive life of early man, the discovery of fire and the arts. With these may be compared the theories of Lucretius, as well as those of his master Epicurus. The other books of the Third Tetralogy, *On Cosmography*, and *On the Planets*, obviously either belong to, or amplify, the *World-Order*.^a

The Fourth Tetralogy listed two books *On Nature*: the first *On the Nature of the Universe*, the second *On the Nature of Man*, these too appear to be either parts of, or amplifications of, the *World-Order*. The third work, *On Mind*, and the fourth, *On Perception*, were sometimes grouped together as one psychological work.^b

The Fifth Tetralogy contained separate treatises on *Tastes*, *Colours* and *Forms*,^c and it was in the last-named work that Democritus stated his theory of knowledge.^d

In the Sixth Tetralogy were grouped the works *On Apparitions*, *On Logic*, *On Proofs* (or *Supporting Arguments*) and *On Difficult Questions*. These dealt with the problem of knowledge and its relation to perception, and on the method of scientific thought.^e

The Seventh Tetralogy contained mathematical works: a treatise on different methods of conceiving geometry, with special reference to the circle and the sphere, others *On Geometry* itself, and special geometrical problems; and one *On Numbers*. No specific quotations remain.

The Eighth Tetralogy contained a work in two books on *Disproportionate Lines and Solids*, a treatise *On Projections*, that is, methods of representing a sphere on a plane surface, an astronomical Calendar, called *The Great Year*, or *Astronomy*, and a work of uncertain title, *Contest by* (?) *Water-clock*, possibly dealing with methods of measuring time.^f Theophrastus wrote a treatise *On the 'Astronomy' of Democritus*, and Democritus' Calendar was used by subsequent compilers of calendars, such as Eudoxus in the later fourth century, Geminus¹ (or the author of the astronomical treatise of the first century B.C. which bears his name), the astronomer and geographer Claudius Ptolemaeus of Alexandria in the second century A.D., and the Byzantine Joannes Lydus in the sixth century A.D.^g

^a B5a, B5b^b B5c-B5f^c B5g-B5i^d B6-B8a^e B8b-B11a^f B11p-B14a^g B14¹ Writer of a Calendar used by Proclus. Date uncertain, perhaps first century B.C.

The Ninth Tetralogy contained four descriptive works, doubtless with charts and diagrams, *On the Heavens*, *On the Earth*, *On the Pole*, and *On Light-Rays*. It is said that Democritus was one of the many who wrote a *Voyage Round the World*, but that he made the world rectangular instead of round.^a No specific quotation from these works survives.

The Tenth Tetralogy contained works *On Rhythm and Harmony*, *On Poetry*, *On the Beauty of Words*, and *On Euphoni-ous and Discordant Letters*^b

The Eleventh Tetralogy contained works *On Homer*, *On Correctness of Diction*, *On Song*, and a Vocabulary. Few direct quotations survive, though Democritus' views on literature, diction and nomenclature were often referred to.^c

The Twelfth Tetralogy deals with medicine: there are works *On Prognosis*, *On Diet*, *On Medical Method*, and *Causes of Seasonable and Unseasonable Things*.^d No direct quotation survives. The work of Hippocrates *On Diet*, far from acknowledging any debt to Democritus, says that previous treatises on this subject are inadequate, and that his own work is written expressly to fill a want.^e Certain manuscripts purporting to be the *Prognostic* of Democritus survive, but are thought to be based on a Hippocratic forgery.^f

The Thirteenth Tetralogy gives a work *On Agriculture*, which was known to Varro and Columella, a work *On Painting*, and two treatises *On Military Tactics* and *Fighting with Arms*. The two military works are thought to be by a different Democritus, a historian who according to Suidas wrote two books on *Tactics*, as well as a work *On the Jews*.^g

Not included in the Tetralogies, but grouped under the title of *Causes* were nine works dealing with the causes of particular phenomena in the heavens, in the air, and on the earth; fire, sounds, seeds, plants and fruits, animals (in three books); the magnet, and various other phenomena. Finally there was a group of works separately listed by some as belonging to Democritus' memoranda: *On the Sacred Writings of Babylon*; *On the Sacred Writings of Meroë* (in Aethiopia); *Circumnavigation of Ocean*, *On Research*, *Chaldean Theory*, *Phrygian Theory*; *On Fever and Coughing*, *Legal Causes*, and *Problems*. Their genuineness is suspect because they were listed separately, and

^a B14b-B15b^b B15c-B20^c B15c^d B26b-B26e^e B26c^f B26b^g B28-B28c

what is known of their contents increases the suspicion. This question will be discussed later.^a

The set of (~~Maxims~~ *Gnômae*)^b attributed to Democritus is given in a collection called *Maxims of Democrates*. Stobaeus in compiling his anthology quotes Maxims of Democritus, many of which are the same as those of the 'Democrates' collection; it is therefore believed that 'Democrates' is a corruption or a later attribution, due to the discovery by Byzantine scholars of the existence of one Democrates of Aphidna in Attica, who wrote on agriculture in the fourth century B C

Metaphysic. The principal authorities for Democritus' metaphysical and cosmological opinions are Aristotle and his school; it has often been pointed out that as Aristotle's native town Stageira was not far distant from Abdera, he had a good opportunity of learning Abderite views. Aristotle singled out Democritus for special commendation, as having gone deeper than others, including Plato, in discussing such problems as change, and as having not only grappled with all problems, but touched on a new scientific method, dependent on the concept of the Formal Cause.^c He was also (says Plutarch) willing, like Aristotle himself, to renounce without fuss or irritation views formerly held and found to be mistaken.^d

In his book *On Democritus*, Aristotle gave a detailed account of his metaphysical system, extracts from the book are given by Simplicius. Democritus, like Leucippus, believed that all phenomena could be explained by combinations of atoms and space. The atoms are infinite in number, and so small as to be imperceptible by us; space is of infinite extent. The atoms are Substance, Fullness, Being, space is Emptiness, Nothingness, the Unbounded. Though the atoms are so small, they are nevertheless of different sizes and shapes, they can also differ in arrangement and position relative to each other.^e

Democritus, by saying that the atoms were 'infinite in size and number',^f appears to have misled some into thinking that he meant that some of them were very large; it was sometimes said that Democritus differed from Epicurus on this point,

^a Below, pp 323-399

^b B35-B115

^c A35, A36

^d A35a

^e A37 (Simpl quoting Aristotle *On Democritus*), A38, A40, A43, A44, A45, A46

^f A1 §44

namely that while Epicurus thought that all the atoms were so small as to be imperceptible, Democritus thought that there were also some very large atoms,^a and even that it was possible to have an atom as big as a universe.^b It seems more likely that Democritus, while stating this as a logical possibility, believed in the imperceptibility of the atoms, and that 'infinite in size' means 'infinitely small', since the summary of Simplicius is explicit on this point,^c and the authority for stating that he said that there actually were very large atoms is late ^{d, d1}. Even if Democritus said that there were an infinite number of sizes, that is, that no two atoms were the same size, they could still all be imperceptibly small.

Their shapes also were infinite in number no two were alike.^e He gave a few examples rough and smooth, angular and curved, and so on.^f These are the only differences between them size and shape.^g No one atom can come from another^h (one cannot come from two, nor two from one),ⁱ they are, by hypothesis, the result of a division carried to the last possible stage.^j They cannot in themselves be affected or changed, they do not get 'hot or cold', or 'wet or dry', still less change from black to white, or undergo any of the changes experienced by sense-perception.^k They possess, however, the power of motion, and this brings the second element, empty space, into play, both as that in which the atoms move, and as entering into the composition of bodies.

The atoms move in empty space, and thus they can be said to differ in two further respects, which Democritus called 'aspect' and 'contact', and Aristotle translated as 'position' and 'arrangement'.^l These differences are not, like shape and size, intrinsic, but are brought about by their relation to one another. The original cause and nature of their motion is not explained, it is a kind of strife,^{m, m1} a being carried along at random,ⁿ and it had no beginning, but existed by immutable law from eternity.^o It was sometimes alleged that Democritus said that the atoms had no power of motion, but are moved 'by a blow'.^p But it is obvious that there could have been no

^a A41 ^b A47 ^c A37 ^d A41 ^e A38, A37 ^f A80, A37 ^g A47

^h A41 ⁱ A42 ^j A48, A48a, A48b ^k A49 ^l 67A6, 68A38, A125

^m A37 ⁿ A43 ^o A56, A39, A66 ^p A47

^{d1} Dionysius, Bishop of Alexandria (third century A.D.) quoted by Eusebius Cp Bailey, *The Greek Atomists and Epicurus*, p. 126

^{m1} *σπασίδειν* suggests *σπείρειν*, 'intestinal strife'

collisions among the atoms unless they were originally in motion. This contradiction is bound up with the contradictory statements regarding his theories on weight.

Aristotle says that Democritus did attribute weight to the atoms, and that this was the cause of their motion, their weight differed according to their size ^a Others expressly state that Democritus said that the atoms have no weight, but 'move through collision' in infinite space, and that whereas Democritus gave the atoms only two intrinsic differences, size and shape, it was Epicurus who added the third, weight ^b The reason why the argument arose, and why it was felt necessary by someone to add weight to the primary bodies, is clear: it was in order to explain the cause of motion, left unexplained by the original author of the scheme. In Epicurus' system, the motion of the atoms became 'up and down', owing to the introduction of weight, and the notorious 'swerve' had to be arbitrarily introduced in order to bring the atoms together ^c It seems likely, in view of these conflicting statements, that Aristotle was using 'Democritus' here to mean the Democritean school, and that the introduction of weight was due to a later development. At any rate, even if Democritus at any time came to think that the atoms had 'weight', he cannot have meant by this what the school of Epicurus meant, namely that they moved 'up and down' in the void, for he obviously describes them as moving in all directions at random, and as being 'scattered about'.^d By 'weight' he must have meant 'force of impact', that is, the bigger the atom, the heavier the blow it could give when colliding with another ^e But the original cause of its motion leading up to the impact remains unexplained, and merely fixed by necessity ^f There is a suggestion that Democritus thought that 'weight' in the sense of rising and falling was an appearance only: that he was thinking, not of any 'up and down' in the void itself, but of the tendency by which bulkier particles seek the centre of a vortex, while the less bulky are extruded and 'appear to rise'.^g This is quite different from the Epicurean 'up and down' in parallel lines, which necessitated the swerve, though Epicurus is said to have adopted Democritus' views on weight also,^h but Epicurus by his own tenets had no need to accept any one out of several

^a A58, A60^b A47^c A51, A50^d B168, A57, A58^e A47^f A39^g A61^h A61

scientific explanations,^a even when they were mutually exclusive; and the probability is that the idea of the swerve was not his own either, but was borrowed from the later Democritean school.

The atoms, moving in space, collide, and the variety of their shapes causes them to cleave together, or 'become entangled'.^b Every such conglomeration is different from every other, because of the differences in the atoms composing them.^c A conglomeration persists until or unless some stronger impact scatters it.^d Thus is caused all change, coming into being, passing away, growth and decay: the atoms do not change, and have no power to 'act' or 'experience'; they merely collide, combine, mingle and separate.^e Change of substance is merely change of place, as Aristotle puts it.^f

Once the atoms have collided, an eddy or vortex is set up.^g This brings into play the principle 'Like seeks Like', to which Democritus seems to have given new importance, and which he seems to have illustrated with new examples, such as the gregariousness of birds, the sorting of similar grains in a sieve, and similar stones on the sea-shore.^h He went so far as to say — and in this he was unique — that only likes can affect or be affected by one another, and if unlikes appear to do so, it is in so far as they are like.ⁱ The whirling conglomeration thus becomes a cosmos or ordered world, by the separation of its components into groups of similars. This was the manner of the creation of our world, and of innumerable others which arose in infinite space.^j

There are an infinite number of worlds; and all differ from one another, in size and other respects. Some have no sun or moon, others have them, but larger than ours, or more numerous. Their spacing in the void is also different: in some parts there are more worlds, in others less. Some are growing, some are at their prime, others perishing, some are being created, some being dissolved. Some are without animals, plants or any moisture. A world has reached its prime when it can no longer take in anything from outside; and its final destruction comes about by collision.^k The worlds are, of course, the same in essential composition, being formed out of the same elements,

^a *Ep. ad Pyth.* 94^e A₅₈, A₅₇, A₆₄^b A₃₇, A₄₁, A₄₉, A₅₇^f A₅₈^j A₆₃^j A₄₁^c A₃₈^d A₃₇^g B₁₆₇, A₆₇, A₈₃^h B₁₆₄, A₃₈^k A₄₀

atoms and space,^a but they cannot be the same in all particulars (as Cicero mistakenly said).^b They differ because the numbers, sizes and shapes of atoms composing them are not and never can be the same.

It follows then that there are two grades of existence, or reality. One, consisting of the atoms and space, is imperceptible; the atoms have no quality except size and shape, and are too small to be perceived, the other, comprising all the experiences of our sense-perception, colour, smell, sound, temperature and so on, is brought about only by the combination of atoms and space, and is therefore less fundamentally real than the elements. Colour, taste and the rest are so called 'by custom', only atoms and void exist 'in reality'.^c There is no such thing as absolute change of one thing into another, there are certain appearances assumed by atoms and space in combination, and called by us 'man', 'plant', 'fire', 'water', and so forth.^d

The question whether Democritus' metaphysic assigned everything to chance was much debated, it was generally agreed that though he appeared to make chance supreme, this was not really true. There appear to be three stages in his creation: the first, fixed by necessity or unchanging law, is the immutable nature of the elements, atoms and space, and the 'natural compulsion' which makes the atoms move in space,^e this is the very essence of things, their 'nature' or potentiality, which is fundamental.^f Democritus was criticized for giving no further explanation, but simply stating that this was so,^g he himself, however, believed that the fundamental nature of atoms and space neither needed to be nor could be explained. The second stage was the collision of atoms, and consequent coagulation, this, the original formation of each cosmos, seems to be assigned to chance,^h but it was a 'chance' arising out of the essential nature of things.ⁱ Finally, in explaining the details of the cosmos, he returned to the laws of cause and effect, and design.^j

In an effort to make his meaning clear, Democritus used new terms. The atoms were the Full or Solid, as opposed to Space, the Empty,^k he invented the term *Den*, from *Méden*

^a A82 ^b A81

^f A39, A66, B168

^g A65

^j A68

^c A49, A1 §45

^h A68

^k A44, A45, A46

^d A57

ⁱ A70, A69, A67, cp B176

^e A1 §45

('Aught' and 'Naught') to express substance, and said that 'The Aught had no more reality than the Naught', that is, Space is as real as Substance.^a It seems possible that he called the atoms 'Ideas', that is, 'particular forms'.^b

Cosmology and Meteorology. The principle of the 'Vortex', which causes like to join like, applies to our universe. The fire-atoms fly to the outside;^c they are round and smooth,^d and very small,^e so that they are able to move most easily; the larger atoms seek the centre. The earth was created before the heavenly bodies. Then came the moon, then the sun, then the fixed stars. The different planets have different heights,^f that is, distances from the centre of their cosmos. The sun and moon broke off from the central conglomeration, and were at first earthy in substance, lacking heat or brightness, the sun-disc increased in size, and 'took fire to itself',^g presumably from the outer ring of fire-atoms. It is, in fact, as Anaxagoras said, a molten mass or fiery stone.^h The moon, likewise of earthy substance, takes its light from the sun,ⁱ the earthy nature of the moon is shown by the shadows thrown by its hills, it has glens and valleys also.^j The stars too are stones.^k

As regards their relative positions, the moon is nearest the earth, then the sun, then the stars. This is given as the reason why the sun appears to move more slowly than the signs of the Zodiac, and so to be caught up with them and to pass through them in the opposite direction: the sun is nearer the earth than these constellations, and so is carried round more slowly, because the motion is swifter in proportion as one is further from the centre of the vortex, that is, from the earth.^{l, l1} This applies even more strongly to the moon, which is nearest of all to the earth. Of the stars, the fixed stars come 'first' (says Aëtius, apparently meaning 'furthest from the centre', that is, reckoning from the outside), then the planets, and then the sun, the evening star and the moon.^m It will be noticed that in these views Democritus differed from Leucippus, who said that the moon's orbit was nearest the earth, the sun's furthest, and the stars between the two.ⁿ Democritus leaves only the evening star in the intermediate position.

^a B156, A49 ^b A57, B167 ^c A101, cp A1 §44 ^d A102 ^e A60a

^f A40 ^g A39 ^h A87, 59A7z ⁱ A89a ^j A90, cp 59A77

^k A85 ^l A88 ^m A86 ⁿ 67A1 §31

^{l1} Lucretius. See Loeb trs. and note *ad loc.* by W. H. D. Rouse.

The Milky Way received special mention. When the sun at night goes below earth, those stars which are above the earth and are in the sun's rays cannot be seen because the sun's light outshines their own; but those on which the shadow of the earth falls can be seen by their own light, these form the Milky Way. These stars are very numerous, and owing to their distance from the earth, they seem to us to be one, as when grains of salt are thickly sprinkled.^a Comets he explained as an appearance due to the conjunction of planets: when the planets are near one another they give the appearance of touching and being one star, the so-called comet.^b In both these explanations Democritus followed Anaxagoras.

The earth was originally in motion, while still small and light, but as it grew heavier and heavier by the accumulation of more material, it finally came to rest.^c It had a flat upper surface which was not circular but elliptical, the length being half the width,^d in the 'middle', that is, apparently, between the upper and lower surfaces, it was hollow. Early in its development it became tilted in one direction, that is, towards the south, as the enclosing envelope was weaker there and gave it less support, this tilt has remained, because the northward parts are still unmixed, whereas the southward parts have accumulated a quantity of fruits and other growth, which make the earth heavier on the southerly side.^e Thus he accounts for the inclination of the earth's axis.

Other meteorological and geological phenomena are discussed: thunder, lightning and thunderbolts are explained as due to unequal admixture of particles, causing violent movements of or within clouds.^f Thunder and lightning occur simultaneously, though we sense them separately because sight is quicker than hearing.^g Wind occurs when many atoms are gathered together in a small space, calm when few atoms are spread out over a large space, he gave as an analogy the jostling of a crowd.^h Earthquakes are caused by the gathering of water in the hollows of the earth: as the water accumulates, the spaces cannot hold it all and it beats against the enclosing earth, causing it to move.ⁱ The saltiness of the sea is due to the same cause as accumulation of salt on land: like atoms have sought like and coagulated.^j The process is assisted by evaporation:

^a A91 ^b A92 ^c A95 ^d A94, 59A87 ^e A96 ^f A93, cp B152
^g A126a ^h A93a ⁱ A97, A98 ^j A99a

he thought that the sea was becoming less and less, and would finally dry up altogether.^a The source of the Nile is in the biggest mountains of the world, which are in Aethiopia;^b its water is derived from clouds, which are vaporized from the northern snows of the earth in the summer solstice, these are carried south, and gather there, below Egypt. The Etesian winds cause them to dissolve into violent rain-storms, which fill the lakes and the river Nile. Another suggestion attributed to Democritus was that the Nile drew its flood-waters from the southern ocean; the whiteness of the water is accounted for by the length of the journey, and its unusual taste by its being boiled on the way.^c

The Calendar already mentioned contained many meteorological observations, calculations of the length of the seasons, prevailing winds, periods of calm, rain and storm, and their connection with the rising and setting of the constellations, and with the solstices and equinoxes.^d

Biology Democritus followed Anaximander and others in thinking that the animals, including man, were spontaneously generated from the primeval slime.^e Like worms, men came out of the earth without creation and without purpose.^f Their later development by procreation is due to a natural law implanted in all animals, but whereas in animals this, as well as the after-care of the offspring with all its work and worry, is a mere instinct, man has also an acquired idea that children should be profitable to him.^g The act of coition he compared to a mild attack of epilepsy. It is a collision, like that of the atoms, resulting in the creation of man from man, animal from animal. There is a suggestion that just as the cause is a kind of disease, the result is also evil.^h

The function of procreation was closely studied. The potentiality of the seed, its power to grow, is a material thing, as well as its substance,ⁱ for it is 'breath', and breath, life or soul, like heat, is composed of the round smooth particles, the volatile fire-atoms.^j The substance of the seed is a composition, made up of the most important parts of the body: bones, flesh, sinews.^k The female is not merely a receptacle, but also gives forth seed.^l Collision of seeds is the cause of

^a A100 ^b A99, cp 59A91 ^c A99 ^d B14 ^e A139, B5 ^f A139
^g B278 ^h B12 ⁱ A140 ^j A101 ^k A141 ^l A142

creation in the organic world, as collision of atoms in the inorganic. The sex of the offspring is determined in the womb, it depends, not on temperature, but on whether the seed from male or female predominates ^a A similar reason accounts for resemblance to either parent.^a

The embryo is anchored in the womb by the navel cord; it is nourished through the mouth, by sucking certain fleshy protuberances, and hence when born it seeks the breast. It remains in the womb in order that its limbs may be moulded on the model of its mother's Aristotle reports these views as mistaken, and gives the correct explanation ^b He also gives as mistaken Democritus' view that the outer limbs of the embryo are articulated first, the inner organs later. Others quote Democritus as saying that the abdomen and head — the parts containing most empty space — are first formed.^c

The reason why some animals, such as pig, dog and hare, are polygonous, whereas others, such as man and lion, are not, is that the former have several wombs, the latter normally only one The offspring of the polygonous animals are generated not in one but in several couplings (this was corrected by Hippocrates, who pointed out that they are usually born on the same day) ^d The mule, an artificial product due to man's interference, is barren because the womb and its passages are unfitted to receive seed ^e Democritus thought that the idea of producing mules was suggested to man by the chance connection of a horse with a donkey, and mentioned as a proof of its unnaturalness the Libyan donkey, which is very large, and is used for breeding with mares; but it is necessary to shear the manes of the mares, for if they have their 'glory' they will not tolerate the donkey as a mate ^f He discussed the reason why man and some animals practise intercourse in secret;^g the causes of freaks^h and miscarriages,ⁱ and the effect of castration on growth ^j Freaks were due to a collision of seeds entering the womb at different times, this is also the cause of the varying colours of hens' eggs. Miscarriages are due to an expansion of the womb through heat, and therefore occur during the south winds. Castrated bulls have long, fine, twisted horns and flattened foreheads

The growth of teeth,^k horns,^l and quills,^m the spider's ability

^a A143 ^b A144 ^c A145 ^d A151 ^e A151, A149 ^f A151 ^g A150a
^h A146 ⁱ A152 ^j A154 ^k A147 ^l A153-5 ^m A150

to weave a web,^a the part played by water in maintaining the life of fish^b and amphibians,^c the 'wave-like' locomotion of caterpillars,^d the bones of the eagle,^e the crowing of cocks before daylight,^f the owl's ability to see at night,^g the lion's open eyes when born and when asleep^h all these things were discussed by Democritus in what must have been a valuable work on biology, used, though critically, by Aristotle in the compilation of his own treatises. In general, Democritus believed that animal instinct is a truer guide than man's appetite: the animal knows how much it needs, man does not.ⁱ Further, we are the pupils of the animals in the most important arts: spinning, building, singing.^j

The phenomena of death and decay were also studied.^k The death of the body is not instantaneous: the nails and hair still grow.^l Corpses, therefore, still have some life, and therefore some perception, at first.^m Cases of apparent resuscitation of corpses, however, can be explained away as fainting-attacks caused by a blow or a wound.ⁿ Democritus is said to have advocated mummification — the preservation of the corpse in honey — rather than cremation.^o

Of his medical works, only a few fragments remain, though he is said to have written on Prognosis, Diet and Régime,^p and on particular diseases such as fever.^q He discussed sleep, saying that insomnia is due to wrong diet,^r and that daytime sleep is a sign of ill-health.^s In general he believed that the body, if opened, would be found to be a storehouse of ills and sufferings,^t but that the power to attain health lies within us, depending as it does on the control of appetite.^u

Of his botanical works, nothing remains except the title *Seeds, Plants and Fruits*,^v which was a separate treatise in the group called *Causes*, and a passage quoted by Theophrastus for refutation, in which Democritus argued that plants with straight stems have a shorter life than those with crooked stems, because the former afford a freer passage for nourishment, while in the latter the strength goes into the roots.^w

In *Geology*, he held the view that stones, being made from atoms which have 'life', have the power within themselves to

^a A150^b A156^c A161^d A155a^e B198^f B154^g B26b-c, B209, B210^h B149ⁱ A155b^j B154^k B234^l B126^m B1aⁿ A159, B299f^o A33^p B22^q A160^r B209^s A162^t A158^u A117^v B209^w A162^x A157^y B1^z B212

take on certain forms the internal heat, and the jostling it causes, shapes the stone 'as the hammer of the smith shapes the axe and the saw'.^a The magnet's power to attract iron is due to affinity of atoms, the magnet sends out 'effluences' of its own atoms, which penetrate the iron and drive out the iron-atoms, these then return to the magnet, moving the iron with them. It was objected that this explanation did not cover the power of amber to attract chaff and other substances unlike itself.^b

Sense-perception The chief interest of Democritus in the physiological and psychological sphere was concentrated on his investigation of sense-perception, and a considerable part of this work survives. With it was closely bound up his theory of knowledge, which depended on his metaphysical position. Since only atoms and space have absolute unchanging existence,^c only knowledge of them can be real,^d but since the atoms are removed from perception, it follows that only the intellectual concept of atoms and space is genuine knowledge,^e all else, all that is communicated by the senses, is an appearance. This does not mean that it is an illusion, the appearance of things we perceive — man, plant and the rest — is produced by the combination of atoms, and their apparent change is likewise due to movements of atoms.^f To understand this is knowledge, and to use the correct terms about it, instead of the habitual ones, is truth.^g

There are therefore two grades of knowledge, the genuine and the bastard.^h There is the intellectual understanding of the atoms and their movements in and combinations with space, and there is the evidence afforded by the senses. There is no such thing as colour, but the atoms which have no quality create the appearance of qualities.ⁱ Sweet, hot-cold, colour, are notions accepted 'by custom', only atoms and space exist 'in reality'.^j But this must not lead us into denying all reality to perception. The perceptions can truly say to the intellect, if it condemns them: 'You get your evidence from us, and our downfall is your overthrow'.^k Thought depends on perception.^l

^a A164^b A165^c A49, A1 §45^d B11, B117^e A59^f A57, A58^g B26, B26a^h B11ⁱ A124, A125^j B9, B125^k B125^l A107, A110, A111

It sometimes seemed as if Democritus said that perception was truth: that all percepts were equally valid, as Protagoras taught;^a but apparently Democritus disclaimed this attitude, and like Plato, expressly refuted it.^b He often suggests that 'man is severed from reality';^c that we know nothing really, but merely receive chance impressions as individuals;^d and that it is impossible to understand individual things.^e But his whole metaphysical position as well as his detailed work on sense-perception prove that these sayings were intended to apply rather to the ordinary run of men who accept their impressions as valid, and not to the scientist who has grasped the nature of atoms and space. For the latter there is a criterion, the validity of which extends into the moral world: the good and true are the same for all, though the pleasant differs for different persons.^f For the scientist, chance and intelligence are not at war,^g and to seek the causes of things is supremely worth while.^h Such knowledge is not acquired by trying to understand everything, which merely leads to ignorance of everything,ⁱ it is a knowledge of essentials. Being akin to nature, it has power to shape a man,^j to teach him the technique of right living,^k and the production of good things.^l

Democritus, therefore, believing that the way to truth lay through sense-perception rightly understood, elaborated a theory of sense-perception by which the various grades of reality could be measured. In the first place, perception is a corporeal entity,^m caused by the actual movements of atoms in space, and atoms combined with space, and their effect on the organs which receive them. Secondly, the whole body takes part in the process of thinking,ⁿ which is 'the same as', that is, inseparable from, perception.^o Thirdly, all percepts are 'true',^p in the sense that they are all due to actual events, they are different to healthy animals and ourselves, and different at different times to the same person, but this is due to the differences in the receiving organs, the cause of the percept remains a reality, and in that sense all percepts are 'equal', and one set is not more real than another.^q Fourthly, though we recognize only five senses, there are more, both in man and the non-rational animals, and in the gods.^r The senses, in fact, exceed

^a A113, A101, A105, A112 ^b A114 ^c B6 ^d B7 ^e B8, B10 ^f B69
^g B119 ^h B118 ⁱ B169 ^j B33 ^k B172, B173, B181 ^l B182 ^m A104a
ⁿ A107 ^o A105 ^p A113, A114 ^q A112, cp A163 ^r A116

the percepts, but they escape notice because there are no percepts to fit them.^a Fifthly, Democritus, like the majority of the natural scientists, reduced all perception to touch—absurdly, Aristotle says.^b

A full and critical account of Democritus' views on sense-perception is preserved by Theophrastus.^c The recognized percepts are sight, hearing, taste, smell, touch, the last including the sensations of hard and soft, hot and cold, heavy and light. Of these, he paid the greatest attention to sight, on which his theory was original. He believed that all objects constantly give off material images of themselves, which are impressed on the air between the object and the eye, as on wax. This impression is then reflected back to the eye, into which it enters, and is communicated to the rest of the body. The best type of eye is that which admits the images easily.^d Theophrastus had no difficulty in criticizing this theory: for instance, if the image is stamped on the air in front of the object, how is it we do not see it in reverse? What happens when several things are seen in the same place? How do we see one another, past the surrounding images? Why do we not see ourselves? Though Democritus tries to account for everything, for instance the connection between distance and size, he leaves much to be explained.^e Aristotle remarked that it was odd that Democritus did not wonder why the eye alone, of objects that receive reflections, has the power to see,^f and also that Democritus was wrong in saying that if the intervening space were empty, we would see correctly even if an ant were in the sky.^g

Colour in itself does not exist, for the atoms and space are colourless, but their combinations take on colour through differences in the shape, arrangement and position of the atoms.^h There are four primary colours, white, black, red, yellow, all others are made by combining these.ⁱ White is identified with the smooth, that is, with whatever is not shadow-forming. Bright white is made of shapes 'like the inside surface of shells'; powdery white of circular atoms arranged in groups of two set slantingly with regard to each other. Black is made up of rough uneven particles which cast shadows and are difficult to penetrate. Red is made up of the

^a A115^b A119^c A135^d A135 §§50^e A135 §§51-4^f A121^g A122^h A123, A124, A125ⁱ A125; A135 §73

same kind of atoms as fire, but larger: things grow red when heated. Yellow is made from solid and emptiness combined, the colour arising out of position and arrangement. All other colours are made by admixture. gold and bronze from white and red, purple from white and black and red, different greens from black and yellow, purple and blue, or yellow and purple; and so on. The colours are innumerable, according to the quantities mixed ^a

It is clear from this summary that Democritus had experimented considerably with the mixing of colours. He endeavours to explain, not only the colours, but the reasons why we find some, such as purple and gold, more pleasing than others ^b. Since he makes purple from white and black and red, and makes green from black and yellow, it is clear that black to him means also a dark blue, so that his primary colours are white, red, yellow and blue-black. Theophrastus complains that his explanations are inconsistent, and do not fit the facts: why should yellow be the only colour dependent on admixture of atoms and space, instead of on shapes of atoms? Why should white be equated with smoothness and transparency, and black with roughness? Many smooth things look black, and rough things white, and circular things can cast shadows as well as any other shapes. How does his explanation of black account for shadow, which is an interception of light? Why does he not make his primary colours opposites? Why are some colours simple, others compound? Again, much remains to be explained, though Theophrastus admits the difficulty of the subject ^c.

Hearing differs from sight in that the organ of hearing receives the percept direct, whereas in sight there is a double process. (He cannot have said, as one late authority gives it, that hearing merely receives, whereas sight goes out to meet its object, for this is inconsistent with Theophrastus' clear explanation that the eye receives a reflection of the image impressed on the intervening air.)^d Sound is corporeal, it enters throughout the whole body, but especially through the ears, which are like vessels designed to collect and retain it in motion.^e Sound is produced by a breaking-up of the air into bodies of similar shape by the impact of the sound-particles;

^a A135 §§73-8, A126^d A126a^b A135 §§76, 77^e A127, A135 §55^c A135 §§79-82

and the two then revolve together in an admixture.^a He describes the kind of ear best suited to hearing: the cavity must be large and dry and all passages clear. Theophrastus objects to the idea, peculiar to Democritus, that sound enters throughout the whole body, and is also distributed throughout the body from the ears: this is a mistaken attempt to explain why the rest of the body is affected by sound, even if the body has concurrent sensation, this does not prove that it hears. It reacts similarly in the case of the other senses, and not only the senses, but also the mind.^b

Taste depends on the shapes of the component atoms. sharp is composed of angular small fine particles with penetrative power; sweet is composed of circular atoms, and so on. In each of the tastes, sweet, bitter, sharp, salt, astringent, there is an admixture of particles of all shapes, but the prevailing shape gives the taste.^c Again, the condition of the recipient can cause a difference in taste, or even cause the same percept to produce an opposite result.^d Theophrastus, while commending the greater thoroughness and consistency of his application of his theory to taste, objects that it does not account for change, nor for the different effect of the same object at different times or on different subjects. If taste depends on atomic shape, the same object should always produce the same effect, for round is round to all creatures at all times.^e Democritus has nothing special to say regarding the organ of taste.^f

He had nothing special to say about smell, except that it is caused by what is fine flowing off from what is heavy. But its nature, and what it is that causes the experience, he does not say, important though this is, Theophrastus remarks.^g

As for the percepts of touch: heavy and light depend directly on atomic composition. If the atoms are separated, their weight depends on their size, but in compounds the lighter body is that containing the most space, the heavier that containing the least.^h Hence a small bulk is often heavier than a large bulk, for example, grass than wool.ⁱ Similarly with hard and soft. the dense is hard, the rare is soft. There are also differences of arrangement, which affect the relations between heavy-light and hard-soft. iron is harder, but lead is

^a A128^b A135 §57^c A129, A135 §§ 65-7^d A130, A135 §67^e A135 §69, A131, A132, A134^f A133^g A135 §82^h A135 §61ⁱ A60

heavier. This is because iron is unevenly packed. it has more space as a whole, but it is densely packed in certain places, whereas lead contains less space but has it more evenly distributed.^a The sensation of hot-cold depends on atomic shape ^b

Thus the sensations themselves can be graded, according to whether they depend on composition or arrangement of atoms and space, or on the shapes and sizes of the atoms. They are 'real' in that they have a corporeal cause, they are 'appearance' in that they are not what they seem to the experiencing subject, and give rise to different experiences in differently-constituted subjects.

His psychology was an extension of his theory of sense-perception. The soul and the mind are the same.^c The mind or soul is made of smooth round fire-atoms,^d and has power of motion owing to the smallness of its particles, it being their nature never to remain still ^e The soul is a body within the body,^f by its own motion it moves the body, just as Daedalus was able to make a wooden statue of Aphrodite move by pouring molten silver into it ^g The soul is twofold. it consists of the reasoning part resident in the bosom,^h and the unreasoning part scattered throughout the body; but nevertheless it can be said to be indivisible, for its substance is the same, and thought is the same as feeling ^h Thought occurs when the admixture of soul is correctly proportioned throughout the body. if one becomes too hot or too cold, one's thinking alters ⁱ The maintenance of life depends on breathing because inhalation prevents the exit of the soul-particles, death is the exit of these particles from the body,^j so that the soul perishes with the body,^k though corpses retain some of the life-principle for a time, and everything has a share in some sort of soul.^l He does not explain why all must die, and why death comes when it does, being natural in old age and unnatural when by violence ^m

Cicero complained that Democritus gave various opinions on the nature of divinity. sometimes he said that the gods were the visions we see, often deceptive or injurious, sometimes the nature that produces these, sometimes the principle of Mind

^a A135 §62 ^b A135 §§63, 68 ^c A101, A1 §44, A113 ^d A1 §44, A102, A106

^e A104 ^f A104a ^g A104, A103 ^h A105, A107 ⁱ A135 §58

^j A106 ^k A109 ^l A117 ^m A106

¹ According to Aetius, who elsewhere says (A105) that Democritus like Plato and Hippocrates placed the ruling faculty in the brain

in the universe or in ourselves.^a He seems, however, to have believed in a divinity of a corporeal kind, made of fire-atoms, like the soul in ourselves;^b the reason for the belief in gods is that there are certain visions,^c some beneficent, some harmful, which visit men, especially in dreams;^d these visions are real, and not easily destroyed, but not immortal.^e Belief in gods was supported by fear of the forces of nature — thunder, eclipses and the rest^f — and by gratitude for good gifts, which led men to pray to a supposed omnipotent creator.^g The names given to the gods are attempts to represent them vocally.^h Prayer, however, is useless: the power to attain gifts such as health lies in oneself,ⁱ and prayer to idols is most useless of all, for though they are bedecked with raiment and jewellery they have no heart.^j He does, however, in his ethical writings sometimes suggest that the gods care about virtue,^k and are the dispensers of what is good, not what is bad, man's folly being responsible for the latter.^l It follows that if the gods are visions present in the air, they must also impinge on the animals, so that they too have the concept of divinity.^m There is no divine creator, all is due to natural causes,ⁿ and it is hard to see Democritus' gods as other than otiose. His system does not require their help; but the belief in them has to be accounted for, and as all percepts have some foundation in reality, and men undoubtedly see dreams and visions of the gods, the gods must have corporeal existence, though they are not creative or immortal. He believed that dreams in general were emanations from bodies, especially living bodies; and that therefore they are subject to material laws: for instance, they are less trustworthy in autumn, owing to the disturbance of the air at that time.^o Some visions are wilfully emanated by persons wishing to injure another.^p He is said to have believed in divination,^q and to have prayed to meet with only propitious visions.^r

Ethics. His ethical position was that happiness is the goal, his terms for happiness were numerous, and serve as definitions. It is, in the first place, a property of the soul,^s and does not dwell in flocks of cattle or gold; the soul is the dwelling-

^a A74 ^b A74 ^c A77, A78 ^d A136, A137 ^e B166 ^f A75
^g A75, B30 ^h B142 ⁱ B234 ^j B195 ^k B217 ^l B175 ^m A79
ⁿ A88 ^o A77 ^p A138 ^q B166 ^r B170

place of good and evil fortune,^a and is responsible for even bodily health,^b because its function is to supervise a right technique of living, and above all to discriminate between pleasures and desires. Pleasure and its opposite are the criterion of advantage;^c but in order to obtain pleasure and pain, knowledge is necessary: evil can come out of good, if one does not know how to use certain things aright.^d There is in the soul a Logos, which will, if exercised, accustom it to derive its pleasure from within.^e

If this discrimination of pleasures be rightly carried out, a state of mind is attained which he calls Well-Being, or Cheerfulness, or sometimes negatively, Freedom from Disturbance, Freedom from Alarm, Freedom from Wonder.^f This is the best condition for man, and it is attained only by effort.^g There are many rules given for the attainment and preservation of the happy state, but all in the last resort depend upon knowledge. Fear and superstition, derived from mistaken views on nature and divinity, and on the after-life, must be eliminated. the fear of death often derives from the fear of an after-life,^h and this leads to a foolish desire for long life, even when life is not enjoyed.ⁱ Old age is, physically, a general deprivation: all the organs are present, but they all lack something.^j Nevertheless, the flower of old age is moderation, as strength and beauty are the blessings of youth, and if the life has been well-spent, old age is preferable to youth, for the old man has had youth, but the young man does not know whether he will reach old age: the perfected good is better than the uncertain future.^k Thus in spite of the advantages of youth, the happiness of Well-Being is more germane to age, provided that foolish regrets and mistaken fears are eliminated by right thinking.

But the chief necessity, if one is to achieve well-being, is to do nothing to excess. To overstep due measure makes the most pleasant things unpleasant,^l while moderation multiplies pleasures and magnifies pleasure.^m The animals are wiser than Man in this regard as in others. they know how much they need, and their self-control is instinctive.ⁿ Man's bodily needs

^a B171 ^b B159, B187 ^c B4, B188, B189 ^d B173, B172, B31 ^e B146

^f A167, A168, A169, A1 §45 ^g B182 ^h B199, B297

ⁱ B205, B206, B200, B201 ^j B296 ^k B295, B202 ^l B233 ^m B211

ⁿ B198

¹ His favourite terms were εὐθυμία and εὐεστία. Others given are ἀταραξία, δαδαιβία, ἀδυναμία, and even συμμετρία and ἀρμονία.

are available to all without trouble; things acquired with trouble are desired not by the body but by the ill-regulated mind ^a Enjoyment derived from (excessive) eating, drinking and love-making is brief, and the painful consequences are many; moreover the desire is no sooner satisfied than it recurs.^b In attaining such pleasures, men sacrifice health, and then pray to the gods to restore it, not knowing that the attainment of health depends on themselves.^c Moderate enjoyment is necessary to happiness: the life without festivity is a long road without an inn,^d and expenditure at the right time has its virtue; as well as fasting and thrift, but the secret of happiness lies in judging the right time.^e

The right-minded man, therefore, practises moderation above all things, and in choosing between pleasant things, he remembers that the rarest afford the greatest pleasure,^f and that the contemplation of beautiful works gives most pleasure of all.^g He avoids foolish hopes,^h though not all hope is denied him: the hopes of the rightly-trained are preferable to the acquired wealth of the ignorant.ⁱ He avoids envy: to attain to a cheerful calm, one must not let the mind dwell on the fortune of those considered fortunate because of riches. Envy leads to restless activity and the risk of breaking the law.^j He avoids the passion for excessive wealth, which while unsatisfied is more painful than poverty: the greater the passion, the greater the need it creates.^k He avoids covetousness,^l and miserliness: misers, like bees, behave as if they were going to live for ever.^m He avoids bellicosity: in planning to hurt an enemy, one loses sight of one's own advantage.ⁿ He avoids controversies with wranglers and word-twisters.^o He does not take pleasure in the misfortunes of his neighbours, for this shows ignorance of the fact that fate is common to all, the man who has his own causes for joy does not need such false enjoyment.^p He bows to the inevitable conditions of life:^q if sorrow befalls him, he conquers uncontrollable grief by means of intelligence,^r if he is poor, he learns to enjoy what he has, by moderating his desires,^s if he has to work, he tries to avoid work unaccompanied by success or the hope of success,^t but he remembers

^a B221, B284, B285, B286^b B235^c B234^d B230^e B229^f B232^g B194, B207^h B292ⁱ B185^j B191^k B219^l B222^m B227ⁿ B237^o B150^p B281^q B289^r B290^s B291, B284, B231, B224^t B241

that even continuous toil grows easier with custom.^a If his work is voluntary and therefore pleasant,^b he limits its scope. It militates against well-being to take on too many activities, public or private, that is, to go beyond one's powers.^c

The virtues of courage and justice are also necessary to well-being (though Democritus has less to say about these). Courage is displayed not only in overcoming enemies but in mastering pleasures: some men who have ruled cities have been enslaved by women.^d Courage is the source of action, though chance is arbiter of the result.^e Forgetfulness of one's own sufferings breeds boldness.^f Courage minimizes disasters.^g But of course the task of the right-minded man is to eliminate all unnecessary fears, so that courage is much reduced in importance, and becomes subsidiary to Moderation. Of justice he says that its prize is confident judgement and freedom from fear, the end of injustice is fear of disaster.^h Even the hope of evil gains must be avoided;ⁱ and wealth derived from evil activity makes disgrace more conspicuous.^j In general, the doing of good works makes for happiness; the unjust man, he who neglects his duty, is full of care.^k These virtues are based on knowledge: a man who acts rightly through intelligence and knowledge becomes brave and upright.^l

Virtue brings peace of mind, crime brings fear, but this is not the reason for practising virtue. One must look not to the opinion of the world, but to oneself, one must not be more ready to do wrong if no one will know than if all will know. One's own opinion must stand as a law in one's own soul, forbidding wrong-doing.^m This conscience can be cultivated by early education.

Education Education is a discipline in prosperity, a refuge in adversity.ⁿ It must be begun young. Wisdom is not the automatic fruit of time, but of early education acting on natural endowment.^o It is not easy. Success in educating one's children means strife and care, failure means grief beyond all others.^p Nevertheless, it can be done without great expense, and the result is to build round them a fortification and a safeguard, both for themselves and their possessions.^q The

^a B241^b B240^c B3^d B214, B236^e B269^f B196^g B213^h B215ⁱ B221, B220^j B218^k B174^l B181^m B264, B244, B152ⁿ B180^o B183^p B275^q B280

chief factor is example. the self-control of the father teaches the children,^a and constant bad company increases badness of character.^b But some qualities in parents lead to the opposite in children, for instance, excessive thrift.^c The best way is to let one's children practise the handling of property by sharing it out among them, while keeping an eye on them to see that they do nothing foolish: this makes them thrifty and eager to earn, and arouses mutual competition.^d The worst training for youth is frivolity: for it breeds those pleasures from which evil comes.^e The best training is work, which is necessary for letters, music and gymnastics, and above all the co-ordination of all these, that is, reverence.^f

It seems that in the old controversy regarding the blessings of marriage and family life as opposed to single life, Democritus took the view of Thales, that to have children of one's own is a mistake, and that adoption is preferable to procreation. But he seems to have taken this view not so much because of the misfortunes and grief that may arise because of their loss, as because of the danger of having bad children. The risk is great, the harvest rare and meagre.^g In adoption, one can choose as one wishes.^h He does, however, suggest that man is less wise than the animals in that he expects a reward for bringing up his offspring, whereas they do it by instinct and without hope of gain.ⁱ Of women, he said that they are quicker than men in malignity,^j that their adornment is lack of garrulity, as well as sparing adornment,^k and that to be ruled by a woman is the uttermost outrage for a man.^l

Politics In education, persuasion and the inculcation of good habit, leading to right thinking, is the method advised. The wise man will not need laws or compulsion, but will live freely,^m while the man who is prevented from crime merely by law will tend to sin in secret.ⁿ As, however, men if left to act as they please will harm one another, laws are a necessity to a civilized community.^o The law wishes to improve men's lives, and it is able to do so when they are willing to accept its benefits, for it shows to those who obey it their own particular virtue.^p The aim of the law is to create unity of outlook and

^a B208 ^b B184 ^c B228 ^d B279 ^e B178 ^f B179
^g B276, cp A170 ^h B277 ⁱ B278 ^j B273 ^k B274, B110
^l B111 ^m A166 ⁿ B181 ^o B245 ^p B248

aims within the State; on this, the greatest undertakings, including wars, depend.^a Envy, the cause of strife, must be eliminated,^b civil war brings disaster on both conquerors and conquered.^c The good of the community must be placed first, private quarrels and the amassing of power must not be pursued beyond this, as the well-run State is the strongest protection, and if it is safe, all is safe, whereas if it is lost, all is lost.^d So too, general distress is harder than that of individuals, for there remains no hope of assistance.^e

The law exists not only to prevent wrong-doing, but to punish it. The punishment of crime is a part of justice, the neglect of it is injustice.^f It is therefore important that the law be administered by trustworthy magistrates. Magistrates cannot be made perfect by law, for change of position alters everybody, nevertheless, legislators must envisage the faultless magistrate, and protect him by some means from falling under the control of those whom he convicts of wrong-doing.^{g, g¹} The appointment of worthy magistrates is a proof of justice and virtue,^h when base men enter on office, the less worthy they are, the more neglectful — filled with folly and recklessness.ⁱ Good men should not let their private affairs suffer from neglect, though neglect of public affairs will bring an ill reputation.^j As with the individual, so with those who have any office in the State the law in their own soul must keep them from wrong-doing, rather than public opinion. Thus, anyone who acquits a criminal deserving death, exile, imprisonment or any other punishment, does wrong, whether he acts for the sake of a bribe, or from personal inclination, and will carry the burden on his conscience.^k The mistakes of men in office are remembered rather than their successes, and this is right just as he who returns a deposit deserves no praise,

^a B250^b B191^c B249^d B252^e B287^f B261^g B266^h B263ⁱ B254^j B253^k B262, B264

^{g¹} Diels takes τοὺς ἀρχοντας as the object of ἀδικεῖν, and translates 'There is no means of protecting magistrates from hurt'. He then can make nothing of the next sentence, and has to suppose a lacuna between τὸν and αὐτόν. Taking τοὺς ἀρχοντας as the subject of ἀδικεῖν, I translate this and the following sentence as it stands. 'There is no means under the present constitution by which magistrates can be prevented from wrong-doing, however good they may be. For it is not likely for anyone else, [any more] than for oneself, that he will show himself the same man in different circumstances,' that is, power changes men. Diels' insertion would read 'It is not right that a magistrate should be answerable to others than himself, or that after his year of office he should be controlled by others' (who would avenge themselves on him).

while he who does not deserves punishment, so with the magistrate, he was elected to do well, not to do badly.^a

It follows that, for the protection of the community, anything that does harm must be killed, the man who does this does a service in any community, and is worthier than he who does not,^b the laws must exempt him from all penalty.^c This applies to both animals and men: an enemy of the State should be put to death according to ancestral law, unless a special prohibition — sacred law, treaty or oath — forbids it.^{d, d1} Anyone killing a brigand or pirate is exempt from punishment, whether it be done with his own hand, or by instigation, or by vote.^e Intelligence should avert injustice, but only stupidity would fail to avenge it when committed.^f

Dealing with economics, Democritus states the general rule that poverty and wealth are relative terms: poverty means lack, wealth means superfluity,^g so that if one's desires are not great, a little will seem much, for small appetite makes poverty equivalent to wealth.^h Money wisely used is beneficial to the community, leading to generosity and public service, foolishly used, it is a burden, that of maintaining all and sundry.ⁱ Extravagance is to property what canker is to the body.^j But if the rich and influential can bring themselves to lend to the poor and help them, herein lies pity, an end to isolation, friendliness, mutual aid, unity among the citizens, and other blessings such as no man can enumerate.^k Nevertheless, poverty under democracy is as preferable to so-called prosperity under autocracy, as freedom is to slavery.^l He was not in favour of communally-held property, even within the family, he wished fathers to divide their property among their children in order to stimulate thrift, industry and competition, on the grounds that the income from communally-held property gives less pleasure, the expenditure less pain.^m He was in favour of voluntary generosity and mutual aid, together with the control of individual desires and the curbing of individual ambition with a view to the good of the whole: or as his proverb has it, 'The shared fish has no bones'.^{n, n1}

^a B265 ^b B258 ^c B257 ^d B259 ^e B260 ^f B193 ^g B283

^h B284, B285, B286 ⁱ B282 ^j B281 ^k B255 ^l B251 ^m B279 ⁿ B151

^{d1} Democritus thus takes cognizance of sacred laws protecting even dangerous animals, such as the crocodile in Egypt

ⁿ¹ *I.e.* one man takes the upper, another the lower portion of the fish, leaving the bones in between. Equal sharing does away with friction over 'mine' and 'thine'

Within the State, the family is the most important unit. He gives directions for its right regulation, the management of its property, the education of the children. While recognizing that the founding of a family is instinctive for ordinary men, he believed that the philosopher would do well to avoid it; so too, while recognizing to the full the importance of the State, he envisaged for the philosopher a wider horizon. To a wise man, the whole world is open, and the native land of a good soul is the whole universe.^a The hardships of travel abroad teach self-sufficiency: bread and bed are the sweetest cures for hunger and fatigue.^b

The system he advocates is democracy, with election of magistrates, and obedience to the law. Freedom of speech is the sign of freedom, but the danger lies in discerning the right occasion.^c Truth, not wordiness, should be the rule.^d Good oratory cannot obscure bad actions, nor can good actions be vitiated by blasphemous words.^e The assignment of praise and blame are important, to do this wrongly is easy, but reveals a corrupt character.^f Oaths must be kept; bad men, when they escape, break the oaths they made in time of stress.^g Loyalty, not flattery forged by fear, must be encouraged.^h He accepted the institution of slavery, saying that slaves should be used as parts of the body, each for his own function.ⁱ He praised the art of statesmanship, according to Plutarch, as the greatest of all, and urged that it should be learnt thoroughly, and its toils pursued, for it is the source of great and glorious blessings to mankind.^j

Of the remaining works attributed to him, only a few scattered fragments remain. In his work *On Poetry* he praised Homer as inspired,^k and said that whatever the poet writes with inspiration and sacred spirit is beautiful.^l Cicero extended this into: 'Democritus, like Plato, says that there is no poetry without madness.'^m Music, Democritus said, is the youngest of the arts, arising not from necessity but from superfluity.ⁿ We learn singing from the birds, swan and nightingale.^o On Farming, he is said to have discussed the best aspect for vineyards, the unsuitability of walls as boundaries for an estate, the

^a B247 ^b B246 ^c B226 ^d B225 ^e B177 ^f B192 ^g B239 ^h B268

ⁱ B270 ^j B157 ^k B21 ^l B18 ^m B17, cp Plato, *Phaedr.* 245A

ⁿ B144 ^o B154

^p The saying 'Rule belongs naturally to the stronger' is probably not his, if it is, it has been torn from its context (B267)

spontaneous generation of bees.^a On Mathematics, he posed the problem. 'If a cone is intersected parallel to its base, are the circles equal or unequal?' If the circles are equal, the cone is a cylinder, if not, it has a series of minute steps.^b He described the sphere as a kind of angle for if that which is bent is an angle, then that which is bent wholly in upon itself is a complete angle.^c He experimented on the shape of flames, saying that they are pyramidal because of the cooling at the tip.^d

Forged Writings. In later times, owing to Democritus' prestige and his known travels in the East and Egypt, his name was attached to a number of writings of magical and unscientific outlook. One of the authors of such works was Bôlus^e of Mendê in the Nile Delta, called by Suidas Bolus-Democritus,^f and described as a medical writer, according to Columella, his work entitled *Manual Operations* was falsely ascribed to Democritus.^g Pliny accepted the work as by Democritus,^h but Aulus Gellius attacked him for so doing, and said that Democritus' illustrious name was being misused by those who attached it to works so unworthy of him.ⁱ Other works by Bolus were entitled *Potent Natural Products*, and *On Sympathetic and Antipathetic Substances*; these were sometimes correctly attributed to him,^j sometimes to Democritus.^k It was believed by some, principally Pliny, that Democritus was the chief exponent of the magic art, as Hippocrates was of medicine, and that he derived this lore from the secret teachings and writings of priests and Magi.

Pliny mentions as the chief names in the history of magic, Zoroaster and Osthanes (Ostanes), the latter having accompanied Xerxes on his campaign against Greece and sowed the seeds of this art wherever he travelled, he induced in the people of Greece a rage for this kind of knowledge,^l which was pursued by the great men of all times; Pythagoras, Empedocles, Democritus and Plato travelled in search of it, and practised it in secret. Denial of Democritus' authorship of these works, Pliny says, is vain. This tradition persisted to the end of classical antiquity, linking Democritus to the literature of alchemy. Syncellus (eighth century A.D.) speaks of Democritus

^a B27, B28^b B155^c B155a^d A73^e See Ch 78 below^f B300, 1^g B300, 3^h B300, 6ⁱ B300, 7^j B300, 4^k B300, 3^l B300, 13

of Abdera as initiated by 'Ostanes the Mede' in Egypt, when the latter was sent by the Kings of Persia to control the religious life of Egypt in the temple of Memphis; Democritus, he says, wrote on Gold, Silver and Precious Stones, that is, their transmutation from other substances.^a A lost work entitled *The Physics and Mystics of Democritus* gave a detailed account of the alleged initiation, and of alchemistic lore.^b

The works of Bolus and other writers in this tradition contained magical recipes for curing disease (in men and animals) and madness, peculiar properties of certain herbs, transmutation of substances. Examples of magical cures are for murrain in sheep, dig a ditch on the threshold of the fold, bury there a live sheep with this disease, and allow the rest of the flock to cross over the place.^c To get rid of caterpillars let a woman in menstruation walk, barefoot and with her hair down, three times round one altar, the insects will fall off and die.^d A madman is cured by hanging a leather amulet round his neck,^e a mad elephant by seeing a ram,^f snakebite is cured by playing the flute.^g Galen says that some of the magical prescriptions are disgusting and wicked, some forbidden by law, and he quotes Xenocrates (first century A.D.) of Aphrodisias in Cilicia as having described diseases cured by eating the human brain, flesh or liver, or by drinking a potion made of human bones, skin or even blood.^h Pliny attributes the origin of these horrors to Ostanes, and says that there exist commentaries of Democritus saying that the bones from the head of a criminal are more beneficial for some complaints, for others those of a friend and guest.ⁱ

The alchemistic writings sometimes attributed to Democritus were also said to have been derived from 'the great Ostanes', and to have been embodied in four books *On Dyeing*.^j A writing *On Dyeing* by Bolus also existed, but seems to have been a purely chemical work. According to Seneca, the colouring of stones in imitation of precious stones was a flourishing industry, and a lucrative fraud.^j This is different from the claim actually to change the metals and stones, for instance, 'how to make gold from cadmia stone and other substances, and what marvels come about from heating and intermingling', which was what Democritus was alleged to have learnt from

^a B300, 16 ^b B300, 15-18 ^c B300, 1 ^d B300, 1 ^e B300, 12
^f B300, 5 ^g B300, 7 ^h B300, 13a ⁱ B300, 17
^j B300, 14

Ostanes ^a The motto of the Magi was: 'Nature delights in nature, nature controls nature, nature conquers nature.'^b

In the British Museum is a papyrus of the third century A.D. containing a series of 'Jocular Prescriptions of Democritus' The first prescription gives a recipe for making bronze look like gold, others are practical jokes, hints about food, aphrodisiac recipes, and so on ^c A fourth century magical papyrus gives a means of prophesying whether a sick man will live or die.^d

The Corpus of Democritean *Gnômae* found in a Codex now in Paris contains some sayings attributed to Democritus elsewhere, but others are platitudinous and might have been said by anyone, like many of those included in the *Gnômae* of 'Democrates' ^e Among the sayings elsewhere attributed to Democritus are echoes of Heracleitus,^f Socrates^g and others; and some of those listed in the Corpus of Democritean *Gnômae* are shortened forms of genuine quotations

References to Democritus and his opinions are found in a fragment of *The Foster-Brothers*, a comedy by the Athenian Damoxenus, where his views on diet and health are satirized,^h in the forged 'Letters of Hippocrates', which are believed to be a compilation of the time of Tiberius, written by someone who knew some of the writings of Hippocrates, but nothing of those of Democritus,ⁱ and in a book *On Cheerfulness*, said by Stobaeus to be by Hipparchus the Pythagorean.^j The 'Hippocratic Letters' tell a story of how the Abderites apply to Hippocrates to cure Democritus of his madness and his laughter at mankind, Hippocrates after conversations with Democritus is convinced that Democritus alone has the wisdom and sanity which is taken by the rest of the world for madness. A long description of man's physical structure is put into the mouth of Democritus, who is shown as dissecting animals to find out where the bile lodges. His views on cosmology, on perception and visions, and on the folly of mankind are also touched upon The passage from Hipparchus gives instruction on how to attain to imperturbability and retain it under various afflictions such as loss of money, or of children, and the like

^a B300, 18^b B300, 17^c B300, 19^d B300, 20^e B35-B115^f B64, B65, B98, B109a, B236, B304^g B45, B83^h C1ⁱ C2-C6^j C7

Originality. Democritus was often accused of plagiarism. His debt to Leucippus was obvious,^a and he is said to have admired Pythagoras and borrowed from him extensively.^b He is also said to have adopted several of Anaxagoras' meteorological explanations,^c in spite of the alleged quarrel between them, and although Democritus accused Anaxagoras of plagiarism from ancient sages.^d Some brought a similar charge against Democritus, saying that the atomic theory was the work of a Phoenician named Môchus who lived before the Trojan War.^e

Influence Democritus was ignored by Plato and jeered at by the Academy,^f yet his theory of knowledge, with its distinction between reality and appearance, was the forerunner of the more elaborate theory of Plato. The interest he aroused in Aristotle and his school is evident from their careful and critical summaries of his opinions. Epicurus, at first calling himself a Democritean and praising Democritus as having been the first to touch upon true knowledge, obviously owed the whole scientific basis of his teaching to Democritus, and also the germ of his hedonist theory, he later came to think of himself as entirely original, and violently repudiated all debts to others, including even Democritus.^g

69 NESSAS

NESSAS of CHIOS lived in the late fifth and early fourth centuries B.C.

Nessas was said to have been a pupil of Democritus, and to have taught Metrodorus, or perhaps to have studied with Metrodorus under Democritus.^h He is generally said to have been a native of Chios.ⁱ

Nothing is left of his writings except a metrical comment on Homer,^j and an etymological comment on Hermes' title *Diaktoros* as meaning 'Conductor of souls'.^k

^a B4b ^b B 0a, A1 §38 ^c A91, A92, cp 59A80-1 ^d A1 §§34, 35 ^e A55

^f A81 ^g A51, A52, A53, A74, A77, A170 ^h A1, A2 ⁱ B1 ^j B2

^k Diels the name Nessas suggests that he came not from Chios but from Abdera, in the neighbourhood of which the river Nessos or Nestos flows into the sea. Possibly Nessas went to Chios from there, to teach Metrodorus (*Vors* II p 230, n)

70. METRODORUS OF CHIOS

METRODORUS of CHIOS lived at some time during the fourth century B C.

Metrodorus was the son of the well-known Chian statesman Theocritus, the contemporary of Theopompus and opponent of Alexander. Theocritus was himself a pupil of one Metrodorus, who like Theopompus had studied under Isocrates^a when the latter opened his school in Chios after the end of the Peloponnesian War, so that Metrodorus the philosopher appears to have been named after his father's teacher. Some say that Metrodorus studied under Democritus himself, but others, with more probability,¹ say that he learnt Democritus' teaching from the obscure Nessas^b. Metrodorus' pupil was Diogenes of Smyrna, the teacher of Anaxarchus. Some wished to connect him directly with Epicurus,^c but the latter seems to have studied Democritean doctrine from Democritus' own writings,^d and from Nausiphanes of Teos, whom he reviles.^e

Metrodorus' father was the leader of the anti-Macedonian, democratic party in Chios, in opposition to the party headed by Theopompus. Yet no trace of political interests can be found in the references to Metrodorus' views, he seems to have occupied himself solely with physical science and epistemology, his views on which he set out in a book *On Nature*. A work on the origins and customs of Ionia, written by a Metrodorus, was mentioned by Plutarch,^f but it is not known if the author was the same Metrodorus. Another work, 'on Trojan matters', expressly attributed to Metrodorus of Chios, is concerned with Homeric criticism.^g There may be a confusion with Metrodorus of Lampsacus,^h but since Democritus was interested in this subject, he may have influenced his pupils and their followers.

^a A2 ^b 69, 1, 2, 70A1 ^c A6, A7 ^d 68A52 ^e 75A1, 75A9

^f B6 ^g B3, B4 ^h cp ch 61

¹ Theocritus, father of Metrodorus, was put to death in the reign of Antigonus Gonatas, that is, between 323 and 301 B C, he was therefore probably born between 400 and 380 B C. His son therefore cannot have been born much before 380 B C, and may have been born considerably later. Hence it is unlikely that he was a pupil of Democritus, the latest date for whose death is given as 359 B C. It is much more probable that Democritus' doctrines were brought to Chios by Nessas.

It is stated that Metrodorus in his book *On Nature* began by a complete denial of all possibility of knowledge: 'I deny that we know whether we know anything or nothing, I deny that we know even whether knowing or not knowing exist, nor in general whether anything exists or not'.^a He added further 'Everything exists which anyone thinks.'^a He therefore went further than the most nihilistic of the Sophists, who must have influenced him, though this is not stated. It appears that he took Democritus' theory of knowledge to mean that things are known by appearance only, and that we cannot know anything exactly, as our perceptions cannot give us exact knowledge of anything, though we believe they can.^b There is no sign that he accepted Democritus' theory of the two sorts of knowledge, 'real' and 'bastard'. He did, however, rob even his own theory of any pretension to validity by saying that we cannot know even whether we know or do not know.^c He was grouped with Anaxarchus and Monimus as one of those who had done away with the criteria of knowledge,^d and his views were said to have 'given a bad start to' Pyrrho.^e

Since these were his own words, the attribution to him of Parmenidean theories on Being, that it is eternal, boundless and motionless,^f must be mistaken. It is also strange to hear from Theophrastus that Metrodorus gives the elements as practically the same as those of Democritus, that is, the Full and the Empty, Being and Not-Being, though (Theophrastus adds) in other respects he has a method of his own.^g It is probable that like all who deny the existence of reality and knowledge, he was compelled to leave this position and deal with the world of sense-perception, in order not to be reduced to silence. He is said to have accepted the Democritean view regarding the existence of innumerable worlds: infinite causes give infinite results, and it would be as silly to suppose that there is only one world in infinite space as to think of only one ear of corn growing on a great plain.^h Each revolution among the innumerable atoms causes a world.ⁱ Outside the world as well as in it is empty space, which exists just as much as atoms, and is not merely 'place'.^j That is, it can enter into the composition of things. This too was taken from Leucippus and Democritus.^k

^a B1, A25, ch. 69 (Nessas)²^b A23, A22^c B1, cp. A25^d A25^e B1, 72A2^f A4^g A3, A2^h A6ⁱ A7^j A8^k 67A20

The other opinions attributed to him are all concerned with natural phenomena, the sun, the moon, the stars, thunder and lightning, clouds, the rainbow, winds, the sea, earthquakes. He thought that the fixed stars, like the moon, were lit up by the sun,^a and that the Milky Way was the mark of the sun's passage.^b Shooting stars were sparks caused by the collision of the clouds drawn up by the sun.^c Thunder and lightning are due to a collision between wind and a condensed cloud. The rainbow is the sun's light falling on a condensed cloud.^d Winds are watery anhalations due to the sun's heat.^e The sea is salt because it trickles through earth, and takes to itself part of the solid substance through which it passes, like something percolating through ashes.^f The earth is the sediment or 'dregs' of the original watery mixture, as the sun is of the air.^g Earthquakes are caused when the air enclosed in the caves under the earth is struck by air from above, he compares the phenomenon with the percussion set up when someone sings into a hollow jar, and says that a solid substance like earth cannot move of itself but must be moved from without.^h His comparison of the sun to a 'sediment' of the air can perhaps be elucidated from the rather obscure and uncertain passage attributing to him views like those of Heraclitus,ⁱ that the sun is constantly being quenched and ignited. Air condenses and causes cloud, and then water, and this descends upon the sun, quenching it; then the water is again rarefied and ignited. During the formation of the Cosmos, this process apparently went on until the fiery nature of the sun overcame the watery vapour round it, the stars being formed from portions of this 'bright water', that is, ignited clouds, but the process goes on to some extent, and the quenchings and ignitings, he thinks, cause night and day, and all eclipses.

^a A9, A12^e A18^b A13, A11^f A19^c A14, cp A4, A16^g A20^h A21^d A17ⁱ A4

71. DIOGENES OF SMYRNA

DIOGENES of SMYRNA lived in the fourth century B.C.

Nothing is known of Diogenes of Smyrna except that he was a pupil of Metrodorus,^a and taught Anaxarchus.^b His opinions are said to have been the same as those of Protagoras.^c As he was sometimes said to be of Cyrene, it may be that he migrated there from Smyrna

72 ANAXARCHUS

ANAXARCHUS of ABDERA was in his prime about 340 B.C., and was active throughout the reign of Alexander

Anaxarchus was said to have studied under Diogenes of Smyrna, the pupil of Metrodorus of Chios,^d it is odd that if he was a native of Abdera he should have to go abroad to learn Democritean doctrines. The date of his prime of life is given by Diogenes Laertius as the 110th Olympiad^e (340-37 B.C.), but he is known principally through his association with Alexander, whom he accompanied on his campaigns. He was said to have incurred the enmity of Nicocreon, tyrant of Cyprian Salamis, after the death of Alexander, Nicocreon, getting Anaxarchus into his power, put him to death by pounding him in a mortar, his defiant words to the tyrant were proverbial.^{f, f1} He was nicknamed *Eudaimonikos*, some said because of his serene temper,^g others, probably more correctly, because he gave Happiness as the goal of life.^h One of his pupils was Pyrrho of Elis, who accompanied him on his travels with Alexander, and met the Magi, and the Naked Philosophers of India, Pyrrho, however, afterwards severed his connection with his master because he came to disapprove of the latter's attendance on royalty. The chief lesson Pyrrho learnt from Anaxarchus was impassivity,ⁱ which he passed on to his own pupil Nausiphanes, the teacher of Epicurus.^j

^a 1, 69A1, 70A1 ^b 1, 69A2 ^c 2 ^d A1 ^e A1 ^f A1, A13
^g A1 ^h A14, B1, A9, A4 ⁱ A2 ^j 75A2

^{f1} πίπτει τὸν Ἀναξάρχου θύλακον, 'Ἀνάξαρχον δ' οὐ πτίσσεις 'You can crush not Anaxarchus but his husk. Θύλακος, the husk of a grain-seed, is also the word for the oriental 'trousers'.

He is classed with Zeno and Pyrrho as a sceptic,^a and with Monimus as one of those who did away with the criteria of knowledge, in that he likened reality to painting, and to the visions of sleep and madness.^b Almost all the stories told of him are concerned with his association with Alexander, but he also wrote a book *On Monarchy*, two quotations survive, but neither of them deals with the subject indicated by the title. Both quotations have a Democritean ring. The first takes Democritus' theory that things are neither good nor bad in themselves but must be correctly used if one is to gain advantage from them, and applies it to learning. much learning can help or harm him who has it, but all depends on knowing the right time, that is, when and in what company to utter it.^c The other says that it is hard to collect money, but harder still to keep it safe,^d and recalls Democritus' advice to fathers.^e

Opinions differed regarding his influence on Alexander. some said that he checked the King's arrogance, others that he pandered to it. He was accused by some of having taught Alexander that a king is above the law because he is the author of justice, when Alexander was suffering from remorse after his murder of Cleitus this soothed the King's mind, but harmed his character.^f This school of thought also accused Anaxarchus of encouraging Alexander to expect the obeisance from his subjects, while the Macedonians, with their spokesman Callisthenes, opposed it.^g Another story was that he encouraged Alexander to demand the heads of other satraps and rulers,^h whereas Alexander was always inclined to mercy. Others asserted that Anaxarchus derided Alexander's desire for divinity, pointing to his dependence on a dose of medicine when he was ill,ⁱ or to the 'blood, not ichor' that flowed from his wounds, but Plutarch said that the latter remark was Alexander's own.^j The technique of Anaxarchus, it was said, in handling Alexander was to mix sweet with bitter some blame, followed by praise.^k When he instructed Alexander in the Democritean theory of innumerable worlds, Alexander wept because he had not yet conquered this one.^l a variation on the familiar story.

There is a hint that Anaxarchus too, like other disciples of Democritus, was interested in Homer. Alexander's revised

^a A15^b A16^c B1^d B2^e 68B280^f A3, A5^g A6^h A4, A1 §58ⁱ A8^j A1 §60, A4^k A7^l A11

edition of Homer, which he carried with him and subsequently kept in a casket taken from the Persian treasury, was studied by him and annotated with the help of Callisthenes, Anaxarchus and their circles ^{a, a1}

It seems likely that after the death of Alexander, Anaxarchus settled in Cyprus. The story of his death by order of the revengeful tyrant may be true, though it has suspicious features. For instance, the favourite story of the philosopher who bites out his tongue and spits it at the tyrant is applied to Anaxarchus also ^b Clearchus of Soloi, one of Aristotle's pupils, in his *Lives* wrote of Anaxarchus (whom he may have known) as living in licentious luxury, with a beautiful naked girl to act as his cup-bearer, and a cook who wore sleeves and a mask to prevent his sweat and breath from contaminating the bread he was kneading ^c His love of comfort was contrasted with the austerity of Callisthenes ^d Timon, who wrote a lampoon on him, spoke of his bold and stubborn (or perhaps crazy) ¹ spirit, unabashed, ready to rush in any direction, knowledge made him miserable, but his nature, pleasure-smitten, drew him back ^e Timon spent some time at Elis as a pupil of Pyrrho, who had been for a while a follower of Anaxarchus, so that he may have heard of Anaxarchus from someone who knew him intimately but disapproved of him in some respects, nevertheless, the impression given by Timon does not accord with other accounts, in which Anaxarchus is credited with having taught Pyrrho imperturbability. It is likely that Anaxarchus' attachment to the court of Alexander made enemies for him among those who envied him his position, or who disapproved of a philosopher's associating with monarchs.

^a B12 ^b A1 §59, cp 29A1 §27 ^c A9 ^d A3 ^e A10

^{a1} This was the 'casket-copy', the work of Aristotle Plut *Alex* VIII

¹ ἐμμενές or ἐμμενές (probably the latter 'rash spirit, crazy to rush off in any direction with shameless violence')

73. HECATAEUS OF ABDERA

HECATAEUS of ABDERA lived at the end of the fourth and beginning of the third centuries B C (under Alexander and Ptolemy Lagos).

Hecataeus was said to have been originally a native of Teos, but to have migrated with others of his fellow-citizens to Abdera in order to escape the harshness of Persian rule,^a this must have been shortly before Alexander overthrew the Persian power in Asia Minor at the battle of the Granicus in 333 B C.

He was a pupil of Pyrrho,^b and gave self-sufficiency as the goal of life.^c He was credited with books *On the Hyperboreans* and *On the Philosophy of the Egyptians*. A work *On the Jews* attributed to him and quoted by Josephus, was regarded as a forgery even in antiquity.^d Diodorus, who also quoted from this book, was accused by Photius of giving a false account of Jewish laws and customs which he fathered upon 'Hecataeus of Miletus', doubtless Photius meant Hecataeus of Abdera, as the two were often confused.^e

His book *On the Hyperboreans* described an island 'not smaller than Sicily', lying in the northern ocean, 'off the Celtic land', and still inhabited in his day by a branch of the people called Hyperboreans. The island is fertile, with an excellent climate, and able to produce two crops a year. The moon, being only a short distance away, is clearly visible from it, and its mountains can be seen. The islanders are ruled by a hereditary aristocracy, the family of the Boreadae, who trace their descent from Boreas. They worship Apollo, who is said to visit the island every eighteen years, bringing fine weather, in which he himself revels, playing the harp and dancing all night long from the spring equinox to the rising of the Pleiads.^f The name of the island is Helixioia (Twisted Island), and it is said to be 'beyond the river Karambyka'; the islanders are named Karambykæ from the river.^g

The location of these places can hardly be discussed, as the

^a A2^b A3^c A4^d B16^e B13^f B5, B3^g B1

story of the Hyperboreans is almost entirely mythical,¹ going back to Hesiod and the Homeric Hymns. There is no reason to suppose that Hecataeus based his information on anything more tangible than travellers' tales, though he speaks of the Northern Ocean as called Amalchios, that is, 'frozen' in the language of the natives,^a and gives the names of the three branches of the Hyperborean people as though he had personal knowledge of them.^b But his preference for the marvellous is shown by Pliny's classing his book on the Hyperboreans with that of Amometus on the equally mythical Attacori of Central Asia, and by his mention of 'the city Cimmeris', which like Theopompus' Meropis and Plato's Atlantis was fabulous territory.^{c, c1}

His book *On the Philosophy of the Egyptians* was used by Diodorus in his account of Egyptian customs, it dealt with the whole theology of the Egyptians, the derivation of the world from Isis and Osiris, and the relationship of the deities to the heavenly bodies and the elements,^d with the Egyptian worship of animals, which Hecataeus described as a riddling way of speaking of their deities in the form of beetle, serpent and so on,^e with the titles of the deities, such as Ammon, which he says is a word used for summoning persons, and so used for calling upon their premier god,^f with the customs of the priesthood at Heliopolis, where wine is not allowed in the temple,^g with the greatness of Egyptian Thebes,^h and with the worship of Zeus at other centres.^h It is highly probable that Hecataeus like Diodorus used the work of Manetho, his contemporary, who was the first Egyptian to give in Greek an account of the doctrines and history of his country, based upon first hand knowledge

^a B2^b B4^c B1^d B7, B12^e B6, B13^f B8^g B11^h B13, B10^{c1} Cary and Warrington, *The Ancient Explorers*, p. 247, note 40

¹ Cary and Warrington, *The Ancient Explorers*, p. 198 'They (the Hyperboreans) were probably put at one time in Thrace, but were pushed farther north in legend as exploration failed to show them. Many like Herodotus knew that the whole story about them was a fable.' Pape, *Wörterbuch der Griechischen Eigennamen*, s.v. Καταβυκαί, suggests that the river is the Eider, and the island one of those off Jutland, but Pliny VI, 13, 14, places the river in Asia in the land of the Arimphaei, i.e. probably the Dvina, flowing into the White Sea

74. APOLLODORUS

APOLLODORUS OF CYZICUS: date unknown.

Apollodorus is said to have been a follower of Democritus, and to have given 'pleasure of the mind' as the goal ^a.¹¹ He was interested in the marvellous, and was said to have added to the list given in the *Manual Operations* (the magical treatise attributed to Democritus) the sensitive plant, *Mimosa asperata* ^b He declared that Democritus had associated with Philolaus the Pythagorean ^c

75 NAUSIPHANES

NAUSIPHANES OF TEOS lived in the time of Alexander, and after

Nausiphanes was a follower of Democritus.^d His actual teacher was Pyrrho ^e Later he set up a school in Teos, and practised Pyrrho's painstaking method of dealing with questions in detail, while working out a mode of expression of his own.^f He taught a combination of science and rhetoric, the former based not only on Leucippus and Democritus, but also on Anaxagoras and Empedocles, whose works he used to read aloud and expound ^g He was particularly interested in mathematics and logic He wrote a work on method, called *The Tripod*, in which he set forth the view that the men of science will also excel at the art of persuasion.

His chief interest lies in the fact that Epicurus for a time was a student of his,^h along with other 'dissolute lads', and singled Nausiphanes out for special obloquy in his tirades against all to whom he might be thought to have owed any of his doctrines ⁱ Epicurus called him the Jelly-fish because of his obtuseness ^j Other scornful epithets were 'pedagogue',¹ 'ignoramus', 'cheat', and 'prostitute', and there was a description of his 'travail to bring forth from his lips the professional bombast' only fit for slaves, and his displays of ecstasy which earned

^a 1 ^b 3 ^c 2 ^d A1 ^e A3, A2 ^f A2 ^g A7

^h A1, A2, A4 ⁱ A5, A8 ^j A7

¹ Ψυχωγία Clement gives the name as Apollodotus of Cyzicus, but it is generally assumed that Apollodorus is meant

¹ βιβλαριος used contemptuously, no other similar usage is known Possibly the word is corrupt

Epicurus' contempt.^a Epicurus also accused him of 'energetic hair-splitting' in his commentaries on Anaxagoras and Empedocles, and sums him up as 'a bad man, skilled in things by which one cannot attain to wisdom'.^b This is merely another example of Epicurus' repudiation of his predecessors, and as in the other cases, he owed something to the man whom he reviled. It was said that he derived his own book on method, the *Canon*, from Nausiphanes' *Tripod*.

The title of this book apparently referred to the three criteria of knowledge said by Diotimus to have been suggested by Democritus.^c A summary of part of the work was preserved by Philodemus in his *Rhetoric*: the theme is that the man of science has the capacity for rhetoric also, even if he does not practise it.^d The source of his power is his knowledge of the facts, so that he could pass on his own convictions not only to his pupils but to any race of people. Having a knowledge of the facts, he is able to lead his audience where he wishes, because he can tell them what is to their advantage, which is what they wish to hear. The scientist has command of the best diction also – not that created by vain imagination and convention, but that based on the nature of things.^e He also has command of logic, without which knowledge is impossible, and is best qualified to practise the art, indispensable to a statesman in a democracy or monarchy or any other constitution, of calculation of the future based on the known facts. The man who employs the continuous discourse will be best able to employ the dialectic method and vice versa,^f because both depend on an accurate judgement of how to lead pupils from the known to the unknown,^g that is, they depend upon a knowledge of the Democritean 'right time' and 'right measure' in speaking.^h

Nausiphanes gave as the goal of life a kind of 'imperturbability'.^{i, j} He was also among those who interpreted Democritus' theory of knowledge as meaning that among apparent existences nothing is more real than unreal. Nothing else seems to be known of his teaching.^k

^a A9 ^b A7 ^c 68A111, Ch 76, cp 68B1b, 68B2 ^d B1 ^e cp 68A57

^f cp Plato, *Protag* 334c, 335a ^g B2 ^h 68B225, 68B226 ⁱ B3

^j ἀκαταπληξία cp C Bailey, *The Greek Atomists and Epicurus*, p 218

^k C Bailey, *op cit*, several times (pp 129, 289, 311) suggests that it may have been Nausiphanes who introduced the notion that the atoms had weight, but this appears to be conjecture only.

76 DIOTIMUS

DIOTIMUS of TYRE, exact date unknown.

Diotimus of Tyre was a follower of Democritus.^{a, a1} He had little claim to originality, as far as can be seen from the few references to his views. He referred to Democritus' three criteria of knowledge, namely, for grasping the unknown, the known; for scientific inquiry, the mind, for choice and avoidance, the feelings.^b He also put forward the same views as Metrodorus and Straton.^c His term for the goal of life was 'complete attainment of what is good',^{d, d1} a definition of Democritus' Well-being.

He is probably not to be identified with the Stoic philosopher of the same name who forged fifty letters in support of a charge of profligacy against Epicurus.^{e, e1}

77. BION OF ABDERA

BION of ABDERA probably lived at the end of the fourth century B C.¹

Bion of Abdera was a follower of Democritus. He wrote in Attic as well as Ionic Greek. He was reputed to be a mathematician and astronomer. All that remains of his work is a classification of the four winds, in which he is bracketed with Aristotle and Timosthenes,^f and a statement that there were certain regions where during six months night reigned, and during the other six months, day.^g

78. BOLUS

BOLUS of MENDE lived in the third century B C.

Bolos was a native of Mende in the Nile Delta. He was called a Pythagorean, and possibly a Democritean also, by

^a 1 ^b 3, 68A111 ^c 1 ^d 2 ^e Diog. L. X, 3, cp. Athen. XIII, 611b
^f 2 ^g 1

^{a1} The reading Δημοκρίτειος is an emendation of Diels from the MS Διόκριτος, but that Diotimus was a follower of Democritus is established otherwise from the little that is known of his views.

^{d1} παντέλεια τῶν ἀγαθῶν

^{e1} See Smith, *Dict. Greek and Roman Biography and Mythology*, s. v. Diotimus, where the Stoic Diotimus is regarded as the author of the goal παντέλεια τῶν ἀγαθῶν.

¹ Pauly-Wissowa, Vol. III, p. 486

Suidas.^{a, a1} The list of his works includes two which were often ascribed to Democritus: *On Potent Natural Products*, a book on marvellous remedies, and *On Antipathetic and Sympathetic Substances*. Others were *On Marvels*, *On Stones according to their Elements* (a work of alchemistic tendency), *On Signs issuing from Sun, Moon, North Star and Rainbow* (probably on divination), and on *Aids to Research derived from Reading The Manual Operations*, ascribed to Democritus but now thought to be by Bolus, was a work dealing with operations of a marvellous kind, as opposed to the 'potent natural products', in which the magical cures are wrought by the power of the plant or other natural substance. Callimachus in his *Table of Democritus* and his *Vocabulary* listed Bolus as a forger of Democritean writings.

Extracts from Bolus are found in Pliny, and traces in other authors such as Plutarch and Aelian. Apollonius in his book of *Marvels* says that Bolus quoted Theophrastus *On Plants* regarding the plant wormwood (*absinthium*), which was alleged to act as a preventive against 'bile-disease' in the sheep of the Pontus, who ate it. Doubtless the bitterness of the plant was thought to counteract the bitterness associated with the disease.

A certain Ôros of Mende is mentioned in Aetius^b as the inventor of a 'remedy of nine ingredients'. This 'Oros' may be Bolus himself, or perhaps an associate or disciple. Bolus has no part in the history of philosophy or of scientific medicine, though his remedies were discussed by pharmacologists and physicians such as Xenocrates of Aphrodisias, Crateuas, Dioscorides and Galen, and passed into the works of Arabic writers such as Avicenna. It is also considered by some that the books on Husbandry attributed to Democritus were by Bolus, these were quoted by Columella, sometimes under the name of Democritus, sometimes under that of Bolus.¹

^a 68B300, 1

^b XV, 27

^{a1} In one place Suidas calls him Bolos-Demokritos, so that he may have borne the double name, perhaps because he published books under the name of Democritus. Diels emended 'Demokritos' to 'Demokriteios' (Vol. II, p. 212), on the strength of his being called Βῶλος ὁ Δημοκρίτειος by Apollonius. See pp. 323-329 above.

¹ See Pauly-Wissowa s.v. *Bolos*, and the works of Wellmann and Kroll cited by Diels *Vors.* ch. 78 (*Bolos*).

C. THE OLDER SOPHISTS

C. THE OLDER SOPHISTS

79 NAME AND CONCEPT

UNDER the heading of 'The Older Sophists' are grouped Protagoras, Gorgias, Prodicus, Thrasyarchus, Hippias, Antiphon, Critias. These men were active during the latter part of the fifth and early part of the fourth centuries B.C.

The name *sophistês* originally meant 'skilled craftsman', 'expert', it was used by Pindar^a of poets, by Aeschylus^b and Euripides^c of musicians, by Herodotus^d of seers, and by Plato^e of the Creator of the universe. It continued always to be used in this sense as well as in its later derived meaning, it is applied by Aelian, writing in the second century A.D., to 'those skilled in horsecraft' ^f.

Similarly it was used in a good sense to mean 'wise'. Herodotus^g called the Seven Sages *sophistai*, and in this he was followed by Aristotle,^h Demosthenesⁱ and Isocrates ^j. Herodotus^k also gave this title to Pythagoras, and Hippocrates^l applied it to the natural philosophers. Plato used it of the alleged 'wise men' of Crete and Sparta, in pretended respect.^m Again, this usage persisted. Arrianⁿ has it of the Brahmins, Dionysius of Halicarnassus^o has it of Isocrates and Plato.

As with *sophos*, so too with *sophistês*, the meaning 'clever, smart', was also found. Aeschylus uses *sophistês* several times thus in the *Prometheus*,^p when characters are made to speak sneeringly, for instance Kratos to Hephaestus, Hermes to Prometheus. So too Sophocles^q and Euripides ^r.

The specialized use of the word to mean 'professional teacher' came into use at the end of the fifth century, when the

^a *Isth* V, 28 ^b *Frg* 314 ^c *Rhes* 924 ^d II, 49 ^e *Republ* 596D
^f *N A* XIII, 9, cp. XI, 1 ^g I, 29 ^h *Frg* 5 ⁱ LXI, 50
^j XV, 235 ^k IV, 95 ^l *Vet Med* 20 ^m *Protag* 342B
ⁿ *Anab* VI, 16, 5 ^o *Comp* 25 ^p 62, 944
^q *Frg* 101, *Frg* 905 ^r *Hippol* 921

activities of the famous travelling teachers, Protagoras, Gorgias and the rest, became conspicuous. Xenophon's definition of them clearly shows why they were regarded with disapproval by many 'They call "sophists" those who offer wisdom for sale in return for money to all comers.'^a The chief source of disapproval was Socrates and all his admirers, especially Plato, and the objection to the Sophist was that he professed to teach 'wisdom', which cannot be taught, and accepted a fee for this. The case against the Sophists and all their works was powerfully developed by Plato; and it is to his influence primarily that the ill-repute into which the name and profession fell must be ascribed,^b for he brought out clearly the quarrel between rhetoric or the art of persuasion, which was their principal subject of instruction, and philosophy, which aimed at the discovery of truth by means of discussion based on sound method, and not at a verbal victory, and he constantly animadverted upon their commercial-mindedness, calling them 'paid hunters of the young and rich', and traffickers in learning.^c Xenophon declares that the name 'sophist' was considered disgraceful by right-minded men,^d and Plato makes a young man blush at the idea that he is preparing himself for the career of a Sophist.^e Demosthenes complains that Aeschines has called him 'sophist' as a term of abuse—a charlatan or clever rogue.^f Aristotle sums up the teaching of Socrates and Plato by defining the Sophist's art as 'the appearance of wisdom, not the reality', and the Sophist as one who makes money from this unreal appearance.^g

Nevertheless, the name retained some dignity, and was in use in Roman Imperial times as a professional title, it was frequently found in epitaphs, and was applied to professors of rhetoric and prose writers such as Aelian and Philostratus.^h

^a *Mem* I, 6, 13^b *Ch* 79, 1, 79, 2^c 79, 2 (Plato, *Soph* 231D)^d *Cyn* XIII, 8^e *Protag* 312A, cp *Meno* 90B 199^f XVIII, 276^g 79, 1 (*Soph El* 165a)^h See Liddell and Scott (Revised Edn 1940) *σοφιστής*, 3

80 PROTAGORAS

PROTAGORAS of ABDERA lived in the latter half of the fifth century B C

Protagoras was undoubtedly a native of Abdera, as Plato says,^a though a connection with Teos is also indicated^b

The date of his birth and death are disputed. Plato says that he died aged nearly seventy, having spent forty years in the exercise of his profession,^c and though his life was extended to ninety years^d by some authorities, Plato's testimony must be preferred. Apollodorus, who accepts Plato's statement that Protagoras died aged seventy, gives his prime of life as the 84th Olympiad,^e that is, 444-41 B C, the year 444 is doubtless intended, since there was a tradition that Protagoras had helped the Thurian colonists with their new constitution.^f If this be correct, then Protagoras was born about 484 B C and died in 414. But there is also a tradition that he was arraigned for impiety by one of the Four Hundred, and met his death soon afterwards,^g according to this, therefore, he died in 411 B C, was born in 481, and his prime of life is the last year of the 84th Olympiad, 441 B C

Another factor, however, must be taken into consideration, namely the date of the scene of Plato's dialogue *Protagoras*. In this dialogue Protagoras is made to speak of himself as elderly. He has spent many years at his profession, he says, and the sum of his years is considerable, he is old enough to be the father of any of those present. Now since the company includes the sons of Pericles, who died in 429 B C, it is generally thought that the scene of the dialogue is laid just before the outbreak of the Peloponnesian War, in about 432 B.C., and this fits what is said about the ages of the others present, Socrates, Alcibiades, Agathon. But if Protagoras was born in 484 or 481, this would make him only fifty-two or forty-nine at the time of the dialogue, which does not agree with his remarks about himself, at that age it would have been impossible or unlikely that he could have been the father of Socrates, then thirty-seven, or that he would so have described himself. The other possible dates for the scene of the

^a *Protag.* 309C

^b A1 §50

^c A8

^d A1 §55

^e A1 §56

^f A1 §50

^g A1 §54

dialogue (and therefore for Protagoras' second visit to Athens) are either between 423 and 421 B.C., as Athenaeus suggests, or in 419 B.C.^a Athenaeus gets his date from the fact that the *Flatterers* of Eupolis, showing Protagoras in town, was produced in 421 B.C., and he suggests that Plato is guilty of an anachronism in introducing the sons of Pericles, who had died eight years before. The date 419 B.C. is suggested by a remark of Plato himself in the dialogue, that the *Wild Men* of Pherecrates had been produced 'last year', this play was actually produced in 420 B.C. These later dates, 423-19 B.C., would better suit what Protagoras says of his own age: he would then be over sixty. But they would not do away with the interval between himself and Socrates, and would also throw out the ages of the rest of the party: for instance, Agathon, who is described as still a boy, in 432 B.C. he was about sixteen, but in 423, aged twenty-five, he would not be so regarded.

It seems best therefore to regard the *Protagoras* as set in about 432 B.C., and to accept the main features — the presence of Paralus and Xanthippus, the fact that Pericles is mentioned as still alive, the relative ages of the other characters — as genuine, and the allusion to the *Wild Men* of Pherecrates as an anachronism. Possibly Protagoras visited Athens a third time round 421 B.C., the visit referred to in *The Flatterers*, and this was the reason for Plato's mistake. But if 432 B.C. be the right date for this second visit, and if Protagoras could really speak of himself as old enough to be Socrates' father, he must have been born before 484 B.C., 490 would be nearer the correct date.

This date finds support in the story that Protagoras was educated by the Magi who were in attendance on Xerxes in 480 B.C.^b But if it is correct, then Protagoras cannot have been alive in 411 B.C. to be accused by one of the Four Hundred (that is, of course, if we accept Plato's statement that he died aged nearly seventy), and he cannot have been the pupil of Democritus, for Democritus was not born until about 460 B.C., and we are expressly told that Protagoras began his professional career at the age of thirty. In fact, the story of his relationship to Democritus must fall to the ground in any case, unless Protagoras was not born until about 470 B.C. at the earliest, and this contradicts all that Plato says of him.

^a A 11^b A 2 § 1

Life Two stories of his early life were current: one that his father was one of the wealthiest citizens of Abdera, who entertained Xerxes on his invasion of Greece, and obtained from the King the rare privilege of instruction for his son by the Magi who accompanied Xerxes.^a Philostratus, quoting the story, suggests that Protagoras borrowed his agnosticism from the Magi; nevertheless, there is not the slightest trace of their influence on his known work. The other story is that Protagoras spent the first part of his life as a labourer, a carrier of wood, and was rescued from this menial work by Democritus, who, struck by the orderly way in which he was binding some faggots, made him his secretary and trained him in letters and in philosophy.^b The source of this story was Epicurus, but as has been shown, it must be rejected on chronological grounds. Plato, commenting on the huge fortune made by Protagoras, does not hint at such lowly beginnings. It has been thought that the story arose because Protagoras invented the porter's shoulder-pad.^c

Nothing, therefore, is known of Protagoras' early years, nor of his relationship with Democritus and the other Abderite philosophers

At the age of thirty, he embarked on a professional career as a teacher. He travelled about Greece giving instruction for money, and is made to say in the *Protagoras* that he was the first to declare himself openly in this rôle.^d His fees were high,^{e, e1} but the pupil was not obliged to pay them if at the end of the course he did not think the instruction worth the money, he could instead take an oath before a priest and pay the sum of money he declared to have been deserved.^f Protagoras amassed a very large fortune during his forty years of teaching.^g

Of his travels, it is known that he visited Athens several times, the first time perhaps in or just before 444 B.C., when the colony to Thurii was setting out, the second time probably in about 432 B.C., just before the Peloponnesian War, the

^a A2 §1^b 68A9, 80A1 §53, A3, A4, B3^c A1 §53^d A5, A2 §4^e A1 §52, A3^f A6^g A8

^{e1} That he charged 100 minae, as Diogenes Laertius and Hesychius record, seems unlikely. Prodicus charged 50 drachmae for his advanced course on correct diction (84A11), and Hippias, who boasted that he had made more money than any two Sophists, including Protagoras, claimed to have made 150 minae altogether on a lecturing tour in Sicily, a sum which astonished his fellow-citizens (86A7, see below, p. 382). Taking the silver drachma as = about one dollar, 50 dr = £10, 100 minae = £2,000, 150 minae = £3,000.

occasion described in Plato's dialogue, and possibly a third time in about 422 or 421 B.C. Later, he also visited Sicily, where he was in great repute when Hippias was a young man,^a this may not of course have been his only visit. In Athens, he was received by Pericles, with whom he discussed legal questions,^b and he is said to have read his speeches to audiences in private houses and gymnasia, the house of Euripides is mentioned, and also the Lyceum.^c On his later visit or visits he stayed, together with other Sophists, at the house of the wealthy Callias.

There is a legend that the beginning of his book *On the Gods* offended religious sentiment at Athens, and that he was accused and condemned (either after a trial or by vote without trial) to banishment from all Athenian territory, while all copies of his book were called in and burnt in the market-place.^d The name of his accuser was given by some as Pythodorus, son of Polyzêlus, one of the Four Hundred,^e but Aristotle was said to have given another name, Euathlus, and Euathlus is said elsewhere to have been a pupil of Protagoras with whom he had a dispute over his fees.^f Others placed the burning of the books in 444-41 B.C.^g The legend proceeded to relate how Protagoras, expelled by the Athenians, fleeing from mainland to islands, and hunted by the Athenian triremes scattered over every sea, was drowned while sailing in a small yacht, bound, some said, for Sicily.^h The story, however, is completely contradicted by Plato's incontrovertible testimony that Protagoras 'died when nearly seventy, having spent forty years in the exercise of his profession, and in all that time down to the present day has never ceased to enjoy his high repute'. We know nothing of where Protagoras died, or how, but that his end was not violent, and that he was never attacked or punished by the Athenians, is certain. The dispute with Euathlus over fees may be genuine, and may have given rise to the whole story, this may also account for the defence put into Protagoras' mouth in Plato's dialogue, that pupils were allowed to pay what they stated on oath to be a fair return.ⁱ

Writings The most famous of Protagoras' theories, that 'Man is the measure of all things, of the things that are, that

^a A9 ^b A10 ^c A1 §54

^f A1 §56, A4, B6

^d A2 §3, A1 §52, A3, A12, A23

^g A4

^h A2 §3

^e A1 §54

ⁱ A6

they are, of the things that are not, that they are not', formed the opening sentence of his book entitled, according to Plato, *Truth*, according to Sextus, *Refutatory Arguments*.^a The opening phrase of his book *On the Gods*, which was said to have earned him expulsion from Athens, is also preserved: 'With regard to the gods, I cannot know whether they exist or do not exist, nor what they are like in form, for the factors preventing knowledge are many: the obscurity of the subject, and the shortness of human life.'^b Two sentences on education are preserved from a work entitled *The Great Argument*. A book *On Being* is also mentioned: Porphyry, who claimed to have read it and to have memorized passages, says that Plato borrowed its arguments.^c A similar accusation against Plato is made regarding a work of Protagoras entitled *Contradictory Arguments*: it was said that the beginning of the *Republic* was taken from it.^d Of a long list of other works given in Diogenes Laertius,^e one, *On Mathematics*, may be genuine. Aristotle in the *Metaphysics* mentions Protagoras' arguments against the geometers.^f The other titles probably refer to extracts from his other works, selected for discussion or mention by Plato, and do not represent separate treatises. *On Wrestling*, for instance, is derived from Plato's reference to Protagoras' views on wrestling and the other arts, mentioned in the *Sophist*.^g *On the Original Social Structure* doubtless is derived from the myth attributed to Protagoras in Plato's *Protagoras* (though of course this in its turn is probably taken or imitated from an actual passage in one of Protagoras' books). It was these Platonic parodies that probably gave rise to the accusation of plagiarism. Some of the titles of Diogenes Laertius, however, may refer to a collection of disputations on famous topics (*communes loci*) written as models to exhibit Protagoras' theories on rhetorical technique.^h *On Ambition*, *On Virtues*, *On the Errors of Mankind*, *On Constitution*, could all come under this head. So too could the *Trial concerning Fees*, which might be a model speech such as those later written by Antiphon; there is a hint that Protagoras, like Antiphon, was interested in the question of legal responsibility in cases of accidental death.ⁱ The title *The Art of Eristics* probably refers to one of the works on rhetoric, the *Contradictory Arguments*, which was said to be

^a B1^b B4^c B2
^g B8^d B5
^h B6^e A1 §54
ⁱ A10^f 998a (B7)

in two books.^a An exhortatory work^b may perhaps be identified with that on education, called elsewhere the *Great Argument*. He was also credited, like Democritus, with a work *On the Underworld*,^c but his agnostic views make this unlikely.

Teachings Protagoras himself claimed to be an educator of the young, according to Plato. The instruction he offered was not technical, like that of Hippias and others, to which he was opposed; it was practical, its aim being to fit the student for the conduct of his own affairs and those of the State.^d He believed that education should begin young, and that not only ability but intensive training was required.^{d, d1} education does not take root in the soul unless one goes deep.^e The civic virtues can be taught, and are taught by constant correction from childhood upward, the punishment inflicted by the laws has education, not revenge, as its object.^f Men all are endowed with the qualities which make life in a community possible — a sense of reverence and a sense of right — and it is to these that the educator appeals. If any lack these qualities, they are sub-human and must be put to death like pests,^g as Democritus also said.^h

The actual instruction by which Protagoras claimed to achieve these ends, however, included no special branch of knowledge, these were debarred by his theory of knowledge, which was summed up in the phrase 'Man is the measure of all things, of the things that are, that they are, of the things that are not, that they are not'.ⁱ This is generally taken to mean that each individual's perceptions are immediately true for him at any given moment, and that there is no means of deciding which of several opinions about the same thing is the true one, there is no such thing as 'truer', though there is such a thing as 'better'.^j He was led to this conclusion by observing that material objects are continuously changing, and that the person perceiving them also changes according to his own age, bodily condition and so on. All the appearances of matter are 'true', for they are all inherent in matter, but the person perceiving them seizes on that aspect which his condition

^a B₅^b A₁ §55^c A₅^d B₃, B₁₁, B₁₀^e B₁₁^f *Protag* 323E^g C₁^h 68B257, 68B258ⁱ B₁, A₁₃, A₁₄, A₁₅, A₁₆, A₁₉, A_{21a}^j A_{21a}^{d1} ἀσκησις, a word of which he appears to have been fond, cp *Protag* 323E

enables him to perceive, and on no other.^a If he is well, the wind feels warm to him, if ill, it feels cold; that is, it is warm to one, cold to another, and no question of 'truth' arises.^b This reduces all 'knowledge' to sensation, as Plato saw;^c and in fact does away with any possibility of stable knowledge of any kind.

The phrase was also taken to mean that objects do not exist except while someone is perceiving them; and this seems better to fit the actual words, 'Man' then being taken to mean 'Mankind', not 'individual man'. All things which appear to Man to exist, do exist, all things which appear to no man to exist, do not even exist.^d This theory also is discussed by Plato and Aristotle, and led the former to exclaim that he did not see why Protagoras made Man the criterion of existence rather than Pig or Baboon or any other creature with perception.^e There is no doubt that Protagoras held both these views, namely that things exist only while some human being is perceiving them, and that the percepts of all individuals are equally real.^f Are the two views incompatible? Not necessarily so, but the remarks of Sextus,^g that men take hold only of the aspects of matter which their condition enables them to seize, seem to show a contradiction in Protagoras' thought, for the aspects of a material object which are not being perceived by anyone cannot, on his own showing, exist, and in fact, as Aristotle remarks, his denial of the existence of percepts which are not being perceived means a denial of potentiality, as if one said that a man is not a builder except when he is actually building. This position, which Aristotle attributes to the Megarian school,^h he calls absurd.ⁱ

The assertion that all percepts are equally true led Protagoras to deny the Law of Contradictories, which rules that the same attribute cannot at the same time both belong and not belong to the same subject in the same respect. Protagoras asserted that there are two contradictory propositions on every matter,

^a A14^b B1, Aristotle, *Met* 1062b^c *Theaet* 151E sqq, B1^d A14, A16, A17^e B1 (*Theaet* 161C)^f A14^g A17

^h Yet in the *Protagoras* he is depicted as refusing to define 'the Good' as that which is useful to mankind, because there are things that are of no use to man (food, medicine, etc.) but useful to horses and other animals, so that he seems sometimes to have acknowledged that the percepts of animals have a right to recognition, in fact, that they sometimes conflict with ours is one of the reasons why the theory that all percepts are true was evolved, according to Aristotle (*Met* 1009b)

ⁱ Protagoras was credited with a work *On the Art of the Eristic School* (A1 §55)

and made this the subject of a treatise in two books ^a Aristotle in the *Metaphysics*,^b putting forward the Law of Contradiction as axiomatic, refutes Protagoras' view, saying that the axiom is in direct conflict with his theory that all opinions are equally true. He explains how this theory arose, and how it is equivalent to saying that the same thing both is and is not, its ground being the identification of reality with the sensible world. The refutation lies in recognizing that thought and knowledge are concerned, not with sensibles, but with their 'essence',^c which is their reality, and about which only one of two contradictory statements can be true. If all contradictory statements about the same thing were true, all things would be one and indistinguishable: a man is a ship, and not a ship, if anyone chooses to assert either proposition about him.^d Another favourite argument against Protagoras' view was the so-called 'recoil', which was said to have been used by Democritus, as well as by Plato, in refutation of Protagoras. If every opinion is true, then if the opinion that every opinion is not true occurs to anyone, the thesis falls to the ground.^e It is clear that although Aristotle sometimes writes as if Protagoras derived his theory of knowledge from Democritus,^f the latter's own views on knowledge are opposed to those of Protagoras.^g

His theory of knowledge, therefore, led him to disparage the sciences, the instruction which he gave was a study, not of truth, but of opinions, and of the means of influencing opinions, the art of persuasion, or rhetoric. He claimed that though all opinions were equally true, some were more desirable than others, more sound or healthy, the work of the teacher or orator is to instil into the individual or the State good opinions instead of bad,^h and his wisdom is that of the doctor or farmer. Health is not more 'real' than illness, yet it is better. This was Protagoras' claim at its highest, at its lowest it seemed to be concerned merely with the technique of persuasion, that is, how to make the weaker cause appear the stronger,ⁱ or how to argue that each of two contradictory statements are equally true or false.^j He set, therefore, a high value on the power of words,^j and gave his pupils a thorough grounding in all

^a B5; A1 §55^b 1005a-1011b^c A19 (*Met* 1007b), cp *Met* 1062b^d A15, A19^e *Met* 1009b12^f 68B156, 68B69^g A21a^h B6b, A21, C2ⁱ B6a, A1 §51, B12^j B12^l Plato's 186a, Aristotle's τὸ τί ἦν εἶναι

branches of oratory and the ancillary studies such as grammar,^a correctness of diction,^b and the analysis of poetry.^c He divided speech into several modes, some said, into four modes: prayer, question, answer, command, others said, into seven modes: narration, question, answer, command, report, prayer, invitation, which he said were the foundations of speech.^d He first defined certain 'divisions of time',^e this is taken by some to mean the tenses of the verb, but it more probably refers to the divisions of a speech, and is connected with his exposition of the importance of knowing 'the right time' to employ the devices of persuasion.^f He wrote rhetorical demonstrations on set themes, showing that two contradictory positions can be defended,^g these were eristic rather than logical, and as Aristotle says, though the attempt was plausible in appearance, its results were false, and its technique belonged to no science, but only to the arts of rhetoric and disputation,^h relying on verbal tricks, not on syllogistic proof or attention to real meaning.ⁱ Though in the *Protagoras* he is shown as one who claims to be able not only to make fine long speeches but also to give brief answers,^j he is also shown as failing notably when invited by Socrates to use the question-and-answer method.

His contributions to any particular branch of knowledge were, as might be expected, negligible. In psychology, he held that the soul did not exist apart from the perceptions,^k and that as such it resided in the breast, as Empedocles thought.^l In ethics, he held that the social virtues of reverence and justice were common to all human beings.^m His ideal of conduct was the Democritean imperturbability,ⁿ he commended Pericles for his behaviour on the death of his two sons.^o His views on the gods were purely agnostic: he did not say that there were no gods, but merely that he could not say whether they existed or not, or what they were like.^p

His attitude to mathematics, as to the other sciences, was hostile and contemptuous,^q in his attacks on geometers, he used to say that the tangent touched the circle not at a point but along a line.^r This remark seems to be part of his view that all appearances are valid: he merely appealed to the visible

^a A27, A28, C3 ^b A26, A24 ^c A25, A29, A30 ^d A1 §§53, 54, A29

^e A1 §52 ^f A1 §§3, B5, B6 ^g A21 ^h A1 §§52, 53 ⁱ A7

^j A1 §51 ^k A1 §51, 31B105 ^l C1 ^m B9

ⁿ B4, A23, A1 §52, A2 §2, A3, A4, A12 ^o A5 (*Protag.* 318D) ^p B7

^q His terms for this seem to have been εὔδη, ἀποστήλη, ἀνωδυνή

circle, and rejected the notion of circle as defined by the mathematician.¹ The remark is therefore of no interest to mathematics.

The theory of knowledge put forward by Protagoras helped Plato to formulate his own theory of a reality beyond perception. The dialogue *Protagoras* deals rather with Protagoras as teacher and orator, and gives a brilliantly satirical sketch of his personality, the myth,^a and the other speeches put into Protagoras' mouth are close imitations of his style, and probably of actual passages in his writings. The passage in the *Protagoras* in which a poem of Simonides is analysed^b is meant as a parody of Protagoras' method; the similar passage in the First Book of the *Republic*^c is probably likewise derived from Protagoras, and may account for some of the accusations of plagiarism against Plato.^d The theory of knowledge is examined in the *Theaetetus*,^e and touched upon in the *Cratylus*,^f the agnosticism regarding the gods is also mentioned in the *Theaetetus*.^g Plato frequently refers to Protagoras' educational and rhetorical theories, his denial of the Law of Contradictories,^h his insistence on correctness of dictionⁱ and the study of the poets,^j his large fees, his love of admiration, his fame. Gomperz^k maintained that the portraits of Protagoras in the *Protagoras* and *Theaetetus* were not consistent: that the former is intended as a historical portrait, the latter only as a *dramatis persona*, a mouthpiece of views that were Cyrenaic rather than Protagorean, since the dogmatism of the *Protagoras* ill accords with the phenomenism of the *Theaetetus*. But this is precisely Plato's complaint against Protagoras: that holding the view that truth cannot be discovered, he nevertheless took money for teaching, the greater his power to impress his hearers, therefore, the greater the harm he could do to the cause of philosophy. Both Plato and Aristotle took Protagoras seriously as a thinker, and went to the trouble of refuting his views at length.

Traces of his influence are found elsewhere, notably in the *Clouds*, where Aristophanes brings on to the stage the Stronger and Weaker Causes,^k and also satirizes grammatical instruc-

^a C1 ^b *Protag* 339A-347A ^c 331E 399 ^d B5 ^e 166D 399

^f 385E ^g 162D ^h *Euthydem* 286B ⁱ *Phaedr* 267C, *Crat* 391B, C

^j *Protag* 338E ^k C2

¹ See Ross, *Aristotle's Metaphysics*, note on 998a3 (Vol. I, p. 232)

² *Greek Thinkers*, I, pp. 457-399

tion.^a Euripides also may have felt his influence: a passage in the *Bacchae*^b is thought, from its terminology, to refer to Protagoras' religious agnosticism, and a passage in the *Suppliants*^c may echo his views on education.

81. XENIADES

XENIADES of CORINTH · date unknown.

Xeniades is mentioned by Sextus Empiricus only, who apparently derived his knowledge of him from Democritus. Xeniaades took up a position of complete nihilism: everything is false, both appearances and opinions; everything that comes into being does so out of Not-Being and is dissolved again into Not-Being.

Sextus twice compares his position with that of Xenophanes, but the latter said, not that all is false, but that we cannot know the truth for certain, even if we find it,^d thereby implying that truth exists, whereas Xeniaades' position seems to be taken up in an effort to reach the extreme of scepticism, and is of course self-destructive.

82. GORGIAS

GORGIAS of LEONTINI was active during the latter half of the fifth century B.C.

Gorgias was a native of Leontini, his father's name was Charmantides.^e The date of his birth was not known, but he was no longer young when he came to Athens in 427 B.C. on an embassy from his native city.^f Plato represents him as still active in 399 B.C.^g Other dates are mentioned in connection with him: he was 'placed' by Porphyry in the 80th Olympiad (460-57 B.C.) according to Suidas, who adds, 'but he must be considered older than this',^h showing that he took it as the date of birth; it may, however, be meant as the date of Gorgias'

^a C3^b 199 sqq (C4)^c A2, A7^d A1 §1^e 913 sqq^f A8a^g 21B14, 21B15^h A2

prime of life, making the date of his birth 500 B.C., this would make him seventy-three years of age when he visited Athens on the embassy. He is said to have published his treatise *On Nature* in the 84th Olympiad^a (444-41 B.C.), but this date is always suspect, 444 B.C. being that of the founding of Thurii, and a favourite year with chronologists. Gorgias' statue was said to have been set up in gold at Delphi in about 420 B.C.^b Plato implies that he was active in 399 B.C., for he makes Socrates mention him in the *Apology* as a living teacher, as well as Hippias and Prodicus.^c Pausanias suggests that he was still able to rival younger men at an even later date: he mentions a competition between Gorgias and the rhetorician Polycrates, in which the former was successful, and so supplanted the latter in the favour of the tyrant Jason of Pherae^d (who reigned from about 380 to 370 B.C.). Tradition credits Gorgias with a very long life: he is said to have lived to be over a hundred years old — some said, one hundred and nine — in full possession of his faculties.^e Isocrates, who was Gorgias' pupil, corroborates the belief that he lived longer than any of the other Sophists.^f It therefore seems likely that he was born soon after 480 B.C., and lived well into the fourth century. This accords with the testimony in the Plutarchian *Lives of the Orators* that Gorgias was a little younger than Antiphon, who was born during the Second Persian War^g (in 480 B.C.).

Little is known of his early education. He is said to have been a pupil of Empedocles,^h whose scientific theories he subsequently taught,ⁱ and whom he saw 'practising magic'.^j Gorgias' brother Herodicus was a well-known physician,^k so that it seems likely that they studied medicine and physical science together under Empedocles or one of his pupils. Gorgias must have been prominent in his own city to have been entrusted with the leadership of the embassy to Athens in 427 B.C.,^l but his great reputation in Greece Proper seems to have dated from his success when on that embassy.

His speech on that occasion astonished the Athenian Ecclesia by its unfamiliar style,^m his success was not only with the mob, but with the leaders, intellectual and political.ⁿ He was opposed by the venerable Teisias, who spoke for Syracuse,

^a A10 ^b A7, A8 ^c A8a ^d A7 ^e A1 §6, A2, A7, A10, A12, A13
^f A18 ^g A6 ^h A2, A3, A10 ⁱ B4 ^j A3 ^k A2, A2a
^l A4 ^m A4 ⁿ A1 §3

but the latter, the author of one of the first text-books of rhetoric, was no match for Gorgias.^a The alliance with Leontini was accepted by Athens at the price of enmity with Syracuse; and thereafter Gorgias was in great demand both as a public speaker and as a teacher of rhetoric.

Though he visited Athens and displayed his gifts there, his time seems to have been passed chiefly in Thessaly,^b especially at Larissa, where the ruling family of the Aleuadae were patrons of culture.^{c, c1} But he never settled down in any one city, preferring to be free from all ties, public and private.^d The Thessalians were wealthy, since the national industry of horse-breeding was very profitable, and they were prepared to pay the high fees Gorgias demanded. Among his Thessalian pupils, Plato mentions Aristippus and his friend Meno.^e Aristippus, one of the Aleuadae (not to be confused with Aristippus of Cyrene, the disciple of Socrates), was famed for his horsemanship,^f he was a great friend of Cyrus the Younger, and obtained from him a force of four thousand men and six months' pay for these, in order to crush a revolt in Thessaly.^g When the time came for his expedition, Cyrus obtained from Aristippus the use of this mercenary army, and the leadership was given by Aristippus to Meno.

Meno, the character of Plato's dialogue *Meno*, also appears in Xenophon's *Anabasis*. He accompanied Cyrus' expedition, but after the battle of Cunaxa he behaved treacherously towards the Greeks. Xenophon^h paints him as a complete scoundrel, and regards his miserable end as well deserved: he was completely lacking in principle, an adept at deceit and perjury. Plato's portrait contains no such traits, the faults he implies in Meno are trivial, and he thought it worth while to make Socrates discuss Virtue with him.ⁱ Meno in Plato's dialogue professes the greatest admiration for Gorgias as a teacher of rhetoric who made no claim to teach virtue.^j

Another pupil of Gorgias was Proxenus the Boeotian, the

^a A7 ^b A18 ^c A19 ^d A18 ^e A19 ^f Athen XII, 534B

^g Xen *Anab* I, 1, 10 ^h Xen *Anab* II, vi, 21 sqq, cp Diod XIV, 19, 27

ⁱ A21

^{c1} It was they who gave Pindar his first commission *Pyth* X, for Hippocleas (or Hippocles) of Larissa, in 502 B.C. Plato, *Meno* 70A, B, (A19), implies that their reputation for culture was recent: πρὸ τοῦ μὲν ἐφ' ἡπικτηθεῖ τε καὶ πλοῦτῳ, νῦν δὲ . . . καὶ ἐπὶ σοφίᾳ

^j The inconsistency has often been discussed. See Thompson, *Meno*, Introduction, pp xv-xx

friend of Xenophon, who accompanied Cyrus' expedition and was one of Tissaphernes' victims. It was his ambition to shine in public life that made him engage Gorgias as his teacher.^a He proceeded straight from these studies to his military command. He was a man of complete integrity, the very opposite of Meno, according to Xenophon, but he lacked the strength of character to command any but men of good character.^b

The greatest of Gorgias' Athenian pupils was Isocrates,^c who owed to him many of his stylistic devices, it was said that the figure of Gorgias looking at an astronomical globe was sculptured on Isocrates' tombstone.^d Gorgias knew Socrates,^e and was admired by Thucydides,^f Pericles and Aspasia, Critias and Alcibiades, Pericles, Critias and Thucydides all owed something of their style to him. Agathon the dramatist imitated Gorgias' diction in his iambs^g,^h as well as in his rhetorical style, of which Plato gives a parody in the *Symposium*. Agathon's speech reminds Socrates so much of Gorgias that he fears a 'Gorgias-head' will appear and petrify him into silence.ⁱ Socrates himself is portrayed by Xenophon as mimicking Gorgias.^j Of Socrates' disciples, Aeschines the elder is said to have imitated Gorgias in the beginning of a speech perhaps intended for a Thessalian audience,^k and Apollodorus of Phaleron is depicted in Plato's *Symposium* as making a pun in the Gorgian manner.^l Pupils from other cities included Polus of Acragas,^m the respondent of Plato's dialogue *Gorgias*, who is ridiculed also in the *Phaedrus*ⁿ for using certain technical terms for figures of speech; and Alcidas of Elaea,^o whose pompous style and excessive use of poetical diction is criticized by Aristotle,^p and whose *Essay on Death* was admired by Cicero.^q Alcidas is said to have taken over Gorgias' school,^r presumably at Athens, where he (Alcidas) was in residence from 432 to 411 B.C.

But Gorgias' success aroused envy also, he was attacked by

^a A5 ^b Xen *Anab* II, vi, 17 sqq ^c A12, A16, A32 ^d A17

^e Plat *Meno* 71C, and *Gorgias* ^f 84A9 ^g A1 §3, A35 ^h C1

ⁱ C2 ^j A35 ^k C1 ^l A2 ^m 267B (80A26) ⁿ A2

^o *Rhet* III, 3, 8, cp Dion Hal *de Isao* 19 ^p *Tusc* I, 48 ^q A2

^r Imitation of Gorgias' style brought a new verb into the language γοργιάζειν, Philostr *V S* I, 9, 3. Philostratus says that in Thessaly it was equivalent to ἀητορεύειν *Ep* 73 (A15).

¹ On Thargelia, the famous beauty of Miletus, one of whose fourteen husbands was Antiochus, King of All Thessaly (86B4). See below, p. 384.

Socrates' friend Chaerephon with his customary vehemence,^a but apparently came off best in the encounter.^b Antisthenes, who before he came under the influence of Socrates had studied under Gorgias, wrote an attack on the latter called *Archelaus*.^c Aristophanes lampooned Gorgias and a pupil called Philip (otherwise unknown) in *The Farmers* (425 B.C.), *The Wasps* (422 B.C.) and *The Birds* (414 B.C.)^d There was a professional hostility between Gorgias and Prodicus of Ceos.^e An accusation was current that Gorgias among others plagiarized from the historian Melesagoras (or Amelesagoras) of Chalcedon,^f probably this was derived from Thrasymachus, a rival of Gorgias and native of Chalcedon.^g Gorgias is said to have read Plato's *Gorgias* aloud to his friends, and to have remarked, 'What a clever satirist Plato is!'^{h, i}

His public appearances included a demonstration in the Athenian theatre, when he invited the audience to 'attack' him with any questions they wished, his courage evoked great admiration.^j He was invited to Delphi to give an oratorical display, and speaking from the altar aroused such enthusiasm that his statue was set up in the temple in gold,^k this was in about 420 B.C. Apparently he himself paid for the statue out of his gains, Cicero remarks that it was solid gold, not gold-plated.^l He was also invited to Olympia, where he delivered an address on Hellenic unity.^m At Athens he was invited on one occasion to deliver the funeral oration on those killed in the war, a great honour for a non-Athenian.

Gorgias remained unmarried. A story is told by Plutarch regarding his funeral oration, that Melanthius the tragic poet, after hearing it, said 'He advises us on unity, but cannot preserve unity between himself, his wife and his maid.'ⁿ But the testimony of Isocrates must take precedence, namely that Gorgias never married or had children, thus avoiding a heavy and continuous charge on his income.^o He is said to have charged the highest fees,^{p, q} and he too made vast sums of money

^a Plat *Apol* 20E sqq

^b Az4, cp Plat *Gorg* 447A sqq

^c A33

^d A5a

^e A24, 80A26

^f A33

^g A30, A32, B14, 85A12

^h A15a

ⁱ A1a

^j A1 §4

^k A7, A8

^l A1 §4, A7

^m B8a

ⁿ A18

^o A2, A4 §2, 80A5

^{h, i} W. H. Thompson, *Gorgias*, Introd. p. xvi, suggests that this applies rather to the second portion, the portrait of Polus, than to that of Gorgias. But the point of the story is Gorgias' equable temper and generosity to a critic.

^q 100 minae is the figure mentioned, as for Protagoras, but this is unlikely. See above, p. 345, note

— more, Isocrates says, than anyone he remembers; but in spite of this, and in spite of his freedom from commitments, he left only a comparatively small fortune ^a After a long life of travel and professional activity, and an old age free from the usual disabilities, he died aged over a hundred years His statue was erected at Olympia by his great-nephew Eumolpus, the grandson of his sister ^b this is another proof that he left no direct descendants. The inscription belonging to this statue was discovered at Olympia in 1876, and shows that Eumolpus had been one of Gorgias' pupils, it adds to the dedication a defence of Gorgias for having put up his own statue at Delphi, saying that the statue was the reward of virtue, not a display of wealth. ^c

Writings Gorgias is credited with one of the earliest textbooks of Rhetoric, ^d this seems to have owed something to Teisias ^e The Handbook, however, does not seem to have contained a scientific exposition of the rules of the art, Aristotle complains that all those who professed to give a rhetorical education taught not by rules but by making their pupils memorize speeches ^f Dionysius says that Gorgias nowhere explains the rules of 'right time', any more than the rest of the writers on rhetoric he first attempted the subject, but said little worth mentioning ^g The book, like that of Teisias, dealt with the important subject of Probability, ^h and doubtless contained various practical hints for dealing with opponents ⁱ

He also wrote a treatise *On Being*, or *On Nature*, a long extract from which is preserved by Sextus ^j This is sometimes said to have been an early work, published around 444 B.C. ^k It is Gorgias' sole claim to be considered a philosopher. His epideictic speeches included the Pythian oration, of which nothing is preserved, ^l the Olympian oration, from which a few sentences survive, ^m and the main theme of which is described by Philostratus, ⁿ the Athenian Funeral Oration, also described by Philostratus, ^o of which a short continuous passage survives, ^p as well as a few isolated phrases, ^q and possibly the *Encomium to the Eleans*, ^r which seems to have been written for public delivery, doubtless at Olympia. There survive also large frag-

^a A18 ^b A7 ^c A8 ^d A3, B14 ^e 80A26 ^f B14
^g B13 ^h 80A26 ⁱ B12 ^j B3 ^k B2 ^l B9 ^m B7, B8, B8a
ⁿ A1 §41 ^o A1 §5 ^p B6 ^q B5a, B5b ^r B10

ments of two of his speeches written as exercises, probably as models for pupils, the *Encomium on Helen*^a and the *Defence of Palamedes*.^b Dionysius of Halicarnassus, writing in the first century B.C., says that he has come across no forensic speeches of Gorgias, and only a few political speeches and exercises, the the majority being epideictic.^c

The essay On Being The long extract^d from the essay *On Being* (or *On Nature*) is Gorgias' only known incursion into philosophy. The divisions of the argument are as follows

- I. Nothing exists
 - a* Not-Being does not exist
 - b* Being does not exist.
 - i as everlasting.
 - ii as created.
 - iii as both
 - iv as One
 - v as Many
 - c*. A mixture of Being and Not-Being does not exist.
- II If anything exists, it is incomprehensible.
- III If it is comprehensible, it is incommunicable.

I Under the first heading, that Nothing Exists, he argues as follows if anything exists, it must be either Being or Not-Being, or both Being and Not-Being, then he disproves these three propositions in turn, in the Eleatic manner

a It cannot be Not-Being, for Not-Being does not exist, if it did, it would be at the same time Being and Not-Being, which is impossible

b It cannot be Being, for Being does not exist Under this subdivision is another triple subdivision if Being exists, it must be either everlasting, or created, or both; and he disproves these three propositions

i It cannot be everlasting, if it were, it would have no beginning, and therefore would be boundless, if it is boundless, then it has no position, for if it had position it would be contained in something, and so would be no longer boundless, for that which contains is greater than that which is contained, and nothing is greater than the boundless It cannot be contained by itself, for then the thing containing and the thing

^a B 11^b B 11a^c B 6^d B 3

contained would be the same, and Being would become two things—both position and body—which is absurd. Hence if Being is everlasting, it is boundless, if boundless, it has no position ('is nowhere'), if without position, it does not exist.

ii. Similarly, Being cannot be created; if it were, it must come from something, either Being or Not-Being, both of which are impossible.

iii. Similarly, Being cannot be both everlasting and created, since they are opposite. Therefore Being does not exist.

He adds the further proof that if Being existed it would have to be either One or Many.

iv. It cannot be One, because if it exists it has size, and is therefore infinitely divisible, at least it is three-fold, having length, breadth and depth

v. It cannot be Many, because the Many is made up of an addition of Ones, so that since the One does not exist, the Many do not exist either

c Lastly, a mixture of Being and Not-Being is impossible. Therefore since Being does not exist, nothing exists, and the first proposition is proved

II The second proposition, that if anything exists it cannot be comprehended by Man, is dealt with in a different way. He states that if the concepts of the mind are not realities, reality cannot be thought: if the thing thought is white, then white is thought about, if the thing thought is non-existent, then non-existence is thought about, this is equivalent to saying that 'existence, reality, is not thought about, cannot be thought'. Many things thought about are not realities: we can conceive of a chariot running on the sea, or a winged man. Also, since things seen are the objects of sight, and things heard are the objects of hearing, and we accept as real things seen without their also being heard, and vice versa, so we would have to accept things thought without their being seen or heard, but this would mean believing in things like the chariot racing on the sea. Therefore reality is not the object of thought, and cannot be comprehended by it. Pure mind, as opposed to sense-perception, or even as an equally valid criterion, is a myth.

III. The third proposition is that if anything is comprehensible, it is incommunicable. The things which exist are perceptibles, the objects of sight are apprehended by sight, the

objects of hearing by hearing, and there is no interchange; so that these sense-perceptions cannot communicate with one another. Further, that with which we communicate is speech, and speech is not the same thing as the things which exist, the perceptibles, so that we communicate not the things which exist, but only speech, just as that which is seen cannot become that which is heard, so our speech cannot be equated with that which exists, since it is outside us. Further, speech is composed from the percepts which we receive from without, that is, from perceptibles, so that it is not speech which communicates perceptibles, but perceptibles which create speech. Further, speech can never exactly represent perceptibles, since it is different from them, and perceptibles are apprehended each by the one kind of organ, speech by another. Hence, since the objects of sight cannot be presented to any organ but sight, and the different sense-organs cannot give their information to one another, similarly speech cannot give any information about perceptibles. Therefore if anything exists and is comprehended, it is incommunicable.

An epitome and criticism of this thesis was also given by the Peripatetic writer of the treatise *On Melissus, Xenophanes and Gorgias*. Whether it was meant as a serious contribution to philosophy, or whether it was a rhetorical exercise, in the Eleatic manner, may be doubted. Some¹ have thought that it had a serious purpose: that it was modelled on Zeno's defence of Parmenides, and was an attack on the Eleatics by means of their own weapons, in defence of Gorgias' teacher Empedocles. It seems doubtful, however, whether Gorgias was concerned to defend anybody. Zeno took the proposition of the opponents of Parmenides, that the Many exists, and showed that contradictory conclusions follow, but Gorgias' thesis does not pursue the analogous method, which would have been to take the proposition that the One only exists, show the contradictory conclusions that follow, and so support Empedocles' pluralism.² He undertakes to prove not only that Being does not exist, but also that Not-Being does not exist, and his demonstration that the senses cannot intercommunicate is anti-Empedoclean, for Empedocles said that the senses should be used as a check on

¹ E.g. Gomperz, *Greek Thinkers*, Vol. I, pp. 487 sqq.

² Cp. *Enc. Hel.* 21 ἐβουλήθη γράψαι τὸν λόγον. Ελένης μὲν ἐγκωμιον, ἑμὸν δὲ παίγιον.

one another.^a Gorgias appears rather to be making away with every hypothesis that could suggest itself to a philosopher; and it is possible that in writing this treatise he had no more serious purpose than in writing his other exercises, namely to show that he could write in any style he chose. It is notable that Plato nowhere refers to Gorgias' nihilist views, though he devoted serious attention to those of Protagoras, he treats Gorgias throughout as a rhetorician, not as a philosopher. Aristotle, however, took Gorgias' views more seriously, and wrote a monograph (not extant) against them,^b and it was by the Peripatetic school that the treatise *On Being* was preserved. Isocrates mentions Gorgias as having the hardihood to declare that nothing exists, as opposed to the Eleatics, Parmenides and Melissus.^c

Sextus speaks of the essay *On Being* and *On Nature* as one, but it is possible that the latter was a separate work on physical science. If so, it may have been here that Gorgias expressed the views, derived from Empedocles, on colour, which Plato mentions in the *Meno*.^d

Other works The Olympian oration, as Philostratus says, dealt with the greatest of political themes. Gorgias preached the unity of Hellas, and the need for a concerted attack on the barbarians, that is, Persia. The prizes of war were to be, not each other's cities, but the territory of the barbarians.^e The speech began with praise of the organizers of the festival.^f In support of the argument he declared that the projected struggle required two virtues, courage and wisdom: courage to resist danger, wisdom to 'read the riddle'.^{g, g1} The Funeral Oration at Athens, however, contained nothing about Hellenic unity, since he was speaking to Athenians, who desired empire, but it stressed their past glories in the victories of the Persian Wars.^h A passage in praise of the dead is preserved, it is full of Gorgian antitheses.ⁱ The influence of Gorgias' panhellenism on Isocrates is obvious.

The genuineness of the *Encomium on Helen* was at one time

^a J1B4

^b Diog. L. V, 25, B1

^c B1

^d B4

^e A1 §4

^f B7

^g B8

^h A1 §5, B5b

ⁱ B6

^{g1} Clem. *Strom.* I, 51. MS αἰνίγμα. Diels emend. πλῆγμα 'to recognize the right way to tackle the situation'. In 85A4, which he quotes for comparison, καταπλήγησι is also an emendation (Aristoph. *Frg.* 198, see Oxford Text ed. Hall and Geldart), though the noun and verb are found elsewhere. Liddell and Scott (1940 edn.) s.v. καταπλήσσομαι and πλῆγμα.

doubted because of the existence of Isocrates' exercise on the same theme,^a in which both Gorgias and Protagoras are mentioned,^b it is now generally accepted as the work of Gorgias. An attempt has been made to date it by comparison with the *Troades* and *Helen* of Euripides: one writer^c has placed it between the two plays, in 414 B.C., others^d consider that it precedes the *Troades* also, so that no certain date has been arrived at. The *Encomium* is, as Isocrates says, a defence, not a eulogy.^e It contains an encomium on Speech as the strongest means of compulsion — by persuasion — 'which achieves the most divine results by means of the smallest and least visible substance',^f as if speech were a very subtle material force passing from the persuader to the persuaded, something like Empedocles' Love and Hate. The importance of praising and censuring the right things is emphasized.^g

The *Defence of Palamedes* is more in the style of a forensic oration, it has striking resemblances to Plato's *Apology*, for example, the warning to the imaginary jury that they will bring dishonour on themselves by condemning an innocent man.^h The panhellenic point of view is prominent throughout; and there is a portrait of Palamedes as the well-disposed citizen.ⁱ The loss of 'credit' is said to be greater than the loss of money or country.^j An imitation of the phraseology of the Law of Contradiction appears, showing that Gorgias was interested in the logical studies of the day.^{k, l}

None of his political speeches survives. A reference to Cimon^m may have occurred in the Funeral Oration, being probably part of the eulogy of the Athenian glory in the Persian Wars. No forensic speeches were known, but the *Helen* and the *Palamedes*, especially the latter, were forensic in tone, and we hear of a pupil called Philip who was defeated in the Athenian jury-court.ⁿ Gorgias appears, however, to have had a low opinion of forensic oratory, comparing the speakers to frogs because they 'talk to the water-clock'.^o

^a Or. X ^b Ib §3 ^c X §14 ^d B11 §8, A26 ^e B11 §1, cp 68B192

^f B11a §36, cp *Apol* 30C ^g B11a §31 ^h B11a §21 ⁱ B11a §25

^j B20 ^k A5a ^l B30

^m καίτοι πῶς χρὴ ἀνδρὶ τοιοῦτω πιστεῦειν, ὅστις τὸν αὐτὸν λόγον λέγων πρὸς τοὺς αὐτοὺς ἀνδρας περὶ τῶν αὐτῶν τὰ ἐναντιώτατα λέγει, cp Plato, *Republ* 436E, where the Law of Contradiction is stated

ⁿ Preuss, *de Eur Hel*, Leipzig, 1911

^o E.g. Pohlenz, *Nachr. d. Gott. Ges. d. W.*, 1920, p. 166

Gorgias' chief interest was in epideictic oratory he was regarded by many as the father of this art, just as Aeschylus was the father of tragedy, that is, although he had predecessors such as Corax and Teisias of Syracuse, and others still earlier, his many contributions to the rhetorical technique entitled him to be regarded as its real founder,^a or at least as one who resuscitated it when it had been neglected and forgotten in Greece Proper.^b He himself had a great gift of impromptu oratory,^c as well as an original style and poetical vocabulary,^d he believed that he could teach much of this art to others.^e His own gift included a readiness of wit which emboldened him to offer himself to the crowd for questioning,^f he claimed to be able to answer any question.^g This power also, namely the ability to answer questions with confidence and dignity, he professed to be able to teach.^h But in his view, the great importance of Rhetoric lay in its power to persuade: it was the 'artificer of persuasion',ⁱ and its whole authority was exercised by means of words.^j Words are its only concern, persuasion is its only goal.^k The orator can speak best on all subjects.^k He will of course generally use his power for good, as when Gorgias, visiting the sick in company with his brother and other doctors, often succeeded, where they had failed, in persuading the patient to submit to a painful operation.^l But the orator can 'make big look small and small big' by the power of speech,^m and it is his function to be able to glorify something by praise and attack it again by vituperation.ⁿ This art was to be learnt by practice, and Gorgias composed his eulogies and denunciations as examples for the guidance of his pupils.^{o, o1} He claimed, like Protagoras, to be able to say a thing in the fewest possible words, and also to be able to talk at any length,^p this drew on him the censure of Prodicus, who said that there was only one length for a speech — the right one.^q

A large number of technical terms are given for figures of speech which he introduced or popularized. One of his rules was 'the grand manner for the grand theme',^r this to him meant poetical diction and a style ornamented with constant antitheses, assonance, analogy, apostrophe, allegory, hypallage, exact

^a A1 §1, A4^b A7^c A1 §3, A12^d A29^e A21^f A12^g A19, A20^h A19ⁱ A28^j A27^k A26^l A22^m 80A26ⁿ A25^o A25^p A20^q 80A26^r A1 §2^{o1} *Communes loci* See above, p. 147

verbal balance of clauses,¹ similar endings, repetition, metaphor, puns.^a His technique was intended to shock and surprise; hence the importance of approach, 'attack', paradox, employment of detached phrases, transposition.^{b, b¹} His diction was at times not far removed from dithyramb. He also taught breathing, and the declamation of a whole sentence in a single breath.^{c, c¹}

These novel tactics astonished the Athenians, accustomed as they were to the more austere style of Attic oratory. At first his gifts won him success and boundless admiration, and he influenced all, from highest to lowest. Gradually, however, as their novelty wore off, his tricks of speech came to be regarded as tiresome and absurd (Diodorus),^d vulgar and overloaded (Dionysius),^d appealing only to the uneducated (Aristotle),^e or to boys (Dionysius, Athanasius).^f His metaphors in particular came to be ridiculed. In his Funeral Oration he had called vultures 'living tombs', and referred to Xerxes as 'the Persian Zeus'.^g He addressed a swallow as 'shocking Philomel'.^h He described public affairs as 'pallid, tremulous and anaemic'.ⁱ His unusual compounds were censured by Aristotle,^j though the latter sometimes implies that his methods were effective — his direct openings,^k and his manner of varying the eulogistic passages of his epideictic orations.^l His chief fault was his lack of restraint in the use of all these figures of speech,^m he had no sense of what was fitting to the occasion.ⁿ This is exemplified in all the extant remains of his compositions, especially in the Athenian Funeral Oration.^o

His method of teaching rhetoric by making pupils memorize speeches was censured by Aristotle as speedy but unscientific. It was as if a teacher of shoemaking gave the pupil a large number of shoes instead of instructing him in the technique.^p Aristotle preserves a useful hint given by Gorgias on how to control audiences: 'The seriousness of one's opponents must be quelled by laughter, their laughter by seriousness'.^q Plato's complaint against him, as against the other orators, that they

^a A2, A3, A19, A30, A31, A32, A35, B5a, B6, C1, 84A9 ^b A1 §2, A2, A35

^c A1 §2 ^d A4 ^e A29 ^f A32, B5a ^g B5a ^h A23 ⁱ B16

^j A15 ^k B10 ^l B17 ^m A32 ⁿ B5a, B6 ^o B6 ^p B14 ^q B12

^{b¹} προσβολή, ὀργή, παραδοξολογία, ἀπόστασις, υπέρβασις

^{c¹} Liddell and Scott (1940) ¹ πνεῦμα

¹ Balance of clauses παρίστωσις (παρίστα), cp ἰσοκῶλα (A2, A4), one of his favourite devices. The pun is called ἰσα λέγειν in *Symposium* 185C

cared nothing for truth but only for appearance, and that they had no real subject to teach, is expressed in the *Gorgias*, where Rhetoric is called an art of flattery, akin to cookery, when the cook has no knowledge of the value of food, but cares only to serve it up in a form pleasing to the appetite.^a As in the *Protagoras*, the *Gorgias* contains many parodies of the style of Gorgias and his pupils.¹ In spite of the supposed disclaimer of Gorgias recorded by Athenaeus,^b the opinions on Rhetoric attributed to him by Plato are probably genuine. The praise of philosophy attributed to him in a collection of sayings^c can hardly be genuine, neither can the view given as his in a Graeco-Syrian collection, that 'the beauty of what is hidden cannot be expressed in words'.^d Gorgias' belief in the surpassing power of words is expressed by himself in the *Encomium on Helen*,^e which fully bears out Plato's representation of his views.^f

The only scientific theories attributed to him are entirely derivative. He taught the Empedoclean theory of colour, that it was a kind of effluence from shapes, fitting the paths of sight, and so perceptible.^g Socrates in the *Meno* stigmatizes this as a 'high-flown answer',^h though he himself treated the question of colour on the same lines in the *Theaetetus*ⁱ and the *Timaeus*.^j Gorgias seems to have contributed nothing to the theory, unless perhaps he applied it to the explanation of the power of a bright surface, such as glass or metal, to reflect heat rays and cause combustion,¹ but probably this too is derivative, being a record of one of Empedocles' experiments. These views may have been found in an early treatise on physical science written when he was still under the influence of his teacher, and before he had given himself up to oratory. One writer attributes to him Anaxagoras' theory that the sun is a molten mass,^k this would imply a continued interest in physical science, and a knowledge of Athenian thought before his visit there, for Anaxagoras was exiled from Athens between 450 and 430 B.C. But the lateness of the authority (Sopater, in the fifth century A.D.) forbids any attempt to draw conclusions from this statement; the attribution is more probably mistaken. A metaphysi-

^a *Gorg.* 462D sqq. ^b 503e ^c B29 ^d B28 ^e B11 §8 ^f *Gorg.* 452D

^g B4 ^h 153D, 156B-E ⁱ 45D ^j B5 ^k B31

¹ *E.g.* the encomiastic (448C). This short passage is full of Gorgian tropes ἐκ τῶν ἐμπειριῶν ἐμπειρώς, ἄλλοι ἄλλων ἄλλως and ἐμπειρία μὲν γὰρ ποιεῖ τὸν αἰῶνα ἡμῶν πορεύεσθαι κατὰ τέχνην, ἀπειρία δὲ κατὰ τύχην

cal statement attributed to him, that Being is invisible because it does not succeed in appearing, and appearance is feeble because it does not attain to Being,^a cannot be reconciled with the nihilism of his essay on Being, and if genuine, must have come from another work.

He was not greatly interested in ethics. His pupil Meno is represented by Plato as saying that one of the reasons for his admiration of Gorgias is that Gorgias never professed to teach virtue, and laughed at others who did, he claimed only to make his pupils skilled speakers.^b Meno therefore refuses to say what Gorgias thought virtue was,^c and he himself, when asked for a definition, gives a list of the various virtues, those of a man, a woman, a slave, a child.^d This is of course criticized by Socrates, but Aristotle prefers Gorgias' enumeration of the virtues to Socrates' general definition.^e Gorgias' ideal of virtue for a man can be found in his own words in the *Defence of Palamedes*,^f of women, he said that a woman's reputation, not her looks, should be well-known.^g He appears to have set a high value on friendship. Plutarch reproves him for saying that it is justifiable to do wrong in the endeavour to help a friend.^h He attributed his great age and unimpaired faculties to his moderation.ⁱ

His fondness for poetical diction suggests a love of the poets. He is reported to have called Tragedy a form of deception in which the deceiver is more honourable than the deceived, and the deceived wiser than the non-deceived, the former because he makes a promise and fulfils it, the latter because he grasps the unperceived more easily through the enjoyment of words.^j Nothing is left of any literary criticism except a remark on Aeschylus' *Seven Against Thebes*, that it is 'full of Ares',^k this was quoted by Aristophanes in the *Frogs*.^l He is also said to have traced Homer's descent not from Orpheus but from Musaeus.^m

^a B26^b A21^c B4^d B19^e B18^f B11a §12^g B22^h B21ⁱ A11, A12, A13^j B2j^k B24^l 1021^m B25

83 LYCOPHRON

LYCOPHRON 'the Sophist' · birthplace unknown; lived probably in the first half of the fourth century B.C.

Lycophron is mentioned several times by Aristotle, his nationality and exact date are unknown, but it is clear from Aristotle's references to him in the *Rhetoric* that he was, like Alcidas, a Sophist of the school of Gorgias. He was also interested in metaphysics, physical science and politics. He is sometimes called 'the Sophist' by Aristotle (and by Aristotle's editor Alexander of Aphrodisias) doubtless to distinguish him from Lycophron of Pherae.¹

In metaphysics, he was interested in the question of unity, and the relationship between matter and form. Aristotle mentions Plato's term 'participation', and says that others, including Lycophron, call it 'association',^a and define knowledge as 'the association between the act of knowing and the soul'.^a The same argument applies to this, Aristotle says, as to the definition of life as the 'synthesis' or 'connexion' between body and soul: soul and body are essentially a unity, and so too are matter and form, so that it is absurd to search for terms describing the relationship between them.^a The commentator Alexander defends Lycophron's definition, saying that if he had been asked what was the cause of the unity between knowledge and the soul, Lycophron would have said 'their association'.^b

Lycophron's attempt to solve the metaphysical question raised by predication was equally superficial. The problem, raised by the Eleatics and Heraclitus, and stated by Plato in the *Sophist*,^c was whether the application of epithets to a subject makes that subject no longer a unity but a conglomeration of

^a 1 ^b 2 ^c 251B

¹ Lycophron of Pherae was the son of Jason and brother of Thebe, wife of Alexander tyrant of Pherae, he murdered Alexander with the help of his sister and two brothers Tisiphonus and Peitholaus. Lycophron and Peitholaus surrendered to Philip of Macedon in 352 B.C. Lycophron of Pherae and Lycophron the Sophist were confused by earlier editors, as they are both mentioned in Aristotle *Rhetoric* III, Lycophron the Sophist in 1405b and 1406a, Lycophron of Pherae in 1410a. The mistake persists in Ross, *Aristotle's Metaphysics*, 1045b10, note *ad loc.* (Vol. II, p. 239).

² συνουσία instead of μεθεξής

³ Ross, *Aristot. Met.* 1045b12-16 note (Vol. II, p. 239)

many things does 'the man is white, tall, good', and so forth, make the unity, man, into a plurality, whiteness, tallness, goodness and the rest? Lycophron and others thought to have solved the difficulty by getting rid of the verb 'is', and substituting the perfect passive of the verb 'to whiten', and so on ^{a, a1}

In the *Politics*, Aristotle attacks his view that the law is merely a covenant, a 'guarantee of mutual justice' between men, instead of being, as it ought to be, a means of making the citizens good and just. Unless the State regards its laws as an educational force, it is merely an alliance of individuals, and the only difference between different States will be their locality. The likeness between the views of Lycophron and those put forward by Glaucon in the *Republic*,^b that law is a social compact 'not to harm or be harmed', is obvious. A more original point of view is attributed to Lycophron on the subject of high birth: contrasting it with other good things, he said, 'Its beauty is uncertain, its dignity a matter of words', that is, its high position is based only on opinion, whereas in reality the low-born are no different from the high-born.^c

In rhetoric, he is grouped with Gorgias and Alcidas. He provides examples of *frigid diction*, compound words, as in 'the varying-featured heaven of the mighty-peaked earth', and 'the narrow-channelled shore',^d and strange or obsolete epithets such as 'Xerxes, monstrous man', and 'Sciron the ravager'.^e

He also followed the plan of Gorgias when writing eulogies, of avoiding monotony by extending the praise to subjects other than that laid down. For instance, when asked to speak in praise of the lyre, he passed rapidly from the instrument to the constellation called the Lyre, and so succeeded in improvising a long and eloquent oration.^f Aristotle commends this device, as taught by Gorgias and employed by Isocrates.^g Elsewhere Aristotle gives a better example of the usefulness of the device when the subject is difficult: a speaker asked to praise the dog (held in low esteem in Greece) would include in his eulogy the constellation (Sirius) or Pan, who, as Pindar says, was called 'the hound of the Great Goddess' by all the Olympians.^h

^a 2 ^b 359A ^c 4, Plut. *de Nobil* 18

^f 6, Aristot. *Top* 174b32, cp. 82B17

^h Aristot. *Rhet* 1401a15, Pindar, *Frg* 96

^{a1} λελευκωται instead of λευκός ἐστι

^d 5, cp. 82B15 ^e 5, cp. 82B5a

^g Aristot. *Rhet* 1418a29 sqq

84. PRODICUS

PRODICUS of CEOS lived in the latter half of the fifth century B.C.

The dates of Prodicus' life are nowhere given, he is depicted as famous and sought after in Plato's *Protagoras*, the dramatic date of which is probably about 432 B.C.^a He is mentioned in the *Clouds*^a (423 B.C.) and the *Birds*^b (414 B.C.), and he was still active in 399 B.C. when Socrates was put to death.^c The suggestion in Suidas and others that Prodicus also was put to death for corrupting the youth is due to a confusion with Socrates, and the alleged law of Ceos commanding those over sixty years old to drink hemlock.^d

He was a native of the town of Ioulis in Ceos, and came frequently to Athens on public business as a delegate from Ceos.^e Plato in the *Hippias Major* mentions an occasion on which Prodicus addressed the Boulê and made a very favourable impression, he also gave private displays of oratory, and attaching to himself the young and wealthy as pupils, made large sums of money.^f Like Gorgias and Hippias, he travelled from city to city in the exercise of this profession, when at Athens, he was, like the other Sophists, entertained at the houses of the wealthiest men, such as Callias,^g who was eager to learn from him and willing to pay.^h Socrates himself paid to hear Prodicus,ⁱ though he could afford only the one-drachma course; the full course in terminology cost fifty drachmas, and this was the one most sought after. His charges however seem moderate compared with the fee of one hundred minas said to have been asked by Protagoras and Gorgias.^j Socrates also used to send to Prodicus any young men for whom he felt that he himself could do nothing.^k

Among those listening to Prodicus at Callias' house were Agathon and Pausanias.^l Other pupils of his were said to have been Euripides,^m Isocrates,ⁿ Theramenes,^o Thrasyarchus.^p There was a tradition (preserved by Philostratus) that he taught Xenophon;^q but this is based on a story that Xenophon was once a prisoner of war in Boeotia in his desire to hear

^a 360 (A5) ^b 690-2 ^c A4, A1 ^d A3 ^e A3 ^f A2, B9 ^g A4a
^h A11, A18 ⁱ A3a ^j A2 ^k A8 ^l A7 ^m A6 ⁿ A4b ^o A1a

¹ See above, pp. 343-44

² See below, p. 374

³ See above, p. 345, note ^{e1}

Prodicus, he obtained his release on parole by giving a security for his person. Nothing is known of this imprisonment; it is probably connected with the chronologically impossible story that Xenophon fought at Delium in 424 B.C.,¹ and is therefore to be rejected. It is however both possible and likely that Xenophon heard Prodicus at Athens at some time. The story of Xenophon's imprisonment in Boeotia is probably part of another version of the story that Socrates saved him in that battle; and his supposed eagerness to hear Prodicus is based on the fact that he preserved a long extract from one of Prodicus' works

Plato's portrait of Prodicus in the *Protagoras*, still in bed when the others are walking in the colonnade, and wrapped up in many coverlets,^a gave rise to a tradition that he was pleasure-loving,^b just as Plato's mention of his deep voice reverberating through the emptied store-room of Callias' house, and the difficulty that Socrates, standing outside, had in hearing this 'man of divine inspiration and universal wisdom',^c was later interpreted to mean that Prodicus as a public speaker was difficult to hear.^d

Prodicus is most frequently mentioned by Plato, doubtless from personal knowledge, though he did not think it worth while to use him as a principal character in any dialogue. Almost all Plato's references are concerned with Prodicus' teaching of 'correct terminology'. This is mentioned also by Aristotle. Xenophon in the *Memorabilia* has preserved a version (for which apparently he did not wish to claim verbal accuracy)^e of one of Prodicus' pieces written for display, the *Choice of Heracles*,^{d, d1} this was also referred to by Plato in the *Symposium*.^e

^a A2^b A1a^c A1a^d B2^e B1

^{d1} The title Ὀψαί given by the Scholiast on Aristophanes may be a later addition, as Diels suggests, like the Μοῦσαι of Herodotus. It may indicate that the Heracles-allegory was one of a collection.

¹ If Xenophon fought at Delium, he must have been born in about 444 B.C., and therefore was over 40 years old when he took part in the expedition of Cyrus in 401 B.C. But he implies (*Anab.* VI, iv, 25) that he was not over 30, i.e. was born about 430 B.C. The Delium-story was that Socrates saved Xenophon in the battle (Strabo, 403, Diog. L. *Xenophon*). This is a confusion with Plato's testimony that Socrates saved Alcibiades at Potidaea, and that at Delium, Socrates retreating with Laches showed the greater presence of mind (*Sympos.* 220E 199). Another suggestion is that Xenophon was captured when the Boeotians took Oropus in 412 B.C. (Thuc. VIII, 60).

² Mem. II, 1, 21 (Socrates) ὥς τις λέγων, ὅσα ἐγὼ μνησκαί. This, though dramatically appropriate to Socrates, who posed as having a bad memory (*Protag.* 314C), also excuses Xenophon from having to quote exactly.

It was an exercise in speaking on a set theme, probably meant as a guide to pupils, for he, like Protagoras and Gorgias, also used this method.^a Besides this he was credited with a book *On Nature*, or *On the Nature of Man*, containing scientific and medical views, it is not known whether his opinions on the gods were set out in this book or in a separate treatise. Aristophanes in his jokes against Prodicus treats him as a 'meteorosophist'. Prodicus seems to have described Sophists as occupying a half-way position between the philosopher and the statesman, and so combining the virtues of both.^b

Plato gives many examples of Prodicus' teaching of 'correct terminology'. He endeavoured, first, to distinguish between words in common use which were usually treated as synonyms or nearly so, and to give each of them a distinct and different meaning.^c Sometimes the distinctions drawn were justifiable and useful, sometimes interesting and important (as the distinction between 'the fearless' and 'the brave' in the *Laches*),^d sometimes of little importance,^e sometimes misleading (as the example given by Aristotle of Prodicus' alleged division of pleasures into three),^f when the terms used really are different names for the same thing. Prodicus applied this 'craft' to discussions of the poets and their exact meaning. Plato shows him at work on Simonides^g and Hesiod.^h Such, according to Socrates, was the teaching given in the fifty-drachma course, which he says in the *Cratylus* he could not afford and so did not master,ⁱ but elsewhere, in the *Charmides*, he says he has heard Prodicus drawing countless such distinctions between words.^j Prodicus was not alone in teaching this subject. Protagoras also taught it, and so apparently did Damon, but Prodicus was the best of the Sophists at this branch.^k

He also applied his craft to the terminology of science: an example is quoted with disapproval by Galen, in which Prodicus wished to apply the term 'phlegm'^l (generally used of the cold 'humour' of the body) to the hot humour, on the strength of a fancied etymology, and to provide a new term for the cold humour.^m Whether any of these attempts were more successful

^a A10 ^b B6 ^c A13, A15, A16, A17, A18 ^d A17 ^e A15
^f A19 ^g A14 ^h A18 ⁱ A11 ^j A18 ^k A17 ^l B4

^m φλέγμα was connected with φλέγειν by Philolaus (44A27), and with φλεγμῶνῃ by Democritus (68A159), as they considered that 'the cold humour' was the principal cause of fever. Whether they owed this point to Prodicus or he to them cannot be determined, since they were all contemporaries.

than the one quoted, we do not know; but it seems likely that Prodicus' work had in general considerable influence, attracting attention to the necessity of establishing an accurate terminology in scientific discussion and writing. Plato's references to Prodicus, though tinged with irony, are not wholly disparaging, and Thucydides is said to have admired his exactitude of diction ^a

Prodicus, like Gorgias and Protagoras, also taught rhetoric by means of the model discourse on a set theme (*communis locus*).^b He also gave general hints, though he is not credited with having written a text-book. He said, in opposition to Gorgias, that the proper length of a speech was neither very long nor very short, but moderate ^c He used, when his hearers were nodding, to stimulate them by throwing in something unexpected ^d His Heracles-parable, written for public delivery, was preserved by Xenophon from memory only, and Xenophon makes Socrates say that Prodicus adorned the speech with more magnificent diction, so that his style cannot be altogether judged from the extract given ^e In it, Virtue and Vice in the form of women appear before the young Heracles and advocate their respective ways of life. It was said that the parable was in great repute at Thebes, and still more so at Sparta, because of its educational value for the young.^f

From this, it seems that his ethical position was conventional. he advocated a life of honourable toil rather than pleasure. A saying of his is recorded by Stobaeus that desire when doubled is love, love when doubled is madness ^g He is also credited with having preached that the goodness of things such as wealth is relative to their users, this fact, noted by Democritus,^h was held by the Sophists to prove that good and bad are themselves relative, as opposed to the theory of Plato and his followers that absolute good exists ⁱ

Of his views on natural science nothing remains. Even the title of his book is doubtful. Cicero calls it *On the Nature of Things*,^j Galen *On the Nature of Man* ^k Aristophanes treats him as one who wrote on cosmology,^l but the only certain reference, that to the term 'phlegm', suggests medical interests.^m He did, however, write on the nature of the gods: he said that

^a A 9^b A 10^c A 20^d A 12^e B 2^f Philostr. *V.S. Praef* (Diels, *Vors* II, p. 309 note)^g B 7^h 68 B 172-3ⁱ Ch 90, 1^j B 3^k B 4^l A 5, cp B 10^m B 41, cp. B 11

things which are useful to man, such as the heavenly bodies, rivers, springs, food, wine and so forth, came to be regarded as divine; bread is called Demeter, wine Dionysus, water Poseidon, Fire Hephaestus, he compares this with the Egyptian worship of the Nile.^a All man's practice of religious rites and mysteries is concerned with the benefits of cultivation.^b This reduction of divinities to natural phenomena is found also in Democritus (though he does not forget to account for the feeling of awe, as well as that of gratitude, towards the gods),^c and seems to be derived from him, for his pupil Diagoras of Melos was the most prominent of the 'atheists' and is said to have been expelled from Athens in 411 B.C. for his attacks on religion and especially on the Eleusinian Mysteries.^d This method was taken over by the Cyrenaic school, its chief exponents were Euhemerus and Theodorus at the end of the fourth century, and Persaeus the Stoic in the first half of the third century B.C.

In the dialogue *Axiochus* falsely attributed to Plato, Prodicus appears as a grasping Sophist who teaches nothing without a fee, and as giving an address in which he said things about life so derogatory that Socrates was ready to die away.^e He is also depicted as uttering the Epicurean argument that death is not to be dreaded because it is the concern neither of the living nor of the dead.^f It is thought that the dialogue, which is a mixture of later, especially Cyrenaic and Epicurean doctrine, attributes this attack on life and indifferent attitude towards death to Prodicus because he was a native of Ceos, where there was said to be a law enacting that all those over sixty years of age must drink hemlock.^g

The rivalry between Prodicus and Gorgias^h has been already mentioned.ⁱ Nothing is known of the quarrel between Prodicus and Anaxagoras mentioned by Athenaeus,^j some have emended 'Anaxagoras' to 'Protagoras' on the ground that Prodicus and Protagoras were both professed experts in correct diction, and therefore rivals; but a meeting between Prodicus and Anaxagoras is not impossible, and as Prodicus was also interested in natural science, some controversy may have arisen of which no record is preserved.

^a cp 73B7 §3^b B5^c 68A75, 68B30^d B5^e B9^f *Axioch* 369B, Epicurus *Ep* III, 125^g Strab X, 486, cp Menand Frg 613K^h A20, 80A26; 82A24ⁱ A4b^j Above, p 357

85. THRASYMACHUS

THRASYMACHUS of CHALCEDON was active in the latter half of the fifth century B.C.

Little is known of Thrasy-machus apart from his work. He was a native of Chalcedon, a colony of Megara. He travelled in the exercise of his profession, and spent much time in Athens and in Thessaly. He eventually returned to his native city, and died there: his tomb was seen some two centuries later by Neoptolemus of Paros, who recorded its inscription in his book of epitaphs.^a There was a tradition, touched upon by Juvenal, that his death was unhappy, but nothing further is known of this. The Scholiast, probably guessing, says that he hanged himself.^b Nothing else is known of his life. He is regarded by Aristotle as the rhetorical heir to Teisias, but it does not follow that he was actually the pupil of Teisias.^c He influenced most of his contemporaries, but it is not certain which of them he actually taught, except Cleitophon the son of Aristonymus, of whom nothing is known except from Plato.^d

He left a large number of writings, which were still extant in Cicero's day.^e Chief among these was a work called the *Great Text-book*,^{f, f1} the title probably implying the existence of an abridged edition. There was also a book of *Subjects for Oratory*,^{g, g1} which doubtless contained examples or model speeches on set themes (*communes loci*). Among his own examples we hear of deliberative or public speeches,^{h, h1} and essays written in jest, like the *Helen* of Gorgias.^{i, i1} Dionysius of Halicarnassus says that Thrasy-machus left no forensic speeches, but he did not neglect the technique of forensic oratory, for he wrote a book of examples of oratory designed to arouse compassion in a jury.^j A book of *Prooemia* is also mentioned.^k There was also a collection called *Preponderances*, on the analogy of Protagoras' *Refutations*.^{l, l1} From the passage in Plutarch in which this

^a A 8 ^b A 7 ^c A 2, cp A 1 ^d *Republ.* 328B, 340B, and *Cleitophon*

^e *Cic. Orat.* 175 ^f B 1, A 1 ^g A 1 ^h A 1, B 1 ⁱ A 1 ^j B 5 ^k B 4 ^l B 7

^{f1} Μεγάλη Τέχνη

^{g1} Ἀφορμαὶ ῥητορικαὶ

^{h1} συμβουλευτικοὶ (λόγοι), δημηγορικοὶ λόγοι (probably the same)

ⁱ¹ παίγνια Cp B 2 B 11 § 21

^{l1} Ὑπερβάλλοντες (λόγοι), cp Protag. Καταβάλλοντες (80B1)

collection is mentioned (together with the *Topics* of Aristotle) it appears that it consisted of a collection of subjects for comparison, designed to show how the superiority of certain persons or things could be demonstrated to an audience. Whether any of these separate titles are not those of separate works but of chapters of the *Great Text-book* cannot usefully be discussed.

One long example of his style is preserved by Dionysius^a from one of his 'public orations'; it is quoted as an example of style, but its subject is Athenian internal politics during the Peloponnesian War, and it has the air of a speech meant to be taken seriously, not used merely as a model by pupils. Dionysius, however, says that Thrasymachus left no actual deliberative or forensic speeches, but was given up to technical instruction and speeches for display, and as Thrasymachus was not an Athenian, he could not have addressed the Ecclesia or the Boulê on matters of internal politics. It seems likely, therefore, that the speech was a model written for pupils, but that the sentiments it expresses were such as would be popular with the type of pupil who came to Thrasymachus. In this sense it may have been a political manifesto for the oligarchical party, as has been suggested, but probably not in the sense that it expressed Thrasymachus' own views as a member of the party. This piece must have been written at some time before 403 B.C., when the democracy was finally restored. Another speech having contemporary affairs as its subject was called *On Behalf of the People of Larissa*. The theme was an appeal to other States, probably those of the Peloponnese, to ally themselves with the Thessalians against Archelaus of Macedonia, who reigned from 413 to 399 B.C. Only a sentence of Thrasymachus' speech survives,^b but the facts were used by Herodes Atticus, writing in the second century A.D., in his oration *On the Constitution*, and from this the trend of Thrasymachus' speech can be gathered.

The work of Thrasymachus was primarily concerned with the technique of Rhetoric. He is credited by Theophrastus with having originated the style called by Dionysius the 'middle diction', half-way between the 'austere' and the 'plain', the chief virtue of which is that it condenses the thought and expresses it tersely.^c This virtue is particularly necessary to

^a B₁^b B₂^c A₃

forensic oratory, and although Thrasymachus did not write forensic speeches for actual clients, as Antiphon and Lysias did, he trained pupils for this as well as for the other types,^a and greatly influenced actual practitioners. Dionysius, writing of his similarity to Lysias, is doubtful which influenced the other, and is inclined to put Lysias first,^b in this he was mistaken, for Lysias did not enter the arena until he accused Eratosthenes in 403 B.C. of the judicial murder of his brother Polemarchus; whereas Thrasymachus was already well known, and referred to by Aristophanes among the 'advocates', in 427 B.C.^c

Thrasymachus not only practised a pure diction, he was adept at the handling of period and colon,^d and he experimented in the use of rhythm, especially the Paean (—uuu, uuu—), being the originator of the study of the rhythms used in prose, though Aristotle complains that neither he nor his successors defined the exact use of such rhythms.^{e, e1} In this Thrasymachus greatly influenced Isocrates, who took up and developed the art practically, as Dionysius says,^f perfecting it so far as the orators are concerned; and Plato, who perfected it among the philosophers. It is notable that the long fragment of Thrasymachus which Dionysius quotes is free from hiatus (a feature of Isocrates' writing also), and contains both paeans and cretics (—u—), the cretic being the foot of which the paean is a resolution.^g His vocabulary, though it avoided the sensational, was also original where this could be effective,^h and he was included among the orators whose works were the subject of later word-books.^{i, i1} One of his metaphors is quoted by Aristotle,^j and shows that he had a sharp tongue, as also his portrait in the *Republic* reveals. One of his anecdotes is quoted by Athenaeus, of Timocreon the poet of Rhodes in one of his most bellicose moods.^k Thrasymachus also used the literary allusion: the surviving sentence of his speech *For the People of Larissa* is an echo of a line from Euripides' *Telephus*.^l

Thrasymachus excelled in the art of playing upon the

^a A13

^b A3

^c A4

^d A1

^e A11

^f B1, A12

^g Cic *De Orat* 183, 193, *Orat* 215

^h A4, A13

ⁱ A14

^j A5

^k B4

^l B2

^{e1} Aristot *Rhet* 1409a2. Aristotle says that Thrasymachus and his successors 'used the paean but could not say what it was'. This must mean that they could not say exactly what its place was in prose, not that they did not know what the actual foot was, which is unthinkable.

ⁱ¹ *Eg* the Vocabulary from the works of Demosthenes, Thucydides, Isaeus, Isocrates, Thrasymachus and other orators, by Vestunus, a sophist of Ioulis in Ceos, who epitomized the *Lexicon* of Pamphilus.

feelings of the audience.^a His special treatise giving examples of the method of arousing pity^b endeavoured to reduce this part of forensic oratory to a science. Such methods were deprecated by Socrates at his trial,^{c, c1} and satirized by Plato in the *Phaedrus*, where he expressly refers to 'the might of the Chalcedonian', which has mastered the oratory that laments old age and poverty^{d, d1}. Plato legislates against such 'improper entreaties and womanish lamentations' in the *Laws*.^e Thrasy-machus also gave examples of the method of arousing anger and then lulling it again, and of causing and settling dissensions.^{f, f1} This was of value to political orators. Pericles himself is said to have mastered the art of checking the Athenians in over-confidence and heartening them in their depression.^g The technique of stimulating the various emotions is described by Aristotle in the Second Book of the *Rhetoric*, which must have owed something to Thrasy-machus. It was Theophrastus, Aristotle's pupil, who credited Thrasy-machus with having originated the 'middle diction', so that obviously Thrasy-machus interested the Peripatetic school.

In concentrating on the effect of technique in swaying the emotions, Thrasy-machus was led to pay special attention to the divisions of the speech where such effects could be used particularly: the introduction and the peroration. He wrote a set of model *Prooemia*,^h and some have thought that the 'Compassion' speeches were epilogues, since the appeal to pity is most frequent at the end of a speech. This supposition is unnecessary: the appeal to pity could occur in the body of the speech, and the model passages were doubtless designed for all possible contingencies. The book on *Appeals to Compassion* did, however, contain a few directions on the art of delivery, recognized as part of the technique of acting.^{i, i1} Quintilian says that Thrasy-machus believed that delivery belonged to nature, not to art,^j this is obviously a misreading of Aristotle, who immediately after mentioning Thrasy-machus adds that a

^a 80B6 ^b B5 ^c *Apol* 35B, 38D ^d B6 ^e 949B ^f B6

^g Thuc II, 65, 9 ^h B4 ⁱ B5 ^j III, iii, 4

^{c1} ἐλεῖνὰ δράματα (*Apol* 35B)

^{d1} Cp *Phaedr* 272A ἐλεῖνολογία 267C sqq (B6) is also a parody of Thrasy-machus' style

ⁱ¹ 'Cause dissension' διαβάλλειν cp Plato, *Republ* 498C μὴ διάβαλλε, ἦν δ' ἐγώ, ἐμὲ καὶ Θρασύμαχον ἄρτι φίλους γεγυῆστας

ⁱ¹ Aristot. *Rhet* III, 1, 7 (1404a) ἡ ὑποκριτική, Lat. *actio*

talent for acting (of which delivery is a part) is natural, and not much dependent upon art, but that in so far as it is connected with speaking, it is subject to artistic rules.^a Prooemia, whether deliberative or forensic, were concerned rather with creating in the hearer a frame of mind favourable to the speaker than with appealing to the stronger emotions, Aristotle says that those who lay down definite rules for the contents of prooemia or indeed the other parts of the speech, are going outside the scope of their art.^b He himself defines the scope of the prooemium, both deliberative, epideictic and forensic; but he does not mention Thrasymachus in this connection, though he quotes Gorgias and others.^c The long extract quoted by Dionysius is a prooemium.^d It shows the speaker affecting unwillingness to speak, because of his youth and modesty, but driven to it by the serious state of affairs. The only other excerpt from a prooemium is the anecdote on Timocreon, which is comic in effect.^e

Dionysius' judgement on his technique was that he was clever, original and effective, able to use the style and diction the occasion demanded, but somewhat lacking in force.^f Philostratus passes an adverse judgement on the technique of Thrasymachus and others like him who professed the art of rhetoric.^g But Plato, who knew Thrasymachus personally, does not underestimate him: he draws a powerful picture of his vehemence in the *Republic*,^h and speaks in the *Phaedrus* expressly of his force.ⁱ According to Aristotle, Herodicus (presumably Gorgias' brother the physician) called Thrasymachus 'ever bold in fight', as his name signified.^j

As for his opinions the most famous is his declaration in the *Republic*, that Justice is the advantage of the stronger, and his violent defence of this thesis. Plato undoubtedly means this portrait to be accepted as genuine, and to imply that Thrasymachus was stating his own opinions. Thrasymachus, however, did not always maintain the same views about justice: in an unspecified speech quoted by Hermias, the Christian commentator on Plato, he said 'something like this: that the gods do not see the affairs of men, otherwise they would not have overlooked Justice, the greatest of the blessings possessed by man, yet one which we see mankind not using'.^k This implies a more

^a *Rhet* III, 1, 7 (1404a) ^b *Rhet* I, 1, 9 (1354b) ^c *Rhet* III, xiv (1414b) sqq
^d B1 ^e B4 ^f B1, A13 ^g B7a ^h A10 ⁱ B6 ^j A6 ^k B8

idealistic view of justice, but as its context is not known, and the wording admittedly is not exact, it cannot carry much weight against the evidence of the *Republic*. In the latter Thrasymachus' views are typically those of the Sophists,^a who did not believe in absolute values; in the quotation paraphrased by Hermias, the praise of justice is merely part of a proof that the gods are indifferent to human affairs.

That his teachings on justice were famous is clear from the dialogue *Cleitophon*,¹ in which Cleitophon is depicted as attacking Socrates on the ground that while urging men to care for their souls rather than their bodies, that is, pursue justice and not wealth, he does not explain to them what justice is and how they can attain it. Therefore Cleitophon will betake himself to Thrasymachus and others who can and will give this instruction. To this indictment the *Republic*, in which Cleitophon again makes a brief appearance,^b is a complete reply.

Thrasymachus was interested in politics also; but whether the views expressed in his speeches were his own, or those of the pupils for whom he catered, is uncertain. The long fragment of the speech on Athenian internal politics during the Peloponnesian War^c purports to be spoken by a young man who advocates the policy of the oligarchic party, namely a return to the 'ancestral constitution',^d as the only solution of the internal strife which is weakening Athens in the midst of a dangerous war. This constitution was called a limited democracy, and said to be that of Solon and Cleisthenes.^d One of its watchwords was 'concord'.^e In the speech *On Behalf of the People of Larissa*, the Larisseans are made to say (echoing a line of Euripides): 'Shall we who are Greeks serve Archelaus who is a barbarian?'^e thus excluding the Macedonians from

^a Cp *Gorg* 483D (Callicles speaking), *Laws* 715A (The Athenian speaking)

^b 328B, 340A

^c B1

^d Isocr. VII, 16 sqq

^e B2

¹ The genuineness of this dialogue has often been questioned, but is now generally accepted. It may be the beginning of a dialogue left unfinished because abandoned for the *Republic*, or it may be a statement of the case against the Socratic view of justice (as seen by critics) which served as a prelude to the *Republic*. Friedlander oddly thinks (with Dümmler and others) that the First Book of the *Republic* is a separate dialogue, which should be called *Thrasymachus*; he uses the *Cleitophon* as an argument in favour of this view, saying that it links on to the First Book and ignores the rest of the *Republic* (*Die Platonische Schriften*, p. 50, note 1).

² ἡ πατριος πολιτεία

³ δυνάμει Cp Thuc. VIII, 93 for the political sense, and Plato, *Cleitophon* 409E for the philosophical sense

the true Hellenic race; others who advocated Hellenic unity — Gorgias and Isocrates — preferred to point to Persia as the barbarian nation. Lastly, in the *Great Text-book* he mentioned the alliance of Chios with the Athenians at the outbreak of the Peloponnesian War, which led the Athenians to link the Chians with themselves in their prayers at all public sacrifices.^a This custom was still in vogue in 414 B.C. (when Aristophanes produced the *Birds*),^{b, b1} in spite of the mistrust in which the Athenians had held the Chians for at least ten years before;^c but in 412 B.C., when Chios led the revolt against Athens and suffered devastation, the practice must have been discontinued. Thrasy-machus' reference to this event therefore probably dates the *Text-book* considerably before 412.

Cicero groups Thrasy-machus with Prodicus and Protagoras as having both spoken and written on natural science,^d but nothing that remains supports the idea that Thrasy-machus had any interests except the technique of rhetoric, and politics

86 HIPPIAS

HIPPIAS of ELIS was active in the second half of the fifth century B.C.

Hippias was undoubtedly a native of Elis, he was sometimes confused with Hippias of Thasos, who lived at the same time and was put to death by the Thirty Tyrants,^e or even, in the Christian era, with Hippias son of Peisistratus.^f Like Prodicus, he is a character in Plato's *Protagoras*, the dramatic date of which is probably about 432 B.C.,^g and he is mentioned in the *Apology*, with Prodicus and Gorgias, so that he was active in 399 B.C.^h Beyond this nothing is known of his date. He was much younger than Protagoras,^b and he lived to old age.ⁱ

^a B1, Theopompus Frg 115

^b Aristoph *Av* 878-80

^c Thuc IV, 51

^d Ag

^e Lys XIII, 54

^f A15

^g A4

^h A7

ⁱ A2 §1

^{b1} — διδόναι Νεφέλοκοκυγλοισιν υγλείαν καὶ σωτηρίαν, αὐτοῖσι καὶ Χίοις

— Χίοισιν ἡσθήν πανταχοῦ προσκειμένοις

The Schol. says that Thrasy-machus in the *Great Text-book* says the same as Theopompus in the Twelfth Book of his *Philippics*, and quotes Theopompus (Frg 115) Οἱ δὲ πολλοὶ τοῦ ταῦτα πράττειν ἀπείχον, καὶ περὶ ἐκείνων καὶ σφῶν αὐτῶν ἐποιοῦντο, καὶ σπένδοντες ἐπὶ ταῖς θυσίαις ταῖς δημοτελείαις ἤρχοντο τοῖς θεοῖς Χίοις διδόναι τὰν ἀθά καὶ σφίσιν αὐτοῖς

¹ See above, pp 143-4

His teacher, called Hegesidamus by Suidas,^a is otherwise unknown. His widowed daughter (some said wife) married Isocrates. His third son, Aphareus, became a tragic poet, active in the middle of the fourth century.^b

Most of the data concerning Hippias are derived from Plato's dialogues, especially the *Hippias Maior*, this is closely followed by Philostratus.^c Hippias was a native of Elis, and therefore was naturally active at Olympia,^d like Prodicus, he was frequently sent on embassies for his native city, visiting Athens, Sicily,^e and above all Sparta, where he was particularly popular.^f At Athens he was received as an honoured guest at the house of the wealthy Callias, Plato depicts him with his own group of admirers, including Eryximachus, Phaedrus, Andron and a number of non-Athenians.^g It was said that Antisthenes introduced Callias to both Prodicus and Hippias.^h Plato also depicts him as engaged to give a demonstration of oratory at Athens 'in the school of Pheidistratus, at the request of Eudicus the son of Apemantus',^{i, j} and as boasting in the market-place of a visit to Olympia.^k He claimed, according to Plato, to have made more money than any two other Sophists; in Sicily he made more than Protagoras, and from one small town, Incycus, collected twenty minas in fees.^{k, l} At Sparta he made nothing, for though they like listening to him, they do not pay to be educated, that is, changed: change is against the law in Sparta.^l

Various writings are ascribed to him, of which almost nothing survives. He used to go to Olympia armed with material of every sort, epics, tragedies, dithyrambs, and speeches for display.^m One of the last was the *Trojan Speech* (wrongly thought by Philostratus to have been a dialogue)ⁿ in which Nestor was depicted as describing for the benefit of Neoptolemus by what pursuits a young man can gain a good reputation,^o nothing of this survives. There is a reference to a treatise called *Collection*, but whether this was a collection of famous women, or famous personages, or remarkable stories, cannot be determined.^p He also compiled a list of Olympic victors, this was thought by Plutarch to be of little value,^q

^a A1 ^b A3 ^c A2 ^d A8, A12, A2 §7 ^e A7, A2 §6 ^f A6 ^g *Protag* 315B

^h A5a ⁱ A9 ^j A12 ^k A7, A2 §5, cp 80A1 §52, 80A3, 82A4 §2

^l *Hipp Mai* 287B, C, 284C ^m A12 ⁿ A1 §4 ^o A9 ^p B4 ^q B3

¹¹ These persons are otherwise unknown

^{k1} See above, p 345, note ^{e1}.

though Hippias might be thought to have been very favourably placed for collecting these data. Of the treatise *Nomenclature of Tribes* nothing but the title survives;^a it may be derived from the *Hippias Maior*.^b He was employed by the people of Messina in Sicily to write the elegiac verses for the bronze statues which they dedicated at Olympia in memory of the boys' chorus drowned on the voyage to Rhegium; the statues, like the inscription, were the work of a local artist.^c Lastly, Hippias may have written a mathematical treatise on the properties of the *quadratrix*.^d

Hippias was highly gifted. He had a remarkable natural memory, being able to remember fifty names at one hearing,^e and he also aided his memory by means of a scheme which he taught to others.^f His special subjects were mathematics and astronomy, he was also interested in the elements of speech, letters, syllables, rhythm, and harmony.^g Some said that he also spoke on painting and sculpture.^h For the Spartans, who were not interested in natural science or the arts of speech, he learnt 'archaeology', the early history of families, the human race and its settlements, and the foundation of city-states.ⁱ In his discourse he strove to be original, he cultivated a copious, natural style, which although not thin, yet never had recourse to a poetical vocabulary.^j

Besides his immense learning, he also practised the crafts, apparently because of a belief that the proper goal for the individual man was self-sufficiency he once visited Olympia wearing and carrying only things that he himself had made — a ring, a seal, an oil-can and scraper, shoes, tunic, cloak and elaborate Persian girdle.^k

The originality aimed at by Hippias in his speeches was the result of eclecticism he claimed to have put together the most important and homogeneous sayings of his predecessors Orpheus and Musaeus, Homer and Hesiod, and the prose-writers, into a new and varied discourse.^l His study of the poets resulted in some minute emendations of Homer, depending on a changed accent, and having as their object the rescuing

^a B2 ^b A11 (*Vors* II, p. 129, l. 2)

^c B1

^d A11; A12, A2 §1

^e A5a, cp. ch. 90, 9

^f A11, A14, A2 §1

^g A2 §2

^h A11, A1 §3

ⁱ A2 §8

^j A12

^k B6

^l Later, more credulous ages believed that these prodigious memories were the result of drugs (A16)

¹ Heath, *Greek Mathematics* I, p. 226; see below, pp. 385-8

of Homer from the charge of having put a false statement into the mouth of Zeus, and of saying something incredible.^{a, a1} He also derived from legend and the poets much of his 'archaeological' lore: the continents Asia and Europe are named after the daughters of Ocean,^b the stepmother of Phrixus was named Gorgôpis (not Demodice as in the legend Pindar used),^c there was an Ephyra at Elis as well as the Ephyra mentioned by Pindar,^d Lycurgus was a warrior as well as a statesman,^e these facts may have come from the *Collection*, or from the *Nomenclature of Tribes*, though their origin is not specified. The only fact actually attributed to the *Nomenclature* is that Hippias (as well as an unknown writer Atrometus) said that there was a tribe called Spartoi.^f The *Collection*, whatever its nature, contained an account of Thargelia of Miletus, who flourished in the time of Dareius and was famed for her beauty, charm and wisdom. She married fourteen times, and imbued all her husbands with pro-Persian sentiments, her influence on politics through these influential men served as a paradigm for Aspasia, so Plutarch says.^g The interest in Thargelia was perhaps stimulated by a desire to please Aspasia, also a Milesian, but it may sometimes have had a Thessalian audience in view, since one of Thargelia's husbands was the Thessalian king Antiochus.^{h, h1}

^a B20^b B8^c B14^d B15^e B11^f B2^g Plut. *Pericl* XXIV, Suid s.v. *Thargelia*, Philostr. *Ep* 73, Athen. 608f^h 82A35

^{a1} Aristotle, *Poet* 1461a21. These emendations are ascribed by Aristotle to Hippias of Thasos, of whom nothing is known except that he was put to death by the Thirty (Lys. XIII, 54), but Plato in the *Hippias Maior* (A11) especially mentions Hippias of Elis' minute studies in 'letters, syllables, rhythms and harmonies', so that Aristotle's examples probably belong to him. Aristotle gives the same two examples in *Soph. El* 4, 166b1, but without mentioning Hippias, the Scholiast here supplies 'of Thasos' from the *Poetics*.

The 'solutions' were as follows. 1. Hippias, reading διδόμεν δέ οἱ εὖχος ἀρεσθαι ('we give to him the winning of glory', instead of our MSS. τρωσσοῖ δέ κήδε' ἐφ' ἡπται *Il* II, 15) wished to change this to διδόμεν δέ οἱ (διδόμεν = διδομένοι, infinitive for imperative) making Zeus command the Dæmon to give the glory, instead of himself uttering a false statement. 2. τὸ μὲν οὐ κατασθεται θυρῶν (*Il* XXIII, 328), of a tree-stump that 'does not rot in the rain'. Hippias changed οὐ to οὗ, 'a part of it rots in the rain', as making the statement credible. See Aristotle, *Poetics*, ed. W. Hamilton Fyfe (Loeb), pp. 106-7.

^{h1} See above, p. 356n. Wilamowitz, *Platon* II, p. 25, note, thinks that Aeschines the Socratic owed his knowledge of Thargelia to Hippias, not to Gorgias. He says that B4, given by Diels as the words of Hippias, cannot be genuine: στρατηγεῖν used transitively is a later solecism. Hippias, however, sometimes used dialect words (B10) and perhaps un-Attic constructions also.

Hippias did not confine his Homeric studies merely to words and accents; he discussed the characters of the *Iliad*, saying that Achilles was the bravest, Nestor the wisest, and Odysseus the most resourceful of those who went to Troy.^a He pointed out that whereas later poets call 'tyrants' the kings before the Trojan Wars, Homer does not know this word, using 'king' even for the impious Echetus.^b 'tyrant' came into use at about the time of Archilochus.^c He also speculated on the birthplace of Homer, assigning this honour to Cyme.^d

Of his astronomy, nothing is left except that, with Pherecydes, he said that the Hyades were seven in number.^e This is probably derived from a historical account of past scientific discoveries: he is said to have recorded that Thales gave even inanimate objects a soul, on the strength of his observations of the magnet and of amber.^f He also recorded the history of mathematics, he mentioned the otherwise unknown Mameucus, brother of Stesichorus the poet, as having won fame as a geometer.^g This scientific history might have been thought, from Plato's evidence,^h to be merely a rhetorical work in which the scientists who were Hippias' special interest were eulogized as were legendary heroes, kings and the like by other orators, but there is one discovery attributed to Hippias which differentiates him from all the other Sophists and places him in the ranks of the scientific discoverers, namely the invention of the *quadratrix*.

The ascription of this discovery to Hippias rests on two references in Proclus' *Commentary on Euclid*. In one of these Proclus, giving the various methods of trisecting a rectilinear angle, says that some have done this by means of the *quadratrices* of Hippias and Nicomedes,ⁱ in the other, giving the mathematicians who have used different sorts of curves, he mentions the *quadratrices* of Hippias.^j Proclus does not expressly say that this was Hippias of Elis, and some therefore have postulated another Hippias, the name being common.^k But Proclus, earlier in his *Commentary*, did mention 'Hippias of

^a A10 ^b *Od* XVIII, 85 ^c B9 ^d B18 ^e B13, 2B18 ^f B7, above, p. 53

^g B12 ^h *Hipp Mai* 281C, 282A ⁱ B21 ^j Procl *Eucl* I, 356, 6-12

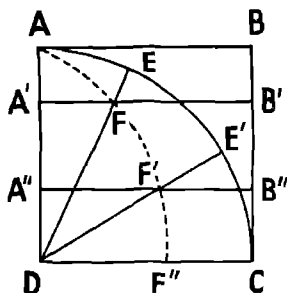
^k Other methods: the conchoidal curves of Nicomedes, and the spirals of Archimedes (Procl in *Eucl* I, 272, 1-12)

^l As well as the conchoids of Nicomedes and the spirals of Perseus

^m E.g. Wilamowitz, who says simply that the ascription of mathematical discoveries to the Sophist Hippias is obviously arbitrary (*Platon*, I, p. 133, note 3)

Elis' as having recorded the mathematical fame of Mamercus;^a and if he had meant a different Hippias in the two later passages he would have made this clear by a designation. It is therefore safe to ascribe to Hippias the discovery of the *quadratrix*. Nothing can be argued from the silence of other writers.

The curve called *quadratrix* is described as follows:



Let ABCD be a square

Let a quadrant AEC of a circle with centre at D be described in ABCD

Let it be supposed that the side AB moves towards and parallel to DC (taking up positions A'B', A''B'')

And let it be supposed that the radius of the circle moves from AD to DC simultaneously (taking up positions DE, DE')

Then the moving radius AD and the moving side AB will intersect at a series of points, F, F'

The path AFF'F'' of this moving point of intersection is the *quadratrix*

The curve could be used for the solution of two problems which greatly exercised early mathematicians.¹ the trisection of any given angle (and its division according to any ratio), and the squaring of the circle. The question whether Hippias himself used it for either or both of these solutions is disputed.

First the trisecting of angles. Proclus though crediting Hippias with the discovery of the *quadratrix* says that 'others' have used the *quadratrices* of Hippias and Nicomedes for the trisection of angles,^b and it has been thought that this means

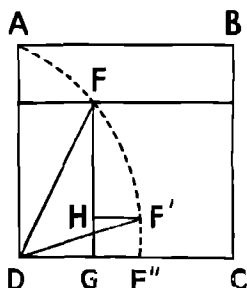
^a B12

^b B21

¹ E.g. Pappus and Iamblichus, who do not mention Hippias in their accounts of the squaring of the circle by means of the *quadratrix*. Pappus IV, pp. 250, 31-252, 31; Iamblichus *ap. Simplicius in Categ.* p. 192, 19-24K, 64B 13-18 Br, and Diog. L. who ascribes to Archytas, not to Hippias, the first solution (of a geometrical problem) depending on movement, the *quadratrix* requires the supposition of moving lines. For plausible explanations of these omissions see Pauly-Wissowa s.v. Hippias VIII, 1707 sqq.

that Hippias did not do so. This is unlikely: if Hippias discovered the peculiar properties of the *quadratrix*, as Proclus says, its most obvious property is its use for the trisection of angles, and Proclus means that Hippias and Nicomedes are the originators of this method, not that they did not use it themselves. It can therefore be plausibly inferred that Hippias used his curve for the trisection of angles.

The method of trisecting angles (or dividing them by any ratio) by means of the *quadratrix* is as follows.



If ABCD is a square, and AFF'F'' the *quadratrix*,

Let F be a point on the *quadratrix*

From F let FG be drawn parallel to AD, meeting DC at G

Divide FG in the required ratio at H

Draw HF' parallel to DC to meet the *quadratrix* in F'

Join DF, DF'

The resulting angles FDF', F'DC are in the ratio of FH to HG

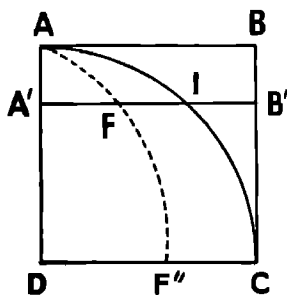
Thus the angle FDC can be trisected or divided in any given ratio by means of the *quadratrix*

Second, the squaring of the circle. the name given to the curve¹ implies that this was its primary purpose, but whether it was so named by Hippias and therefore so used by him is not known. Some think it unlikely that he did so use it because he is not mentioned by any authority among those who found solutions to this problem. Pappus and Iamblichus ascribe the squaring of the circle by means of the *quadratrix* to Deinostratus and Nicomedes. Others suggest that he discovered this use but was unable to furnish it with an exact proof that this was first done by Deinostratus, a pupil of Eudoxus the discoverer of the proof 'by exhaustion', and that therefore no credit was given to Hippias for his solution. It seems likely therefore that Hippias was aware of the value of the *quadratrix*

¹ τετραγωνίζουσα (B21)

towards squaring the circle, but was unable to work out the method and proof with sufficient exactitude ¹

The squaring of the circle by means of the *quadratrix* was as follows:



If ABCD is a square, AIC the quadrant, and AFF'' the *quadratrix* meeting DC at the point F'',

Then the quadrant AIC is to the side AD as AD is to DF''

Thus the quadrant AIC being the third term in a proportion of which the other two terms are straight lines, can be expressed as a straight line

A rectangle constructed on AIC thus reduced to a straight line, with the diameter of the circle (i.e. 2AD) as its other side is equal to the circle with the radius AD, since

$$\frac{2\pi r}{4} \times 2r = \pi r^2$$

From this rectangle a square of equal area can be constructed, and the given circle is squared

The objections to the method of finding the *quadratrix*, on which these solutions are based, were clearly seen in antiquity.²

Social Ethics According to Plato in the *Protagoras*, Hippias strongly supported the theory that Nature and Law are opposed that Law is a tyrant over mankind and forces men in many ways contrary to nature.³ In the dispute between Protagoras and Socrates over the method of conducting the discussion, Hippias is shown as an advocate of compromise and arbitration.⁴ Plutarch preserves some remarks of his on envy: there are two sorts, one right, one wrong. the right kind is that felt towards bad men who are honoured, the wrong kind that felt towards the good. Envious people have double sufferings

¹ Cf.

² See Pauly-Wissowa s.v. Hippias, Heath, *Greek Mathematics*, I, pp. 225-30

³ By Sporus, quoted in Pappus, IV, pp. 252, 26-254, 22. See Heath, *Greek Mathematics*, I, 229-30

for their own troubles and for the good fortune of others.^a These remarks may have been part of a speech *On Calumny* which began from the proverb 'Calumny is a dread thing': it is the weapon of the envious, and steals friendship, best of possessions, yet there is no legal penalty against it, so that it is worse than open injury.^b

The unwillingness of some modern scholars to credit Hippias with an exact and valuable mathematical discovery is due to the influence of Plato's portraits of Hippias in the two dialogues named after him, and in the *Protagoras*, as well as Xenophon's portrait of him in the *Memorabilia*. Plato undoubtedly writes of Hippias, as of the other Sophists, from personal knowledge, and to ~~him~~ nearly all our information is due. He grants to Hippias a vast amount of knowledge, especially in arithmetic, geometry, astronomy and language.^c Hippias' interest in politics^d and law^e is also brought out, as well as his ability to discourse on Homer and the other poets.^{f, g} But this knowledge is entirely discounted by the satire with which everything about Hippias is invested, satire which is even more pungent and continuous than in the portraits of Gorgias, Protagoras and Prodicus. Hippias, according to Plato, has in common with the other Sophists, and perhaps to a greater degree, the qualities of vanity, boastfulness and acquisitiveness. He claims, like Protagoras, to be able to make his hearers better,^h and he can not only answer any question so that no one can refute him, he can teach others to do so.ⁱ Questions like 'What is the nature of beauty?' seem to him absurdly easy,^j and even when he has been confounded by Socrates' dialectic, he is still confident that he could find the correct answer if given time to reflect, a claim which draws from Socrates the exclamation 'Don't boast!'^k He is accustomed to answering questions *ex cathedra*,^l on scientific subjects in which he is expert and need fear no contradiction. He is also used, like Gorgias, to speaking on any subject at the oratorical competitions at Olympia, where he boasts that he

^a B16 ^b B17 ^c *Hipp Min* 366C 399 ^d *Hipp Mai* 296A ^e *ib* 298D

^f *Hipp Min* 363C ^g *Hipp Mai* 283C, E ^h *ib* 286E, 289D ⁱ *ib* 295A

^j *ib* 295A ^k *Protag* 315C

^l The conversation of *Hippias Minor* takes place immediately after the lecture at the school of Pheidistratus, to which Hippias had invited Socrates in the *Hippias Maior* 286B, C. There is no sound reason for doubting the authenticity of the former dialogue.

has never met his match, and though he also expressly claims to answer any question and therefore will not shrink from Socrates' questions,^a he prefers public speaking to dialectic.^b His vanity about his personal appearance is as great as his pride in his intellectual achievements; Socrates calls him 'the handsome' as well as 'the wise',^c and comments on his fine clothes and shoes.^d It is clear that when he went to Olympia wearing and carrying only things that he himself had made, these were no rough and ready products of the amateur craftsman, the principal object of admiration being a copy of a richly-wrought Persian girdle.^e His idea of 'the beautiful' is at first entirely materialistic. It is 'a beautiful maiden',^f 'gold',^g or other means of adornment. Above all he is proud of his ability to make money by his talents: he boasts that he is in this respect greater than the reverend Protagoras,^h and that if anyone could have extracted money from the Spartans, it is himself.ⁱ

In all these qualities he is strongly contrasted by Plato with Socrates. his magnificence with Socrates' plainness, his riches with Socrates' poverty, his boastfulness with Socrates' ironic humility. But he is completely insensitive to irony. He treats Socrates with kindly condescension, even when the emptiness of his claims to wisdom have been almost brutally demonstrated, and he accepts Socrates' most ironical compliments in all good faith and with complacency.^j Yet his answers to Socrates' questions are more crassly foolish than those of any other of the Sophists except perhaps Euthydemus and Dionysodorus. His mentality approximates rather to that of the rhapsodist Ion than to that of Protagoras and Thrasymachus.

In the *Protagoras*, though Hippias is satirized on his first appearance, he nowhere displays the qualities of the two *Hippias* dialogues, he is given the rôle of mediator between Protagoras and Socrates, and appears in an amiable light.^k

It is not clear whether Xenophon's portrait in the *Memorabilia* is based on personal knowledge or on hearsay and on Plato's dialogues, the latter seems more likely.^{l, m} The dis-

^a *Hipp Min* 363C, 364A ^b *Hipp Mai* 304A, B ^c *ib* 281A ^d *ib* 291A

^e *Hipp Min* 368B, C ^f *Hipp. Mai* 287E ^g *ib* 289E ^h *ib* 282D ⁱ *ib* 284C

^j *E g Hipp Mai* 286A, 300D ^k *Protag* 337C 199 (C1) ^l *Xen Mem* IV, iv, 5

^m His opening is reminiscent of that of the *Hippias Major*: διὰ χρόνου γὰρ ἀφικόμενος δ' Ἰππίας Ἀθήνας (Mem), ὡς διὰ χρόνου ἡμῖν πατήρας εἰς τὰς Ἀθήνας (*Hipp Mai*) Xenophon says οἷσα δὲ ποτε αὐτὸν [Socrates] καὶ πρὸς τὸν Ἰππίαν διαλεχθέντα, thus implying that he was not himself present at this conversation

cussion is on law, divine and human; Hippias is shown conversing amicably with Socrates, and both asking and answering questions; it is Socrates who makes the only long speech on this occasion. Hippias is shown finally as agreeing that the distinction between justice and law does not exist, whereas in the *Protagoras* he is the exponent of the theory that nature and law are opposed. There is little irony in Xenophon's portrait, compared with the Platonic dialogues, Hippias' desire to be original is contrasted with Socrates' concern for the simple truth, but the vain, arrogant, learned yet stupid man of the Hippias-dialogues has disappeared.

It is impossible to analyse how much truth there is in Plato's portrait, and how much personal prejudice, since there is no standard of comparison. It can only be pointed out that this was the impression made by Hippias on Plato; and that Plato, detesting his general outlook and profession, gave him no credit whatsoever for any solid scientific achievements, thereby apparently doing him some injustice.¹

87. ANTIPHON THE SOPHIST

ANTIPHON, believed to be of ATHENS, and to have lived in the latter half of the fifth century B C.

The first question that arises over Antiphon is his identity. He is confused by ancient authorities with Antiphon the orator, and to a lesser extent with Antiphon the tragedian; it has even been disputed that Antiphon the Sophist and Antiphon the orator were different persons. However, it is now generally agreed that the latter two were different persons.^a Antiphon the orator came from Rhamnus in Attica and wrote the forensic speeches for cases of homicide, he was also a

^a A2

¹ A good case can be made out for the suggestion that the essay *De Arte* in the Hippocratic collection was written by one of the disciples of Hippias against Plato. The essay defends the existence of things seen and perceived, using the word εἶδη of their real essences, and defends also the sciences that seek fresh discoveries in the world of reality. To disparage such discoveries is not a proof of superior knowledge but of malevolence (87B1). The author is particularly concerned to defend the art of medicine, in which Hippias himself does not seem to have been interested, but the general argument is such as he might have used in defence of his mathematical discoveries. cp W H S Jones, *Hippocrates*, Vol II (Loeb), who suggests Hippias himself as the author.

politician and leader of the oligarchic party, and was put to death for his part in the oligarchic revolution of 411 B.C. Antiphon the Sophist was a seer, interpreter of dreams, and author of a book called *Truth* as well as other essays.^a His origin is not known. He is sometimes called Athenian, but this may be through confusion with Antiphon the orator, who, however, is usually called 'the Rhamnusian', perhaps to distinguish him from the Sophist. The third Antiphon, the writer of tragedies, lived at Syracuse in the first half of the fourth century and wrote tragedies both independently and in collaboration with Dionysius tyrant of Syracuse. He is confused sometimes with the orator, sometimes with the seer.^b

The judgement of Hermogenes (writing in the second century A.D.), that the orator and the Sophist are two different persons, is based on considerations of style. That of the murder-speeches is so different from that of the essay on *Truth* and the other speeches attributed to the Sophist that he tends to believe that the same man could not have written both. A reference to 'Antiphon the Rhamnusian' as the teacher of Socrates^c makes him waver, apparently because he thinks that Socrates would have preferred a Sophist to a writer of forensic speeches as his teacher, he also has heard that Thucydides was the pupil of 'the Rhamnusian', yet notes that Thucydides' style is nearer to that of *Truth* than to that of the murder-speeches. Nevertheless the great difference between the forensic speeches and *Truth* prevails, and he remarks that even if there was only one man who wrote all these works, the difference between the two groups of works is so great that each group would have to be dealt with separately.^d

It is now believed, on the strength of Thucydides' glowing testimony to the orator,^e that the latter was his teacher, any resemblance of Thucydides' style to that of *Truth* is better explained by his general interest in rhetoric. Moreover, Thucydides' notice goes far to prove that Antiphon the orator and Antiphon the Sophist were different persons. Thucydides mentions only political and forensic activities and says nothing about divination. It may be argued that Thucydides' silence comes of a lack of interest in or disapproval of mantic profes-

^a A 1^b A 6, A 7^c Plat. *Menex.* 236A^d A 2^e Thuc. VIII, 68

sions; but if this were so, he would not have gone out of his way to praise Antiphon so unreservedly.

One further problem of identity remains: was the Antiphon called 'the Sophist', who argues with Socrates in Xenophon's *Memorabilia*, the Antiphon who wrote *Truth*, or Antiphon of Rhamnus the orator, or Antiphon the tragedian, or none of these? This question was already debated in antiquity: one thesis apparently identified him with the tragedian.^a The opinions attributed to him in the *Memorabilia* might belong to any Sophist. His rebuke to Socrates for not entering practical politics^b has suggested to some modern writers¹ Antiphon the orator, and the title 'Sophist' could have been applied to the latter as a teacher of rhetoric. Fortunately, however, this question is decided by the testimony of Aristotle in his lost book *On Poetry*^c he says (in a fragment preserved by Diogenes Laertius) that two rivals of Socrates were Antilochous of Lemnos and Antiphon the Seer. This important fragment also establishes the separate identity of the orator and the seer. Aristotle could never have referred to the famous lawyer and political teacher simply as a diviner. Again, it makes probable the conjecture that Antiphon the seer was also an Athenian, as he is called by Suidas in two separate notices,^d if he had not been an Athenian, Aristotle would have given his nationality as well as that of Antilochous. It is probable that the orator's deme-name is usually given to distinguish him from a fellow-Athenian, the seer, who was perhaps a townsman.

The following account, therefore, is based on the belief that Antiphon the Sophist is distinct from the orator and from the tragedian, and that the writings of the Sophist were distinguished from those of the orator by their difference of subject-matter and style.² The teacher of Thucydides^e and Socrates^f was Antiphon the orator, the opponent of Socrates in the *Memorabilia* was Antiphon the seer.

Life Antiphon, an Athenian, was a rhetorician, seer and interpreter of dreams.^g Nothing is known of his life. It is

^a A4 ^b A3 §15 ^c A5 ^d A1 ^e A2 ^f *Menex* 236A

^g A1, A2

¹ E.g. Gomperz, who thought that the orator and the Sophist were identical.

² For a discussion and literature, see Pauly-Wissowa, Suppl. IV, 1 v. Antiphon, pp. 33 sqq., where, however, sufficient weight is not given to the frg. of Aristotle cited above (A5, Aristotle Frg. 75).

possible that in early life he set up at Corinth as a mental healer: his interest in rhetoric led him to believe that freedom from grief could be achieved if the patient would tell the cause of his trouble and submit to treatment by the soothing power of words.¹ Later, however, considering this 'art' beneath him, he turned to rhetoric.^a Apart from this, the only account that can be given of him concerns his writings and opinions.

Writings. His principal work was called *Truth*, like that of Protagoras; the title *On Truth*, sometimes given, is the less likely. It is meant to suggest an interpretation of the nature of reality as opposed to appearances, and was probably suggested by Parmenides' *Way of Truth*. This work of Antiphon's was in two or more books, of which a number of fragments remain, quoted by other writers; and two extracts recently discovered in a papyrus at Oxyrhynchus. Besides this major work, he wrote a rhetorical essay or speech meant for display *On Concord*, and another called *The Statesman* or *Discourse on the State*.^b Also attributed to him are a work *On the Interpretation of Dreams*,^c and an *Art of Rhetoric* (thought, even in antiquity, not to be genuine).^d A separate treatise, *The Art of Freedom from Pain*,^e is ascribed to the orator, probably by mistake for the seer. A few fragments survive from *The Statesman* and *On Concord*; of the rest there is no trace. The notice in Suidas^f describes Antiphon the seer as an epic writer also; but there is no reference to this in any other writer, and it is probably a confused recollection of Antiphon the tragedian. A work by Glaucus of Rhegium *On the Ancient Poets and Musicians* was ascribed to 'Antiphon of Rhamnus', perhaps the ascription meant was to Antiphon the seer, or the tragedian.^g

Hermogenes describes Antiphon's style as not at all suited to politics, but pompous and dogmatic, aiming at a grandiose effect and tending towards obscurity, he is careful in composition, and rejoices in rhetorical turns of speech, but lacks characterization and the stamp of truth, while even his cleverness is apparent, not real. These criticisms seem not altogether just. The surviving fragments show originality, continuity of thought, and clarity, and their rhetorical phrasing

^a A6 ^b A2 ^c A1 ^d B3 ^e A6 ^f A1 ^g A6

¹ This is conjecture. The 'cure by confession' is attributed to Antiphon the Rhamnusian, the orator. But there is a strong probability that it was the work of the seer.

is not so obtrusive as that of Gorgias. He had, however, a strong tendency to use poetical and archaic, especially Ionic words: Suidas records that Antiphon the seer was called the Word-Cook.^a His penchant for Ionic forms rather than Attic may account for the later belief that he was an epic poet.

'*Truth*' The first book of *Truth* apparently began by expounding a metaphysical position derived from the Eleatic school. all things are really one, and separate objects do not exist either for the senses or the mind, however far they may range.^{b, b¹} Experiences such as smell, sight, and the rest merely seem to happen, but do not really do so.^c Even time is not a thing but a thought, that is, a means of measurement.^d Mind leads the body in everything; health and disease depend on mind.^e It should therefore not be left unequipped.^f God lacks nothing and receives no increment, he is infinite and without needs.^g

In spite of this fundamental unity, however, there exists a world of sense-perception which can be studied and in which some things are nearer to reality than others. The real nature of an object such as a bed, for instance, is its original material, not the form imposed upon it. if you buried the bed, and the rotting wood conceived the power of growth, what would come up would not be a bed, but timber, therefore the timber is more real than its accidental form, since the nature of the former persists, and the latter disappears.^h The importance of material is again emphasized in a quotation which says that Nature if stripped of her resources would have arranged many excellent things badly.ⁱ

The second book appears to have described the present prevailing arrangement,^j that is, the world of sense-perception which does not really exist but only seems to do so, as opposed to the 'everlasting unchangingness'.^{k, k¹} Little remains of this cosmology, but a chaos was described, in which things were unarranged or not yet separated out, and there followed an

^a A1 ^b B1 ^c B5, B4, B6-B8, cp B42 ^d B9 ^e B2 ^f B3 ^g B10, B11

^h B15; cp Plato, *Republ* 597A 599 (the 'three beds') ⁱ B14 ^j B23 ^k B22

^{b¹} This fragment from Galen's commentary on Hippocrates is very corrupt in the only existing MS. Diels believes that it was preceded by the explanation that 'for the Logos all is one'. The general Eleatic sense is decided by Galen's introductory remarks that Critias and Antiphon oppose Mind to Sense-perception (88B40)

^{k¹} ἀειστός, a word coined on the analogy of Democritus' αἰστώ

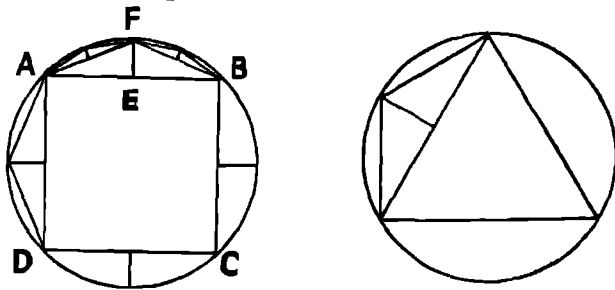
'arrangement',^a ^{a1} produced by an 'eddy' ^b He discussed the heavenly bodies: the sun is a fire which feeds on the damp air round the earth, and its risings and settings are caused by the varying prevalence of the fiery and damp elements.^c The moon has its own light, but the rays of the sun strike upon it and cause the parts round it to be dimmed, as a weaker light always dims a stronger.^d This explains its phases; it also happens with the other stars ^d For eclipses of the moon, since he had given the moon its own light he was forced to go back to the crude Heraclitean theory of the turning bowls ^e Hail is caused by the compression of rain-drops through contrary winds ^f Earthquakes are caused by (internal) fires,^g which burn and melt the earth, causing it to wrinkle and quiver.^h an observation derived from volcanic eruptions. Sea, as Empedocles said, is a kind of sweat,ⁱ that is, the first damp evaporated from the original mixture by the Hot. The moisture thus separated off collected together and is called sea, its saltness is caused by its being heated, as happens with sweat.^j Of the rest of the second book nothing is left but a single word quoted by a lexicographer, showing that Antiphon probably went on to discuss biology: he used the word 'hude' for human skin ^k Other isolated words thus quoted may perhaps be assigned to the same book, and show that he dealt with the embryo, and abortion,^l and possibly with diet and health,^m though the reference to stupeficientsⁿ may belong to the treatise on *Freedom from Pain*. From the remaining few words not even the subject under discussion can be gathered, it is possible that the reference to the tempering of bronze and iron,ⁿ and to creatures 'good at getting a living',^o may be part of a description of the evolution of the arts by early man, but it is not certain even whether these words occur in *Truth*.

Whether Antiphon's attempt to square the circle belongs to *Truth* or was the subject of a separate thesis cannot be ascertained. It is referred to by Aristotle in illustration of his point that not all mistaken propositions call for disproof, but only those in which the author, starting from sound first principles,

^a B24, B24a^b B25^c B26^d B27^e B28, 22A12, 24A4^f B29^g Cp 31B52^h B30, B31ⁱ B32, cp 31B55^j B32, cp 59A90, 64A17^k B33^l B36, B38^m B34ⁿ B40^o B41, cp B43

^{a1} He used the words ἀδιδασκτον, διδασκταις, διδασεις, not the Anaxagorean terms. διδασταις is Empedoclean 31B8

commits an error of reasoning ^a Antiphon's construction is described in full by Simplicius and Themistius.



A rectilinear figure such as a square (ABCD) is described within a circle. On each of its sides an isosceles triangle is described by bisecting the given side (AB) and erecting at the point of bisection (E) a perpendicular line intersecting the circumference of the circle (at F). The triangle AFB thus occupying a section of the circle can be similarly treated by the creation of triangles on its sides. Thus the space between the circumference of the circle and the sides of the polygon grows less and less until it is negligible, and the area of the polygon is equal to that of the circle. The same process can be carried out by using any other convenient rectilinear figure such as an isosceles triangle instead of the original square, and proceeding in the same way by describing isosceles triangles on its sides. It is obvious that this solution ignores entirely the real difficulty of the problem. The describing of triangles within the circle can go on *ad infinitum*, but the sides of the polygon so formed will never exactly coincide with the circumference of the circle. Antiphon was not a geometer, and his answer was therefore worthless.

The long fragments from the Oxyrhynchus papyrus^b (third century A.D.) come from *Truth*, a sentence from the first passage being already known from Harpocration.^c The foundations of human society are now under discussion. The definition of Justice as obedience to the laws of the State (which is maintained by Socrates in conversation with Hippias in Xenophon's *Memorabilia*)^d is examined, and it is maintained that the laws of the State are artificially imposed restrictions which are often directly opposed to the laws of nature. The

^a B13^b B44^c I 2 571^d IV, IV, 13

laws of the State should be obeyed before witnesses; but when one is alone, one should obey the edicts of Nature. The difference between the edicts of Law and of Nature is that the former are arrived at by agreement, the latter by inevitable growth; disobedience to the former is punished only if detected by their guardians, but disobedience to the latter is punished equally whether one is alone or in company. The penalty depends on no man's opinion, but follows in the nature of things. The majority of acts decreed to be just according to law are contrary to nature: there is legislation concerning what the eyes, ears, tongue must and must not see, hear, speak, what the hands must and must not do, where the feet must and must not go. But the prohibitions of law are no more in conformity with nature than their commands. Life and death belong to nature; life comes from what is advantageous, death from what is disadvantageous, but the advantages afforded by the laws are chains upon nature, whereas those that come from nature are free. True reasoning shows that the things which give pain do not benefit nature more than the things which give pleasure; the truly advantageous must not harm, but must benefit. Examples are then given to show that what is naturally advantageous is often opposed to the demands of law. for instance, the laws approve of those who act in self-defence and not in aggression, of those who care for their parents, even though the latter have treated them ill, and of those who permit others to swear an oath, and do not themselves swear.¹ Such behaviour however is opposed to nature: such acts offer the possibility of an unnecessary increase of suffering and decrease of pleasure. If the man who accommodated himself to these provisions received support from the laws, and the man who opposed them were penalized, obedience to the laws might not be without profit, but as things are, the law is not strong enough to help the sufferer and restrain the doer and, moreover, when the two come before the courts of justice, they are in the same position: the sufferer has to convince the court that he has suffered, and it is equally open to the defendant to deny the offence, so that the issue depends upon their relative ability to persuade, that is, on rhetorical technique.

¹ That is, who allow a case to be settled by accepting an oath sworn by the opposite party. See Aristot. *Rhet.* I, xv, 27 (1377a), and Bonner and Smith, *Administration of Justice from Homer to Aristotle*, Vol. II, pp. 146-159 (evidentiary oath).

After a few illegible lines the arguments proceed: those of high birth are honoured, those of low birth are not. This is a barbarian attitude. we are all made by nature the same in every way, so that all can recognize the natural necessities of life, and these are open to all to procure, in these respects there is no difference between barbarian and Greek. We all breathe into the air through mouth and nostrils . . . Here the manuscript breaks off.

Another extract in a different handwriting appears to come from the same book.^a ^{a1} This attacks another aspect of legal justice, namely the giving of true evidence, thought to be just and useful in men's dealings with one another. This however (he argues) is not just, for justice requires that one shall not wrong anyone who has done one no wrong. But a witness, even if truthful, is bound to 'wrong' a man who has not wronged him his evidence may cause its object to be condemned, and lose his money or his life. This 'wrong' is then returned, for the man who has been condemned will hate the witness who caused his condemnation by giving truthful evidence, and the witness is wronged not only by this hatred, but by the necessity he is under to be on his guard against the other man for the rest of his life. Similarly, to pass judgement, and to arbitrate, are not just, for some are helped, but some are harmed, that is, some are not wronged, but others are. So that if it is just to wrong someone who has not wronged you, the law is just; if not, the law is not just. Either both are just or both unjust.

The obvious fallacy lies in the equating of 'harming' someone with 'wronging' him, and shows Antiphon's affinity with the other Sophists, especially Hippias.¹

The second work attributed to Antiphon, the discourse *On Concord*, is highly praised by Philostratus for its brilliant apophthegms, dignified exposition and fluent style.^b The subject was a favourite with both philosophers and politicians during the late fifth and early fourth centuries. Democritus said that concord alone makes possible all great activities, including war;^c in the *Cleitophon*^d concord is praised as the only true and real form of friendship, that is, the concord dependent not on

^a B44 (II, p. 353)

^b B44a

^c 68B250

^d 409E

^{a1} Diels assigns it to a different book on the ground of the different handwriting and arrangement, but this is of less weight than the obvious connection of subject-matter and argument. Several hands may have been employed in simultaneous copying.

¹ Cp. Xen. *Mem.* IV, 14, Plato, *Hippias Major*, *Protag.* 337 C-D 399

similarity of opinion but on knowledge of the truth, which is the basis of all the sciences, including medicine. In the *Memorabilia*^a Socrates says that everywhere in Greece there is a law that the citizen shall preserve concord, not in matters of taste such as drama, music and poetry, but in obedience to the laws, since the prosperity of the State, as of the home, depends on such concord. The ideal of concord was used both by the Athenian democracy and its critics. It was the proposed subject of an Assembly called to settle the differences between the oligarchical government and the Patriots in 411 B.C.^b It was the theme of the oligarchical discourse written by Thrasy-machus,^c and it was also one of the watchwords of the restored democracy of 403 B.C.^d Later, Isocrates extolled it as the great virtue of the 'ancestral constitution' of Solon and Cleisthenes, welding together all classes in the State, especially the rich and poor.^e Aristotle stresses the political importance of concord in the *Ethics*, where it is shown that if friendship is present in a community there is no need of justice, so that lawgivers try to promote concord and banish faction.^f A passage in Iamblichus preserved by Stobaeus^g likens unity of purpose in the individual to concord in the home or the State, and a divided purpose to political faction.

It is against this background that the fragments of Antiphon's essay must be interpreted. The order in which they should be arranged is conjectural, but the essay seems to have begun with some general considerations on the nature of man, who is said to be the divinest of the animals.^h A survey of human civilization may have followed, with reference to the different ways of life of different tribes.^{i, j} Life in general is described as open to many complaints: it has nothing remarkable, great or noble, but all is petty, feeble, brief and mingled with sorrow.^{k, l} It is like a day-long watch, when having

^a IV, iv, 16 ^b Thuc VIII, 93 ^c 85B1 ^d Andoc *de Myst* 140, Lys XVIII, 17

^e *Arcop* VII, 31-5 ^f *Nic Eth* 1155 a22 ^g B44a, Stob II, 33, 15 ^h B48

ⁱ B45, B46, B47 ^j B51

^{k, l} Names of tribes Shadowket, Longheads, Dwellers Underground (Troglodytes). Hippias wrote a book *On the Nomenclature of Tribes* (86B2), there may be some connection.

^j This may not come from the essay *On Concord*, the address ω μ ακρίτε suggests a dialogue. The fragments or words definitely attributed to *On Concord* are B45-48, 63, 65, 67-71. Frgs 49-62 and 64, preserved by Stobaeus and the lexicographers, are assigned to the same book with probability because of their subject-matter. B66, 'the care of old age is like the care of children', is assigned by Clement to Antiphon the orator.

looked upon the light we yield our post to the next generation.^a It is therefore important to live life well: there are some who do not live the present life, but prepare with great diligence as if they were going to live another life, meanwhile their time runs out and is gone.^b But you cannot, if you make a mistake in life, go back and change it as if you were changing a move in a game of draughts.^c (The most important thing for mankind is education: if the beginning is right, so probably will the end be. We sow as we reap, a good education in a young person is like a crop which flourishes throughout his life and cannot be destroyed by adversity.^d

The business of education is to teach concord, external and internal.^e Nothing is worse for mankind than anarchy, therefore our ancestors instilled obedience into their children, so that when they grew up they might not be carried away by the great change of circumstance.^f The right surroundings must be provided: one's character becomes like that with which one spends the greater part of the day.^g The true order of things must be explained: when people learn it, they listen.^h

The chief cause of dissension is inequality of wealth. Therefore the rich must be encouraged to help their neighbours.ⁱ Miserliness when it is the result of hard work and suffering is understandable, saving is then a kind of pleasure, and (spending as painful as tearing off one's own flesh).^j But unless money is used, one might as well not possess it: a man who refused to lend money to a neighbour, but buried it, was robbed; the neighbour told him to give up fretting and bury a stone there instead, since he would be none the worse off.^k

The greatest cause of concord is friendship, friends, therefore, should be carefully chosen.^l Real friends should be recognized as such, not admirers of one's wealth and flatterers of one's good fortune.^m Friendships should be preserved: young friendships are close, but old friendships are closer.ⁿ

The attainment of inner concord, which means unity of purpose, is important for the individual. To hesitate where there is no place for hesitation^o is wrong. Fear is the great cause of hesitation: the coward is bold in speech concerning absent and future dangers, but hesitant when confronted with the fact.^p Sickness, as the proverb says, is a holiday for

^a B50^b B53a, B77^c B52^d B60^e B61^f B62^g B63^h cp 68B255ⁱ B52^j B54^k B65^l B64^m B55ⁿ B56

cowards: they need not then go into action.^a But there are times when fear is salutary, for instance if a man is setting out to harm his neighbour. Fear means hesitation, and hesitation gives an interval in which often his mind is deterred from its desires. He may realize that the deed once done is irrevocable, and that he may suffer retribution. Hopes are sometimes bad counsellors, leading men to disaster and a fate which they had thought to impose on others. The prudent man, and the best judge of prudence in others, is he who fortifies his soul against immediate pleasure and conquers himself to choose immediate gratification is to prefer the worse to the better.^b Moreover, true inner orderliness of soul cannot be achieved by one who has not desired or touched what is base and bad, for his good conduct is not the result of a victory over anything.^c

As for concord in the home, Antiphon seems to think that this is impossible even in the most favourable circumstances. Marriage in itself is a 'conflict',^d if the woman turns out to be incompatible, the disaster is irreparable. Divorce means the loss of valuable friends, and it is hard, when thinking to acquire pleasure, to bring home pain. If, however, the wife is compatible, no pleasure can be greater; but the pleasure itself is the possible source of pain. Pleasures do not come alone, but are attended by griefs and troubles. Further, all great pleasures, prizes and honours which God has given to men depend necessarily on great exertions. Marriage is like acquiring a second body in addition to one's own, which must be looked after, whereas one's own body is trouble enough already. Further, if children are born, then all is full of care, the youthful spring goes out of the mind, and the countenance changes.^e

Nothing more is left of *On Concord* except a few words preserved by the lexicographers.^f The relics of the *Statesman* are very meagre. There are references to 'disobedience to authority',^g 'a facility for combination',^h to extravagance, which he called 'breakfasting away one's own or one's friends' property',ⁱ and to the evils of a reputation for tippling.^j

No direct quotation survives from the *Interpretation of*

^a B₅₇^b B₅₈^c B₅₉^d B₄₉^e B₆₇-B₇₁^f B₇₂^g B₇₄^h B₇₃ⁱ B₇₆^j ἀγών

Dreams; we gather from Cicero that Antiphon's book was the basis of those by later authors, such as the Stoic Chrysippus, and later, Antipater.¹ A mass of trivial dreams was collected, and rules for their interpretation were laid down; by 'interpretation' was meant the determination of their prophetic significance, they are regarded as minor oracles.^a This interpretation, it was argued, is a science, and does not depend upon inspiration; the interpreter is to the dream or the oracle as the commentator is to a poem; the mantic art is merely 'the conjecture of a sensible man' ^c.^{d1} The actual interpretations, however, were open to the criticism that they were arbitrary, and Antiphon's claim to distinction in this art seems to have been rather that he rejected the obvious interpretation for one more recondite, or even opposite. A competitor at Olympia dreams that he is driving a four-horse chariot, the 'obvious' interpretation is that he will win, but Antiphon would say that he will lose, because 'four run before him'. Another competitor dreams that he was turned into an eagle, the 'obvious' interpretation says that he will win, because the eagle's flight is fastest, but Antiphon says that he will lose, because the eagle pursues other birds and so always comes last.^d To dream of a cuttle-fish means escape, because of the 'ink' it uses to cover its flight, Antiphon dealt with this dream, but whether he gave it this interpretation is not stated.^e He could sometimes give a rationalistic interpretation, if the jest about the hungry sow whose owner dreamt that it had eaten its litter is really his.^f He also dealt with bodily signs, such as the twitching of the eyelids, as omens; there is a hint that some of this lore was derived from Egypt.^g

Nothing is left of the treatise on the *Art of Freedom from Pain*, if it existed. It purported to give rules for the treatment of mental distress on the analogy of those given by medicine

^a A7^b B79^c A9^d B80^e B78^f A8^g B81a

^{d1} The author of the definition is given as Antiphon the tragedian, but was probably Antiphon the seer

¹ Chrysippus, born 280 B C at Soloi in Cilicia, was the son of Apollonius of Tarsus. Though not the founder of Stoicism, he was the first to establish its doctrines on a sound basis. Antipater, born 144 B C, was a native of Tarsus, disciple of Diogenes and teacher of Panactius. He wrote two books on divination, attempting to prove the truth of this science from the benevolence of the deity, and maintaining that dreams were intimations of the future. The opposite view had been clearly stated by Aristotle in a short treatise *On Divination by means of Dreams*. Cicero's prolix book *On Divination* contains many examples of alleged prophetic dreams.

for the sick; the patient was first of all relieved by speaking of his sorrow, and then 'treated' with consoling words, the technique being considered a branch of rhetoric. This profession was adopted by Antiphon in his youth, but later abandoned for rhetoric in the wider sense ^{a, a1}

A number of words and phrases are attributed to 'Antiphon' by the lexicographers; some are ordinary Attic words which could have been used by the orator,^b others are poetical or Ionic words which probably belong to the seer ^c It is possible, however, that some of the poetical words may have come from the tragedian

The portrait of 'Antiphon the Sophist' in the *Memorabilia*^d is a colourless caricature of a typical opponent of Socrates. He tries to rob Socrates of his disciples by pointing out Socrates' poverty-stricken way of life, and calling him a teacher of misery. Socrates replies that by not taking fees he is at liberty to talk to whom he pleases, his way of life is healthier than a more luxurious régime, and whereas Antiphon thinks that happiness depends on lavish expenditure, he thinks that the man nearest to the divine needs least. Antiphon attacks Socrates for charging no fees, because this proves that the knowledge he purveys is worth nothing. Socrates is honest but not wise. Socrates replies that an exchange of money can make a good thing bad, as when beauty is prostituted, he prefers to make friends of the gifted, and to share any treasures of knowledge he may discover. Antiphon asks Socrates why he thinks it right to make politicians of others while not practising politics himself, Socrates replies that it is better to train a large number of others to be good politicians than himself to become one. The conversation has nothing to do with the real Antiphon, and sheds no light on his views. It seems probable that Xenophon had never met Antiphon or read his works, but had merely heard of him as one of the rivals of Socrates in the education of the young men of Athens.

^a A6^b *Eg* B84, B88, B90, B102, B103, B107, B109, B110^c *Eg* B85, B89, B95, B97, B104, B116^d I, vi, 1 *sqq*^{a1} A6 here there is confusion by the authorities with Antiphon the orator and Antiphon the tragedian, but the seer must certainly be understood; see above, p. 393

88. CRITIAS

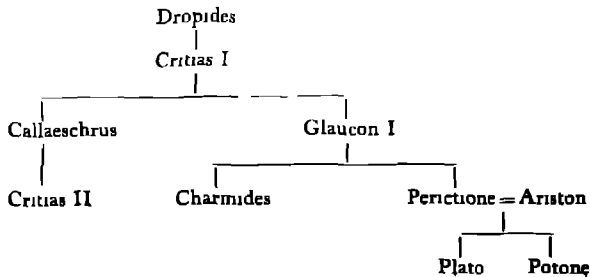
CRITIAS of ATHENS lived from between 460-50 B.C. to 403 B.C.

Critias was a great-grandson of Drôpides, the friend and relative of Solon.^{a, a1} He was related to Plato, whose mother Perictionê was his first cousin. The date of his birth was not known, but he was a friend and contemporary of Alcibiades (born about 450) and was present with him in the scene depicted in the *Protagoras*.^b He was therefore probably born between 460 and 450 B.C. He was killed in May 403 B.C. while fighting against Thrasybulus' party at Munychia.^c

Critias came of a great and wealthy family,^d and had the best available education. Plato gives a glimpse of him as a ten-year-old boy listening to the legends of Athenian greatness related by his grandfather Critias, then aged about ninety. We also hear that he had a talent for playing the flute, which he cultivated perhaps in imitation of the Spartans, and in which he acquired, like Callias, a reputation.^e When a young man he associated with Socrates, Xenophon, a hostile witness, says that like Alcibiades he did so merely to attain to superiority over his companions and train himself for a political career; when he had achieved this, he deserted Socrates. Socrates during their association tried to check his evil tendencies, and earned Critias' hatred by his censure of Critias' relationship

^a A₃, A₂^b j16A, j36D, E^c A12, A1^d Plat. *Charm.* 157E^e A₃

^{a1} Not the brother as Diogenes L. says. Diog. L. also mistakenly gives Glaucon I as Critias' brother, not, as Plato records, his uncle.



with Euthydemus.¹ This hatred found vent when Critias came into power in 403 B.C. and was appointed with Charicles to the task of remaking the laws; he then promulgated a decree forbidding the teaching of rhetoric, which was aimed at preventing Socrates from conversing with the young men of Athens.² These statements of Xenophon find no support in Plato's representations of the conversations between Critias and Socrates, though that of the *Charmides* is marked by some sophistic acerbity. It is unlikely that Plato's tenderness towards a relative would outweigh his attachment to Socrates: he would not have used Critias as a vehicle for the myths of the *Timaeus* and *Critias* if Critias had been violently hostile to Socrates.

Like Alcibiades, Critias was involved in the affair of the Hermæ: he was one of those denounced by Diocleides, and saved by the confession of Andocides, whose father Leôgoras was Critias' first cousin. Whether Critias went into exile on this occasion as well as later is not known. He was in Athens in 411 B.C., and was a leader of the pro-Spartan wing of the oligarchical government, which was active in fortifying Ætoneia at the mouth of the Peiræus.³ Nevertheless he did not lose the confidence of the people: after the fall of the Four Hundred it was he who proposed the resolution that the corpse of Phrynichus, the oligarchical leader murdered in 411 B.C., should be tried for treason, and if condemned thrown over the border.⁴ The reason for Critias' vengeance on the dead Phrynichus was doubtless the latter's hostility to Alcibiades,⁵ for whose return Critias was working, Alcibiades' recall was proposed by Critias immediately after the fall of the Four Hundred, and during the rule of the Five Thousand, in 411 B.C.,⁶ but Alcibiades did not actually return till 407. When in the same year he was again exiled, Critias also was banished by a vote of the Ecclesia,⁷ on the proposal of the popular leader Cleophon, who quoted against him some verses of Solon

¹ A4 ² A6, cp Thuc VIII, 90 ³ A7 ⁴ Thuc VIII, 48, 4, 50 sqq, 54, 3

⁵ Thuc VIII, 97, 3 ⁶ A10

⁷ Xenophon's attack may have been a counterblast to Plato's portrait of Socrates in the *Charmides*, cp 155D. Socrates is here represented as almost overcome by the physical charms of Charmides, who was Critias' cousin and ward, being the son of Glaucon I and the brother of Plato's mother Perictione. If this were taken literally by some, it would lead to charges which Xenophon in his *apologia* would be anxious to refute.

written for his grandfather Critias, bidding him obey his father: this advice, said the orator, proved that the family had always been lawless.^a Critias went to Thessaly, where he engaged in intrigues. Xenophon says that he there mixed with lawless men,^b and (in a speech attributed to Theramenes) that he joined with one Prometheus in an attempt to set up democracy in Thessaly, arming the serfs against their masters^{c, c1} His stay in Thessaly seems to have caused a deterioration in his character; at any rate he came back under the amnesty of 404 B C thirsting for revenge against the people who had sent him into exile, and a complete oligarch so far as the Athenian democracy was concerned. His known pro-Spartan sentiments caused him to be chosen as one of the five 'ephors' appointed as conveners of the citizens, leaders of the oligarchs and opponents of the democracy. These chose phylarchs¹ for the Tribes, and controlled the choice of all other officials, thus achieving complete domination of public affairs.^d

When the Thirty were elected, and Critias and Charicles were appointed to revise the constitution and recodify the laws,^e Critias gave free rein to his desire for revenge. Opposed by Theramenes in his demands for wholesale executions,^f he denounced him before the Boulê, Theramenes drank the hemlock.^g The Thirty, led by Critias, then plunged into a course of bloodshed and tyranny, they even pursued those whom they had driven into exile, by threatening with Spartan arms all cities which received them.^h After Thrasybulus' coup at Phyle, Critias and the rest of the Thirty, feeling insecure at Athens, seized Eleusis by a trick and prepared it as a stronghold. Thrasybulus then effected his landing at Peiraeus and retired to Munychia. The oligarchical forces attacked from Athens, in the struggle Critias, with another of the Thirty, Hippomachus, his cousin Charmides (now one of the ten archons) and about seventy of their followers, were killed.^h Critias' friends set up a tomb on which Oligarchy was represented as holding a torch and setting fire to Democracy, the

^a A8 ^b A4 ^c A10 ^d A11 ^e A4, A9 ^f A10 ^g A1 ^h A12, A1

^{c1} Other authorities, unable to believe that the Athenian oligarch would help democracy elsewhere, said that he worked to make the Thessalian oligarchies more oppressive (A1 = Philostratus *VS* I, 16)

¹ Or city guards. Shuckburgh, *Lysias, Orationes* XVI, note *ad loc* (XII, 43)

² His last gesture, 'Thus for the fair Critias', recalls Critias' interest in the game *Cottabos* (Xen. *Hell* II, iii, 56, B2)

inscription read: 'This is the monument of good men, who checked for a time the accursed Athenian democracy from its violence.'^a The authority does not state where the monument was erected.¹

The career, and with it the work, of Critias quickly fell into oblivion. by the time of Aristotle, Critias was only a name to the majority.^b Hatred of the Thirty obscured all else, and Critias was held up to execration by later writers (who based their accounts on those of Xenophon and Lysias) as the greatest villain who had ever lived.^c His corruption was sometimes attributed to the Thessalians, against whom Xenophon had a special grudge,^d and sometimes to Socrates. The portraits of Critias by Plato, however, do not bear out those of Xenophon in the *Memorabilia* and the *Hellenica*. Bearing in mind Plato's relationship to Critias, and his anti-democratic views, nevertheless one can hardly believe that he would have regarded Critias so leniently if he had been the bloodthirsty tyrant depicted by Xenophon.^e The truth about Critias' character can best be gathered from the remains of his writings.

Writings Critias wrote a considerable number of works in verse and prose. His verse works included a poem in hexameters on the poets,^f elegiacs on inventions,^g on *Constitutions*,^h and other subjects, experimental verses consisting of a dactylic hexameter followed by an iambic trimeter line,ⁱ and plays.^j He also wrote in prose on *Constitutions*,^k and his other prose works included *Conversations*,^l in two books, *Aphorisms*,^m in several books; *Preludes to Public Orations*;ⁿ a treatise on the *Nature of Love*, or *The Virtues*,^o and other speeches or essays which were extant till the second century A.D. but are now lost.

His style was greatly praised by later writers on rhetoric, he aimed at a lofty and authoritative manner, like Antiphon the Sophist,^p but was purer in diction and clearer in arrangement;

^a A 13^b A 14^c A 1, line 11^d B 1^e B 2^f B 6 A 22^g B 4^h B 10-B 29ⁱ B 30-B 38^j B 40-B 41a^k B 39^l A 19, B 43^m B 42ⁿ A 19, cp B 46, B 47, B 51

¹ The story may be based on the saying attributed to Dionysius, tyrant of Syracuse, that 'tyranny is a fine tomb' (Isocr. *Archidamus* 45). It was used of Critias also by those who defended him by saying that he had at least died nobly (Philostr. *V S* I, 16; A 1, line 28).

² Cp his portrait of Meno, *Anab.* II, vi, 21, again quite unsupported by Plato. See p. 355 above.

³ See pp. 405-6 above.

he aimed at directness rather than dramatic effect such as an affectation of honesty, simplicity and so forth, and avoided the appearance of a too obvious care.^a He owed to Gorgias his grandeur,^b and to Antiphon the orator his exactitude in argument;^c but his felicity of expression was his own. Like Lysias, he tended to use the speech customary in his time;^d and he was regarded as one of the canons of pure Attic dialect,^e though actually he used a judicious mixture, thereby enhancing his use of Attic. He was somewhat lacking in force, but had the sweetness and smoothness of a zephyr, Philostratus says.^f Though his writings fell into oblivion, so that their authorship was disputed, they found their admirers from time to time: Herodes Atticus singled Critias out for special admiration, and rescued his works from neglect.^g

Few of the extant fragments of his writings have any interest for philosophy. Of his poem in hexameters on the poets, some lines survive in praise of Anacreon,^h who had been a friend of his grandfather Critias,ⁱ and had praised the family in his poems.^j Anacreon is praised as the poet of pleasure, of love and feasting. Critias may also have written a prose work of literary criticism: a passage survives in which he censures the poet Archilochus for having given himself away as the son of a slave, poor, quarrelsome, an adulterer and a coward.^k Critias also wrote on Homer, saying that he was not the son of a mortal but miraculously begotten by a river-god.^l Of his elegiacs, one poem described the inventions attributed to the various people and cities: to Sicily the game *Cottabos* and the wagon, to Thessaly the throne, to Miletus and Chios the bed, to Tyre the goblet of gold and all household utensils of bronze, to Thebes the chariot-seat, to Caria the merchant ship, to Athens the potter's wheel and its products.^m To Orpheus is ascribed the invention of the dactylic hexameter.ⁿ Another poem written partly in elegiacs was his congratulatory address to Alcibiades on his restoration in 407 B.C.; in part of this poem the hexameters were replaced by iambs, as 'Alcibiades' could not be written in the dactylic metre.^o In this poem Critias proudly claimed to be the author of the proposal to invite Alcibiades to return.^p

^a A19^g A21^m B2^b A17^h B1ⁿ B3^c A16, 85A13ⁱ A2^o B4^d A18^j Plato, *Charm.* 157E^p B5^e A20, A17^k B44^f A1 *ad fin.*^l B50

Perhaps his best-known poem was the *Constitutions in Verse*, which finally came to be considered the only work he had written.^a The only surviving fragments come from the *Constitution of the Spartans*, and describe the abstemiousness of the Spartans in wine-drinking, as opposed to the heavy drinking of other peoples such as the Lydians. The Spartans do not pledge each other, passing the cup along to the right, but drink only what is before them, thus they preserve health and property, while enjoying moderate good cheer.^b The saying 'Nothing too much' is attributed to the Spartan Chilon,^c and it is suggested that virtue comes from habit rather than character.^d The corresponding prose work on *Constitutions* likewise praises the Spartan way of drinking as opposed to the Chian and Thasian, the Attic and the Thessalian.^e In this work Spartan ways are eulogized, from their system of physical training for men and women, which produces the best children,^f down to the smallest details of their daily life. Spartan shoes are the best, their cloaks the most comfortable to wear, their soldier's drinking-cup the most suitable, with its rim to catch impurities.^g Spartan household furniture is compared with the beds and tables of Miletus, Chios and Rhêneia.^h The ancient Spartan 'tong-dance' is described.ⁱ He also gives an account of the precautions taken by the Spartiates against the Helots, of whom they live in constant fear: nowhere is there a greater gulf between slave and free than at Sparta.^j Whether this is a criticism, or is meant to illustrate Spartan mastery, is not clear. One other quotation from the prose *Constitutions* concerns the Thessalians: they are the richest of the Greeks in their clothes and way of life, and so were responsible for the Persian invasion, as the Persians coveted their wealth.^k In a passage in the verse *Constitutions*, he expresses a wish for 'the wealth of the Scopadae, the magnanimity of Cimon, the victories of Arcesilas of Sparta'.^{l, 11}

The prose *Constitutions*, besides those on Sparta and Thessaly,

^a A22 ^b B6 ^c B7 ^d B9 ^e B33 ^f B32 ^g B34

^h B35 ⁱ B36, Athen XIV, 629d ^j B37 ^k B31 ^l B8

¹¹ Scopadae: a noble Thessalian family, opponents of the Aleuadae. Almost the whole family was killed in 515 B.C. by the falling of the roof of their banquet hall, Simonides who was present escaped, and wrote a dirge on this disaster (Frg. 32). A descendant of a survivor, Scopas the Younger, lived in the late fifth century (Ael. V.H. XII, 1). Arcesilas of Sparta, famous for victories in the chariot-race at Olympia (Thuc. V, 50, 4, 76, 3, VIII, 39, 2. Plut. Cim. X. Paus. VI, 2).

included one on Athens.^a Of this no specific quotation survives, though a number of scattered references to Athenian statesmen may have come from this work. Cimon is again praised for having persuaded the Athenian people to send help to Sparta after the earthquake in 468 B.C., when the democratic leader Ephialtes took the opposite view that they should let their enemy remain in the dust.^b Other leaders such as Themistocles and Cleon are said to have entered politics with little or nothing, and amassed large fortunes while in power.^c He may also have described the numerous trades plied in the Athenian market-place: dealers in clothes,^d lyre-strings,^e brass, iron, vegetables, cheese, emetics, tow, wool, incense, roots, silphium, green-groceries, utensils, pots, drugs, weapons, pictures, birds,^f perfumiers,^g seal-ring carvers,^h hair-net makers,ⁱ seed-gatherers, seedsmen,^j the fish-market.^k The Athenian jury-system^l seems to have been discussed, and other features of the busy city life,^m doubtless as opposed to Spartan simplicity.

Four plays formerly attributed to Euripides — a trilogy and a satyric play — are now attributed to Critias.¹ The first three — *Tennês*, *Rhadamanthys*, *Peirithôos* — were stigmatized as spurious (that is, not by Euripides) in an anonymous *Life of Euripides*,ⁿ and Athenaeus, quoting a line from the *Peirithoos*, speaks of 'the author, whether Critias the tyrant or Euripides'.^o The satyric play, *Sisyphus*, was attributed to Critias by Sextus, and to Euripides by Aëtius.^p On these grounds, as well as on grounds of style, it is considered that this tetralogy was in all probability the work of Critias, although those who quote fragments from these plays usually attribute them to Euripides.

Tennes was the eponymous hero of Tenedos,^q nothing remains of the play except the single line 'Alas! Nothing is just in the present generation'.^r

Of the *Rhadamanthys* only one fragment of importance survives. the speaker (probably Rhadamanthys) says that men have many desires, some for high birth, some for money, some for the gift of persuading others to evil courses, but that his

^a B30 ^b B52, Thuc I, 100 sqq ^c B45 ^d B64, cp B65, B38 ^e B67

^f B70 ^g B68 ^h B66 ⁱ B69 ^j B70 ^k B60 ^l B71; B61

^m B72, B73 ⁿ B10 ^o B17 ^p B25 ^q B11, B12

¹ Wilamowitz, *N. Jahrbuch*, 11 (1908) 57, *Analecta Euripidea*, p. 166 sqq, *Hermes* 62 (1927) 291 sqq

² G. Norwood, *Greek Tragedy*, pp. 29, 30

own wish is for glory ^{a, a1} The end of the hypothesis of this play has been recovered from a papyrus found at Oxyrhynchus.^b

Of the *Peirithoos* a portion of the Prologue, and of an episode, have been recovered from Oxyrhynchus papyri. The Prologue concerns Peirithoos' father Ixion, his sin and punishment;¹ the episode gives a conversation between Theseus and Heracles.^c The fragments quoted by ancient authors include a remarkable passage on Time — 'unwearying, full, with everflowing stream, self-begetting' — and the Twin Bears with swiftly-moving wings, who guard the Pole of Atlas.^d Another passage apostrophizes the Creator: 'self-made, who hast woven the nature of all things in the aetherial whirl, round whom light, and dusky shimmering night, and the innumerable throng of the stars, for ever dance'^e Other fragments give a conversation between Aeacus and Heracles in Hades,^f and several truisms, on Fortune ally of the prudent,^g on honour,^h on life,ⁱ and on the good character, which is stronger than law in that it cannot be overthrown by any orator.^j

The longest and most interesting fragment comes from the *Sisyphus* this gives a purely rationalistic explanation of the origin of religion, which he places after the origin of Justice and Law, Law could prevent only crimes done openly, religion was devised to check those done in secret, and was invented by a wise and clever man, who dragged in Divinity, saying that there was a God, immortal, omniscient, and caring about virtue. This man declared that the gods dwell in the heavens, whence come lightning and thunder, where are the stars, 'the beautiful embroidery of Time the skilled craftsman', and the sun and the rain, thus surrounding them with awe. By imparting fears to mankind and establishing a deity with sound argument and in a suitable abode, he quenched lawlessness among men.^k

From unspecified dramas a few fragments remain on Time,^l Conceit,^m a comparison between rich stupidity and wise poverty as companions in the house,ⁿ and the mistake of grati-

^a B15 ^b Diels *Vors* II, p. 425 ^c B15a, *Vors* pp. 425-6 ^d B18 ^e B19

^f B16 ^g B21 ^h B20 ⁱ B23 ^j B22 ^k B25, cp. *Xen. Mem.* I, iv, 18

^l B26 ^m B28 ⁿ B29

^{a1} Eur. *Frg.* 865 'Fame shows the good man even in the hollows of the earth', has been attributed by Welcher to the *Peirithoos* (B24)

¹ Cp. *Hom. Il.* XIV, 317-399, *Pind. Pyth.* II, *Aesch. Eum.* 441, 718.

fyng one's friends' desires, thus giving immediate pleasure but earning future enmity.^a

From the *Aphorisms* and the *Conversations*, several quotations remain, showing that Critias emphasized the opposition between Mind and the sense-perceptions.^b From a treatise on Love, or the Virtues, comes a description of irritability of temper, probably from this book also comes the remark that beauty of form in men is the feminine, in women the opposite.^c From an unspecified prose book comes a sentiment of extreme pessimism. nothing is certain except that having been born we die, and that in our lives we cannot escape from folly.^d In the *Charmides* the definition of Moderation as 'minding one's own business' is attributed to Critias, who is most unwilling to admit to the authorship.^e

Critias is said to have accepted the view that the soul is blood. perception is most germane to the soul, and arises from the nature of the blood. In this he was probably following Empedocles.^f

The impression of Critias gained from his writings¹ is that he was a man of the world, with conventional aristocratic ideas on high birth, wealth, honour, that he himself had a lively enjoyment of the good things of life, and was more interested in objects than in theories. His admiration of Spartan moderation, and his detestation of self-indulgence, especially drunkenness, was due rather to his love of physical perfection and mental alertness than to any abstract interest in the virtues. He had considerable gifts as a poet, but the epigram recorded by Proclus, that he was called 'an amateur among philosophers, a philosopher among amateurs'^g is borne out by all that remains of his work, and also by the portraits in Plato. Critias' later degeneration into a tyrant was the fruit of his dislike of the Athenian democracy, of which he saw the worst side, and of his desire to avenge the insult of banishment.

^a B27 \^b B39, B40^c B48^d B49^e B41a, *Charm* 161B, 162A^f A23, 31B105, 3^g A3, Procl I, 70, 20 sqq

¹ There is little warrant for Boeckh's theory that the pseudo-Xenophontic treatise *De Republ Ath* is by Critias (B71), or that Critias was δ Γλαυκωνος ἑραστῆς, who wrote verses in praise of 'the sons of Ariston' (Glaucon and Adeimantus, Plato's brothers, Critias' cousins), Plato, *Republ* 368A

89 THE ANONYMOUS WRITER QUOTED BY IAMBLICHUS

IN Iamblichus' essay *Protrepticus* (Exhortation to Philosophy) a long extract is quoted from an ethical-political essay believed to belong to the period of the Peloponnesian War. Though the style is literary Attic, and the questions discussed are those common in intellectual circles of the era of the Sophists, the essay cannot be assigned to any author. It has little merit, being trite, laboured and lacking in any touch of inspiration or originality. It reads like the careful essay of a student, and falls far below the standard, both literary and philosophical, of any of the known writers of the day. The following is a brief summary of its contents

1. p. 95, 13 Success in any sphere (wisdom, courage, eloquence, virtue) depends on several factors first, natural endowment, which is a matter of chance, and others which are within our control, namely, desire for the good, industry, and early start and long pursuit of the chosen subject. If any of these is absent, complete success is impossible, if all are present, nothing is out of reach

2 p. 96, 1 The early start and assiduous effort are necessary because fame can only be built up over a long time. Time breeds in others confidence in one, and overcomes their envy. Men do not accord praise readily, but in the end can be forced by the compulsion of facts to praise even against their will, they cease to wonder if a man is really what he seems, or is merely pursuing reputation and deceiving them Rhetoric can be mastered in a short time from a teacher, but the virtue built up of many acts cannot be brought to its goal if begun late or briefly practised, it is achieved by long association, by refraining from all evil deeds, works, and ways, and by practising the reverse over a long period Further, men do not readily accept eminence suddenly acquired, either in wealth, wisdom or courage

3 p. 97, 16 If anyone achieve his object, he must use his success for good and lawful purposes, if he uses it for unjust purposes, it becomes a curse If he does the former, he will become completely good, but if the latter, completely bad. He who desires complete virtue must study by what theory and practice he can attain it, he will then be most useful to the

most people. Liberality with money has its disadvantages: either one must collect the money again and so do harm; or if one does not, one becomes poor, for it is not possible to accumulate enough to go round. But support given to the laws and justice has no such consequences: this is what unites States and men, and it is a gift that does not fail.

4 p. 98, 17. Self-control must be practised assiduously; one can achieve this by being superior to money, the great corruptor, and lavish of one's soul in the pursuit of justice and virtue. Most men are uncontrolled in these two respects, for the following reasons: they love their soul, for that is life, so they are sparing of their soul. They love money, because of their fears, of disease, old age, sudden losses, not so much losses inflicted by law, for these can be guarded against, but losses due to fires, the deaths of slaves and cattle, and other mishaps to body, soul or property. Other reasons for the desire to make money are: ambitions, emulations, and the desire for positions of power, to the attainment of which money contributes. But the truly good man seeks reputation not by means of extraneous adornment but by his own virtue.

5 p. 99, 18. Love of life might be excused if a man by avoiding death at the hands of another could be ageless and immortal. But since life if prolonged leads to old age, that is, an inferior state, not immortality, it is great ignorance and the habit of thinking and desiring what is bad to prefer this state coupled with dishonour rather than immortal fame.

6 p. 100, 5. Further, one must not seek aggrandizement, nor must strength if used for aggrandisement be regarded as virtue, while obedience to law is considered cowardice. Such a notion is the source of all that is opposed to the good. Men cannot live as individuals; they are united through necessity; and when they are in communities, they cannot live in lawlessness, for this would be worse than separate existence. Hence law and justice are men's rulers, and this can never be changed, being fixed by natural laws. If a man were so constituted that he were immune from wounds and disease, and were a superman unconquerable in body and soul, one might think perhaps that his power for aggrandizement would be sufficient, but this would be a mistake. Even such a man could be preserved only by allying himself with justice and law, and using his power for these and auxiliary ends, for the whole human race

would unite in enmity against such a character because of their own obedience to law, and their mass would prove superior to him and would conquer him

7. p 101, 11. It is necessary to study the advantages of obedience to law, and the disadvantages of lawlessness. The advantages of the former are mutual trust, which leads to the sharing of property, so that even a small amount suffices, whereas without it even a large amount will not. Prosperity and adversity are assisted by law. the former can be enjoyed without disturbance, the latter aided by the more fortunate Time, under law, is unproductive of intrigues, productive of works necessary to life. Men are freed from the most unpleasant thoughts, and endowed with the most pleasant, for intrigues give the former, creative work the latter. They can go to sleep without fear, and wake up likewise, with thoughts free from anxiety, ready for the work of the day, and lightening their labours with optimistic thoughts War, producer of the greatest evils, bringing disaster and slavery, is undertaken rather by the lawless than by the law-abiding The opposite is true of lawlessness. men busy themselves with intrigues, not work, they hoard money through mistrust and do not share it, so that scarcity prevails Prosperity is insecure, adversity is increased External war and internal strife arise, the latter through continual intrigues and counter-intrigues. Awake, one's thoughts are unpleasant, sleep and waking alike are full of fears. Tyranny, that great evil, arises from lawlessness Some wrongly believe that men are deprived of their freedom not by their own fault but by the power of the established tyrant, monarch and tyrant are established through lawlessness and aggrandizement. This comes about when all men have turned their hands to evil, men cannot live without laws and justice, and when these fail, the government falls into the hands of one man. How else could the rule of one man come about if law, which is the advantage of the people, were not expelled? A man who would rob the people of their law would have to be made of iron, if he, being one, were to succeed against so many, but being flesh and like other men, he could not do so. Only by establishing the opposite (to law, that is, lawlessness) can he become sole ruler. And so his very genesis escapes the notice of some men

90. TWOFOLD ARGUMENTS (DEBATES)

THIS work has no title or author's name; its date is after the end of the Peloponnesian War, as the author implies.^a It is written in a literary Doric, the exact provenance of which is not known,¹ and is an exercise in demonstrating that there are two sides to every question, as Protagoras taught.^b The author shows little originality, and appears to be repeating arguments and examples used by others, especially Heracleitus, Protagoras and Plato. A mnemonic theory, doubtless that of Hippias, is recommended.^c Examples of national customs are derived from Herodotus. The work is superficial and casuistic, an example of the kind of instruction for which the Sophists became notorious and were satirized by Aristophanes and Plato.

1. The first chapter applies the method of the twofold argument to good and bad.^d Some say that they are different, others that they are the same,^e differing only in relation to the subject and the occasion.

The latter proposition is taken first: examples are given, showing that good and bad are relative terms. Certain things such as food, drink,^f sexual intercourse, are bad for those that are sick, good for the healthy when they need them. Self-indulgence is bad for the self-indulgent, but good for the tradesman. Death, disease, shipwreck are ills for those who suffer them, but good for the undertaker, doctor, shipbuilder. In contests, athletic, musical and warlike, victory is a good for the victor, an ill for the vanquished.

The opposite proposition is that good and bad are different in fact as in name. They cannot be the same, because then to do good to parents would be to do ill, to do ill to enemies would be to do good, the King of Persia would be no better off than beggars. Food, drink, sexual intercourse would be both good and bad for the sick, and so on. In this section the ques-

^a 1 §8 ^b 80B6a ^c 9 ^d 22B58 ^e cp 22B61

¹ Not necessarily as early as 400 B.C., the date accepted by Diels. The reading is doubtful, but the most probable conjecture is τὰ νεώτατα, this would mean 'I give the most recent example first', not necessarily that 'the most recent example' had only just occurred. It is hard to believe that the work was not written after the publication of *Protagoras*, *Meno*, *Phaedo*, *Phaedrus* and *Theaetetus*, all of which, whatever their exact date, are later than 399 B.C.

¹ Diels points to the otherwise unknown ending -οὐντι for the dat. plur. masc.

² ἐπὶ ἀγαθῷ καὶ κακῷ

tion-and-answer method is used, and the argument finished inconclusively: the speaker says 'I do not say what good is, I am merely trying to prove that they are not the same'.

2. The second 'twofold argument' deals with good and bad in the sense of honourable and dishonourable.¹ The two propositions are as before that they are different; and that they are the same.

The second proposition is taken first, and the relativity of what is honourable is shown by examples. It is right for a beautiful boy to gratify a lover, but not a non-lover.^a Women may bathe indoors but not in the *palaestra*, men may bathe in public also. Sexual intercourse in private is right, in public wrong; men and women may have intercourse with their married partners, but not with others. It is right for a woman to adorn herself with cosmetics and jewellery, wrong for a man. To treat friends well is right, to treat enemies well is wrong;^b to kill friends and fellow-citizens is wrong, to kill enemies is right. Different States and peoples have different ideas of what is honourable and shameful. Spartan girls may exercise stripped, Ionian girls may not, Spartans need not learn music and letters,^c Ionians should understand all these things. Thessalians may catch and train horses, or catch, kill, flay and cut up oxen, in Sicily this is the work of slaves. Macedonian girls are allowed to have lovers before marriage but not afterwards, for (true) Greeks both are wrong. For Thracian girls, tattooing is an adornment,^d for other peoples, it is a punishment for crime. The Scythian thinks it right, having killed an enemy, to scalp him and carry the scalp in front of his horse, he covers the skull with gold or silver and uses it as a drinking-cup,^e Greeks would not enter under the same roof with one who had done such things. The Massagetae cut up and eat their parents;^f if a Greek did this, he would be put to death. Persians think it right for men to adorn themselves like women, and to have intercourse with daughter, mother or sister; Greeks think this unlawful. Lydians marry girls who have been prostitutes,^g no Greek would do so. In Egypt the men weave and work wool;^h in Greece the women. In Egypt they knead clay with the hands, bread with the feet.ⁱ Finally, if

^a cp *Phaedr.* 230E sqq

^b cp *Meno* 71E

^c But cp 88A15

^d Hdt V, 6

^e Hdt IV, 64, 65

^f Hdt I, 216

^g Hdt I, 94

^h Hdt II, 35

ⁱ Hdt II, 36

¹ Περὶ καλῶς καὶ αἰσχρῶς

one bade all men collect into a heap all the things which each group thinks wrong, and again bade them pick out from the heap everything that any group thinks right, nothing would be left over. The argument ends with a verse quotation: nothing is absolutely right or wrong, but the occasion decides, so that honourable and dishonourable are the same.

The opposite argument, that they are different, is as follows. whoever says that right and wrong are the same must admit that if ever he has done anything right, it was also wrong. A handsome man is also ugly, a white man is also black. It is right to honour the gods, and also wrong, right for a woman to adorn herself, also wrong. In Sparta it is right and wrong for the girls to strip for exercise, and so on. Finally, if all things considered wrong were collected into a heap, and men were ordered to take away what they thought right, all things thus taken away would be right for those who took them. The wrong things will not become right, any more than if one brought a horse or sheep or ox one would take away something different. If one brought gold or silver one would not take away brass or lead. So, in place of the 'wrong' one brought, one would take a 'right', the right and wrong things would not become the same thereby. To call in the evidence of poetry is no argument: poets write to give enjoyment, not truth.

3 The third 'twofold argument' deals with right and wrong in the sense of just and unjust.¹ It is maintained that they are different, and that they are the same.

First, the proof that they are the same. Lying and deceit are right towards enemies in time of war, it is right to deceive parents who refuse medicine, by putting it into their food. Violence towards and theft from relatives and friends is right if one of them is about to attack you with a sword. You may break into the house of a citizen, if your father is imprisoned there and is in danger of his life. Perjury is right towards enemies. Temple-robbery may be justified if Greece is in danger and money is needed to save her from the barbarian invader: this applies only to the temples which are the common property of Hellas — Delphi and Olympia — not to those which belong to individual States. To kill one's nearest and dearest may be right, as in the cases of Orestes and Alcmaeon, acting under orders from the oracle. In the arts, whoever best

¹ Περὶ δικαιοῦ καὶ ἀδικοῦ cp. 22B102

deceives in tragedy and painting is the best artist. Quotations from Cleobulina and Aeschylus are added, showing that lying, deceit and theft may be right. Hence just and unjust (or honest and dishonest) are the same, varying according to circumstance.

The opposite argument, that they are different, is as before: if they are the same, then to do what is right is to do what is wrong, and vice versa, a just man is also unjust, and a criminal worthy of death for his crimes has done righteous deeds, to steal the enemy's goods is both right and wrong. Justice and injustice do not enter into the arts. Poetry cannot be used in evidence, being written for pleasure, not truth.

4. The fourth 'twofold argument' deals with true and false that they are the same, and that they are different.

First, that they are the same: the same story is true or false according to whether it corresponds with the facts. An accusation of temple-robbery may be true or false, so too the statement for the defence. If all present make the same statement, 'I am an initiate', it is true for one only, who actually is initiated. So that the same words when falsehood is present are false, and when truth is present are true (just as a person is the same whether boy, youth, man or old man).

The opposite argument, that they are different, is: if those who maintain that true and false are the same are asked whether their own argument is true or false, and if they reply 'false', then they admit that true and false are different, if they say 'true', then by their own hypothesis the same argument is also false. A true piece of evidence is also false, a truthful man is a liar. According to them, if the things stated have actually happened, the story is true, if not, it is false. But the jury are examining, not the events (for they were not present) but the stories told of the events, so that the stories themselves differ according to whether truth or falsehood is mingled with them. (So the true and false tale are different.)

5. The fifth 'twofold argument' is that madmen and sane, wise and ignorant, say and do the same things, and that they do not.

On the former proposition: Both give the same names to things: earth, man, horse, fire, and the rest. They do the same things: sit, eat, drink, lie down. All things are and are not.^a

the same thing is bigger and smaller,^a more and less, heavier and lighter, a talent is heavier than a mina, lighter than two talents. The same man is alive and not alive; things here are not in Libya, and so on.

The opposite proposition 'it is not true that mad and sane, wise and ignorant, do and say the same things. Madness differs from sanity, wisdom from ignorance, this is clear from their actions. So that if these actions are the same, the wise are mad and the mad are wise and all is confusion. The wise say what they say on the right occasion, the mad say the same things on the wrong occasion, this small point alters everything. As proof that a very small change can make a great difference, examples are given of a change of accent or quantity in a word, or a transposition of letters, making a great difference in the meaning. If anything be added or subtracted, as when one takes 1 from 10, or adds 1 to 10, the difference is even greater. So that the qualification 'on the right occasion' makes all the difference between the sayings and doings of mad and sane, wise and ignorant. As for the argument that the same man both is and is not: the question to ask is, does this relate to the part or the whole? They are not the same.

6 On wisdom and virtue can they be taught?

The theory that wisdom and virtue cannot be taught or learnt is neither new nor true^b. The twofold arguments are as follows

Affirmative. wisdom and virtue cannot be taught or learnt. First. if you give something to someone, you cannot have it. Second. if it were teachable, there would be teachers, as of music^c. Third. the wise men of Greece would have taught their friends the same art. Fourth. some have studied under professional teachers (Sophists) and not been improved. Fifth. many who have not had teachers have proved meritorious.

Negative. the first argument is foolish, teachers do actually teach letters and music and yet retain their own knowledge. Second. what else do the Sophists teach if not wisdom and virtue?^d Anaxagoras and Pythagoras have their disciples. Third. Polycleitus taught his son sculpture. If anyone has failed to impart his knowledge, this proves nothing, but if anyone has succeeded, this proves that the subject is teachable.

^a cp Plat *Phaed* 102B-D

^b cp Plat *Protog* 319A sqq, *Meno* 87B sqq.

^c *Meno*, 89E sqq

^d *Meno* 91B

Fourth: many who study letters do not learn. Fifth: natural endowment makes it possible for some who have had no teacher to pick up knowledge readily elsewhere, perhaps from father or mother. One can pick up knowledge such as the names of things without knowing who was one's teacher; a Greek child reared in Persia will speak Persian, and if brought to Greece, will speak Greek.

The speaker on the negative side ends. 'This is my argument, beginning, end and middle. I do not say that virtue and wisdom are teachable, but only that the arguments advanced do not satisfy me.'

7. On lot. should all offices be awarded by lot, as some of the democratic orators say?

Only the negative side is given. The opponent is asked, Why do you not assign tasks to your slaves by lot, and let the driver cook and the cook drive? Why do we not compel smiths, cobblers, carpenters to follow the trade decreed by lot? In competitions, why is the flautist not compelled to play the harp, the harpist to play the flute, in war, the archers and hoplites to be cavalry and vice versa, so that all will be doing what they neither understand nor are able to do? The other side say that the lot is beneficial and democratic, this is not so. There are men in the State who are hostile to democracy and will overthrow the People if the lot so falls. The People itself should choose those loyal to it, and select suitable men as generals, magistrates and so on.

8. Proposition: it belongs to the same man and the same art to be able to converse in the brief style,^a and understand the truth about affairs, to pass correct judgement, to be a public speaker, to understand the art of rhetoric, and to teach concerning the nature and origin of the universe.^b

Only the affirmative arguments are given, and these are somewhat disconnected. First, the man who understands the nature of the universe will be able to give correct teaching and advise the community best on everything. Second, he who understands rhetoric will know how to speak correctly on everything, for if anyone is to speak well, he must speak on what he knows, therefore he will know about everything. He knows the arts of all kinds of speech, and these cover all existing things. Further, he who wishes to speak correctly must

^a *Protag.* 334E 599

^b cp 75 B1, see above, p. 336

understand the matters on which he speaks, and must correctly instruct the community to do what is good, and prevent them from doing what is bad. Knowing the correct course, he will also know the opposite; for the latter belongs to the same section of the whole, and he will always do the proper thing in regard to the same necessity if he is called upon. If he knows how to play the flute, he will always be able to do so if required. Further, the man who is to pass correct judgement must understand what is just, he will also know the opposite. He must also know all the laws, if he does not understand public affairs, he will not know the laws. The man who understands music knows the laws of music, he who does not know music will not know its laws either.

Further, whoever knows the truth about affairs knows everything, and so he can converse briefly, and if necessary give answers to questions, on everything, therefore he must know everything.

9. On memory. The greatest and finest discovery is memory, useful for everything, for knowledge and for life. The following are the rules for memorizing.

First, attend closely: the mind will thus penetrate the subject and perceive better.

Second, practise what you hear. Listening often to the same things and repeating them causes what you have learnt to pass as a whole into the memory.

Third, if you hear anything new, associate it with what you know. The names 'Chrysippus' and 'Pyrilampês' can be remembered by associating them with their component parts.¹ Activities can be associated with their patron gods or heroes: courage with Ares and Achilles, bronze-working with Hephaestus, cowardice with Epeius.

The manuscript here breaks off.

¹ Χρυσίππος with χρυσός and ἵππος, Πυριλάμπης with πῦρ and λάμπειν.

LIST OF AUTHORITIES

LIST OF AUTHORITIES

This list contains, with a few exceptions, the names given in Diels, *Fragmente der Vorsokratiker, Stellenregister*, Vol III, pp 568-651. The note on each writer gives, where possible, his place of origin, his approximate date, and his principal works

- ACHILLÊS STATIUS** or **TATIUS**, of Byzantium, 2nd or 3rd century A D
Wrote *On the Sphere*, of which a fragment called *Introduction* (*Isagôgê*) to the 'Phaenomena' of Aratus is preserved (Not to be confused with Achilles Tattius of Alexandria, 5th century A D, novelist)
- AELIAN** (CLAUDIUS AELIANUS, 'Sophista'), born at Praeneste in Italy, lived and taught rhetoric at Rome, 2nd century A D. Wrote in Greek. Two works are preserved *Varia Historia*, a collection of anecdotes taken from other writers often without acknowledgment, and *De Animalium Natura*, also a compilation from other writers, but with observations of his own
- AELIUS PROMÔTUS** of Alexandria, date uncertain, wrote medical works
- AETIUS** (Medicus) born at Amida in Mesopotamia, lived at end of 5th or beginning of 6th century A D. Wrote sixteen books on Medicine, a valuable and critical compilation from many medical writers now lost
- AETIUS** the Doxographer, author of a philosophical compilation mentioned by Theodoret, date later than the 4th century B.C. (See Diels, *Doxographi Graeci*, and Burnet, *EGP*, pp 34-5)
- AGATHÊMERUS**, probably early 3rd century A D. Wrote an Outline of Geography, (extant) a compilation from Ptolemy and other geographical writers
- AKIKAROS** (AKICHAROS, ACHAIKAROS), Chaldean sage, mentioned in Book of Tobit and by Strabo, subject of dialogue (lost) by Theophrastus. His sayings began to reach Greece in 4th century B.C. An Aramaic version of these was discovered at Elephantinê in 1912
- ALBERTUS MAGNUS** of Cologne, 13th century A D. Scholastic philosopher, teacher of Thomas Aquinas. Wrote paraphrases of all the works of Aristotle. Had considerable knowledge of the sciences, and wove together Aristotelian, Arabian, Jewish, Neo-Platonic and Augustinian teachings
- ALCIPAMAS** of Elaea in Aeolis (Asia Minor). Greek rhetorician, pupil of Gorgias, lived in Athens between 432 and 411 B.C.
- ALCIMUS**, flor. c. 300 B.C., probably of Sicily, author of a work *Against Amyntas*, quoted by Diog. L., who called him the most distinguished of all Greek rhetoricians.

- ALEXANDER OF AETOLIA, Greek poet and grammarian, lived under Ptolemy Philadelphus at Alexandria (285-47 B C)
- ALEXANDER of Aphrodisias in Caria, end of 2nd and early 3rd centuries A D. Surnamed *Exêgêtês* because of his fame as an interpreter of Aristotle
- ALEXANDER CORNÉLIUS, surnamed Polyhistôr ('very learned'), Greek writer living in Rome, 1st century B C., contemporary of Sulla. Famed for great learning and voluminous writing on history and geography. Probably the author of a work called *Successions of the Philosophers*, on the handing down of philosophical teachings; and also a treatise on the Pythagoreans
- ALEXANDER of Myndus in Caria, date uncertain, wrote on zoology, and perhaps a work on Myths
- ALEXIS, Athenian comic poet, 4th century B C., uncle and tutor of Menander
- ALEXIS or ALEXINUS, mentioned by Athenaeus as author of a treatise *On Self-Sufficiency*, otherwise unknown
- AMEPSIAS, Athenian comic poet, 5th century B C., contemporary of Aristophanes
- AMMIANUS MARCELLINUS, Greek by birth, Roman soldier, 4th century A D. Wrote in Latin a history of Rome from 96 A D to 378 A D., preserving important material
- AMMŌNIUS, son of Hermeias, 5th-6th centuries A D., studied at Athens under Proclus, teacher of Simplicius. Wrote Greek commentaries on Plato, Ptolemy and Aristotle, most of which are lost
- ANATOLIUS of Alexandria, Bishop of Laodicea, 3rd century A D., author of a work on Arithmetic, fragments of which are preserved
- ANATOLIUS, Vindonius, of Berytus, 4th-5th centuries A D. Author of a compilation on Agriculture, in twelve books, from this a Byzantine editor of the 10th century built up a compilation in twenty books, which has come down to us under the title *Geoponica*
- ANAXIMANDER the Younger of Miletus, lived in the time of Artaxerxes II, first half of 4th century B C., historian, wrote *Exegesis of Pythagorean Allegorical Precepts* (lost). On this was based a similar work by Androcydes, a physician of the time of Alexander the Great, called *On the Pythagorean Allegorical Precepts*, which in turn was used by Diogenes L., Demetrius Byz., Nicomedes and others
- ANDOCIDÊS, one of the Ten Attic Orators, 5th century B C
- ANDRŌN of Ephesus, date uncertain, wrote a work on the Seven Sages, perhaps entitled *The Tripod*
- ANDRŌN of Teos or Halicarnassus, date uncertain, earlier than the 2nd century A D., Greek historian; wrote *Family Relationships*.
- ANDROTĪŌN, author of a work on the history of Attica, probably not the Athenian orator attacked by Demosthenes

- ANTAGORAS of Rhodes, 3rd century B.C., wrote an epic poem *Thebais*, and epigrams quoted by Diog. L.
- ANTHOLOGIA PALATINA, an Anthology compiled by Constantinus Cephalas (probably 10th century A.D.) under the Byzantine Emperor Constantinus Porphyrogenitus, nothing is known of the author. The MS. was discovered in 1601 by the French scholar Saumaise (Salmasius) in the Library of the Electors Palatine at Heidelberg, and with the rest of the Library was later removed to the Vatican. This Anthology, which was the first since that of Meleager to draw on new sources, superseded on its discovery the Anthology of Maximus Planudes, the most complete known before that time.
- ANTIGONUS of Carystus, 3rd century B.C., wrote *Historiae Mirabiles*, anecdotes in Greek taken from other writers.
- ANTIPATER of Tarsus, 2nd century B.C. Stoic philosopher, lived at Athens. Disciple of Diogenes of Babylon, and teacher of Panaetius. Wrote books *On the Gods*, *On Divination*, and *On Superstition*.
- ANTIPHANÊS, Athenian comic poet, 4th century B.C.
- ANTISTHENÊS of Rhodes, *flor.* c. 200 B.C., wrote a History of his own times, praised by Polybius.
- ANTÔNIOUS 'Melissa', Greek monk, date uncertain. May be 8th or 12th century A.D. Compiled *loci communes*, sentences on virtues and vices, from the early Christian fathers, printed at end of early editions of Stobaeus.
- APOLLODÔRUS of Athens, Greek grammarian, 2nd century B.C. Wrote *Chronica*, a chronicle in iambic verse dealing with history from the fall of Troy to his own time (143 B.C.). May also have been the author of *Bibliotheca*, a valuable account (extant) of the legends of Greece beginning with the origin of the gods and ending with the time of Theseus.
- APOLLÔNIOUS 'Dyscolus', grammarian, taught at Alexandria and Rome, 2nd century A.D. Was the first to reduce grammar to a system.
- APOLLÔNIOUS Rhodius, poet and grammarian, lived at Alexandria and at Rhodes in the 3rd century B.C., wrote epic poem *Argonautica*.
- APOLLÔNIOUS Tyanensis, of Tyāna in Cappadocia, born just before the Christian era, Pythagorean philosopher. His Life was written by Philostratus.
- APOLLÔNIOUS, author of an extant *Historiae Mirabiles*; otherwise unknown.
- APULCIUS of Madaura in Africa, born c. 114 A.D. Besides the *Metamorphoseis* or *Golden Ass*, his extant works include *Apologia sive de Magia*, a defence on a charge of using charms, *de Dogmate Platonis*, *de Mundo*, translation of the work once ascribed

- to Aristotle, and an Anthology of extracts collected by another from Apuleius' works
- ARÂTUS of Soloi in Cilicia, *flor* 270 B C, spent the latter part of his life at the court of Antigonos Gonatas, King of Macedonia. Wrote two astronomical poems entitled *Phaenomena* and *Diosêmeia*
- ARCHETÎMUS of Syracuse, wrote on the interview of Thales and other Sages with Cypselus of Corinth, at which he was present according to Diog. L.
- ARCHILOCHUS of Paros, *c* 720-676 B C, lyric poet famous especially for his satiric iambs
- ARCHIMÊDÊS of Syracuse, born 287 B C, most famous of ancient mathematicians and inventors, a number of his works survive.
- ARISTEAS of Cyprus, 3rd century B C, was an official at the court of Ptolemy Philadelphus (285-247 B C). To him is ascribed a Letter describing the circumstances of the translation of the Septuagint at Alexandria
- ARISTÎDÊS, P. AELIUS, Greek rhetorician, born 117 A D. Studied under Herodes Atticus at Athens, finally settled in Smyrna. Extant works: fifty-five Orations, and two treatises on Rhetoric
- ARISTÎDÊS QUINTILIANUS, probably 1st century A D, wrote a valuable work on Music
- ARISTOCLÊS of Messene, probably early 3rd century A D. Peripatetic philosopher. Fragments of his work on Philosophy are preserved by Eusebius
- ARISTOCRITUS, 5th century A D, member of the Manichean sect; author of a work in Greek entitled *Theosophia*
- ARISTÔN of Chios, 3rd century B C. Stoic philosopher, contemporary of Epicurus. Probably author of *Life of Epicurus* and *Life of Heraclitus* (though there are several others of the same name)
- ARISTOPHANÊS, Athenian comic poet, latter half of 5th and early 4th centuries B C
- ARISTOPHANÊS of Byzantium, 3rd century B C, librarian at Alexandria under Ptolemy II and Ptolemy III. Critic and scholar. Was chiefly occupied with new editions of the Greek poets, but also published a new edition of Plato, and writings on Aristotle including an abridged version of Aristotle's *De Natura Animalium*. His writings are preserved in fragments only
- ARISTOPHÔN, Athenian comic poet (Middle Comedy), nothing of his work survives except titles and a few fragments
- ARISTOTLE, 384-322 B C, born at Stageira in Chalcidicê, studied under Plato at Athens, 367-347 B C. Travelled to the Troad, lived there and at Mitylene. Became tutor to Alexander the Great; returned to Athens *c* 335 B C. Founded the Peripatetic School. Wrote works on Logic, mathematics, physics (inorganic nature), psychology, biology, metaphysics, ethics, politics, poetry and

- rhetoric The First Book of his *Metaphysics* is the chief authority for the views of his predecessors in philosophy from Thales onward, apart from their own writings.
- ARISTOXENUS of Tarentum, latter half of 4th century B.C. Peripatetic philosopher and musician, wrote numerous works on music, philosophy and history; of these, his *Elements of Harmony* is extant, and there are fragments of works on Pythagoras; wrote also *Memoirs of Praxidamas*
- ARIUS Didymus of Alexandria, 1st century B.C. - 1st century A.D., teacher of Augustus and friend of Maecenas, wrote on philosophy His works survive in extracts only, two of which are found in Stobaeus, and others in Eusebius and Clement
- ARMENIDAS, date unknown, wrote a work on Thebes
- ARNOBIUS, native of Africa, end of 3rd and beginning of 4th centuries A.D. Wrote *Adversus Gentes* (*Against the Pagans*), a vindication of Christianity against polytheism, one of the best sources of information for ancient religion
- ARRIAN, native of Bithynia, end of 1st and first half of 2nd centuries A.D. Friend and admirer of Epictetus, whose lectures he published at Athens in eight books, of which four are extant, as also an *Encheiridion* (Practical Handbook) of the teachings of Epictetus Arrian's most important work was his *Anabasis*, an account of the Asiatic campaigns of Alexander, valuable for its accuracy as well as its clear Xenophontic style
- ARTEMIDÔRUS, native of Ephesus, called Daldianus from his mother's birthplace of Daldis in Lydia Lived at Rome under Antoninus Pius and Marcus Aurelius (138-180 A.D.) Wrote a work *Oneirocritica*, *On the Interpretation of Dreams* (extant), its object is to prove that the future is revealed by dreams, but it contains valuable information on custom and ritual He is not to be confused with Artemidorus the geographer, also of Ephesus, *flor.* c. 100 B.C.
- ASCLÊPIADÊS of Myrleia in Bithynia, 2nd or 1st century B.C., perhaps pupil of Apollonius Rhodius, wrote various works of literary criticism and history
- ASIUS of Samos, early Greek poet, *flor.* c. 700 B.C.
- ASPASIUS, *flor.* c. 80 A.D. Wrote commentaries on most of the works of Aristotle, part of that on the *Nicomachean Ethics* is extant
- ATHANASIUS (SAINT) of Alexandria, 4th century A.D., Bishop of Alexandria, author of numerous ecclesiastical tracts, especially against the Arians, also of commentaries on the Scriptures.
- ATHËNÆUS of Naucratis in Egypt, earlier half of 3rd century A.D. Lived at Alexandria and Rome Extant work - *Deipnosophistae* (*Scholars' Banquet*), a collection of quotations and anecdotes, with discussions on every known subject

- ATHËNAEUS**, contemporary of Archimedes (born 287 B.C.). Wrote *On Engines of War* (extant), addressed to Marcellus, conqueror of Syracuse.
- ATHËNAGORAS**, 2nd century A.D., Athenian philosopher converted to Christianity, wrote in defence of Christian doctrine as opposed to paganism
- ATHËNODÔRUS** of Tarsus, surnamed Cananites from Cana in Cilicia, the birthplace of his father Pupil of Poseidonius at Rhodes Lived at Rome under Augustus (29 B.C.-14 A.D.) Stoic philosopher, wrote works *On Study and Education*, on the Peripatetics, and against the *Categories* of Aristotle, none of these is extant
- AUGUSTINUS** (SAINT AUGUSTINE), 354-430 A.D. Chief work, *De Civitate Dei*, a defence of Christianity against the polytheistic cults, and an autobiographical work, *Confessions*
- AULUS GELLIUS**, see **GELLIUS**
- AUSONIUS** of Bordeaux, 4th century A.D. Gallic Latin poet and rhetorician, wrote epigrams, poems, letters, etc
- AVIËNUS**, Latin poet, later 4th century A.D. Wrote descriptive poetry, including *Descriptio Orbis Terrae*, *Ora Maritima*, *Aratea Phaenomena* and *Aratea Prognostica*, a paraphrase of the two works of Aratus, in hexameter verse
- AXIOPISTUS** of Locris or Sicyon, date uncertain, wrote poems entitled *Maxims* and *Canon*, falsely attributed to Epicharmus
- BACCHEIUS** of Tanagra in Boeotia, 3rd century B.C., one of the earliest commentators on the writings of Hippocrates, only fragments remain
- BOËTHIUS**, native of Rome, 5th-6th centuries A.D., statesman and author. Chief work *De Consolatione Philosophiae*, translated into Latin by many of the Greek philosophers, especially Aristotle, with commentaries, also wrote works on mathematics and music
- CAELIUS AURËLIANUS**, native of Numidia, probably 4th century A.D., wrote in Latin medical works, of which are extant *De Morbis Acutis* and *De Morbis Chronicis*
- CALLIMACHUS**, 3rd century B.C. Scholar and poet, librarian at Alexandria under Ptolemy Philadelphus and Ptolemy Euergetes (285-222 B.C.)
- CEDRËNUS**, late Byzantine writer, author of a historical work beginning with the creation of the world and going down to 1057 A.D.
- CELSUS**, lived at Rome, probably under Augustus and Tiberius (29 B.C.-37 A.D.) Wrote *De Medicina* (extant)
- CENSORIËNUS**, 3rd century A.D. Wrote *De Die Natali* (composed 238 A.D.) on the life of man, and methods of calculating time
- CHALCIDIUS**, probably 5th century A.D., author of a translation into Latin of Plato's *Timaeus*, with commentary

- CHAMAELEON of Heracleia on the Black Sea, latter half of 4th century B C , pupil of Aristotle, wrote treatises on Greek literature and philosophy, which survive in fragments only
- CHARÔNDAS of Catana, date uncertain, probably 6th century B C , drew up codes of law for his own and other Chalcidian cities of Sicily and Italy
- CHRYSIPPUS, born at Soli in Cilicia, 280 B C , died 207 B C , Stoic philosopher His many writings have not survived, but he was one of the founders of the Stoic School
- CICERO, M TULLIUS, 106-43 B C Roman statesman, orator and writer
- CLAUDIÂNUS MAMERTUS, 5th century A D , presbyter at Vienne in Gaul, friend of Sidonius Chief work (extant) *De Anima*, an attempt to refute the theory that all things, including the soul, are material
- CLEANTHÊS, born at Assos in the Troad, c 300 B C , died c 220 B C Stoic philosopher, pupil of Crates and Zeno at Athens His *Hymn to Zeus* is extant
- CLEARCHUS of Soloi, latter half of 4th century B C , pupil of Aristotle, wrote numerous treatises on art, science and philosophy, and in particular on Plato, including an *Encomium*, and commentaries on *Timaeus* and on the mathematical parts of the *Republic*, also *Lives*, a biographical work in at least eight books
- CLEMENS, surnamed Alexandrinus, 2nd-3rd centuries A D , lived most of his life at Alexandria, but may have been born at Athens At first pursued philosophy, but was converted to Christianity Chief extant works *Paedagogus* (*The Teacher*), *Protrepticus*, a hortatory address to the Greeks, *Stromateis* (*Miscellanies*), and *Quis Drues Salvetur?*
- CLEOBÛLINÊ, daughter of Cleobulus of Lindus in Rhodes, one of the Sages, his *floruit* is c 580 B C She composed riddles
- CLEÔNIDÊS, date and place unknown, wrote a musical treatise called *Introduction to Harmony*, sometimes ascribed to Euclid
- CLÔDIUS Tuscus, 1st century B C -1st century A D (reign of Augustus) Author of a Farmers' Calendar, preserved in a much-enlarged version in Joannes Lydus, *De Ostentis*
- COLUMELLA of Gades in Spain, 1st century A D , lived mostly at Rome. Extant works *De Re Rustica*, and *De Arboribus*
- CORNÔTUS, L ANNAEUS, born in Libya, lived at Rome, 1st century A D . Stoic philosopher, became the teacher and friend of the satiric poet Persius, wrote commentary on the *Categories* of Aristotle, and other philosophical and literary works (mostly lost), including a Hellenic Theology. His only extant work is *On the Nature of the Gods*
- CRATÊS, Athenian comic poet, middle 5th century B C
- CRATEUS, probably 1st century B C , Greek physician and herbalist, mentioned by Galen as an eminent writer on *Materia Medica*.

- CRATINUS, senior, 519-422 B.C Chief poet of Old Comedy at Athens, and rival of Aristophanes
- CRATINUS, junior, 4th century B.C , Athenian poet of Middle Comedy.
- CROTÔN, unknown author of a work *Catacolumbêtês* (*The Diver*) in which it was stated that a certain Crates first brought the book of Heracleitus to Greece Proper
- CURTIVS (Q CURTIUS RUFUS), 1st century A.D Roman historian of Alexander the Great, his work *On the Exploits of Alexander* was in ten books, of which the first two are lost
- CYPRIAN, native of Africa, 3rd century A.D , convert to Christianity, Bishop of Carthage Wrote many learned treatises against paganism, and on Christian faith and doctrines
- CYRILLUS, Bishop of Alexandria, early half of 5th century A.D , wrote polemical works on Christian doctrine, including a work *Against Julian* (the Apostate) in ten books, and commentaries on the Scriptures. Many of these are extant.
- DAIMACHUS of Plataea, latter half of 4th century B.C , wrote a work on India (lost)
- DAMASCIUS the Syrian, native of Damascus, born c. 480 A.D ; teacher of Neo-Platonic philosophy at Athens early 6th century A.D Extant work *Problems and Solutions concerning First Principles*
- DAMASTÊS of Sigeum, early half of 5th century B.C , contemporary of Herodotus and Hellanicus, Greek historian His works are lost
- DAMIÂNUS (HÊLIODÔRUS DAMIANUS) of Larissa, lived later than Euclid, wrote short work on *The Hypotheses of Optics*, taken mostly from the *Optics* of Euclid
- DAMÔN of Cyrene, date uncertain, wrote *On the Philosophers*
- DAMOXENUS, Athenian comic poet of the New Comedy
- DAVID of Nerken, Armenian philosopher, end of 5th and beginning of 6th centuries A.D , studied at Athens, wrote commentaries in Greek on Plato and Aristotle, that on the *Categories* of Aristotle, and also one on the *Isagôgê* of Porphyry, are extant
- DEINOSTRATUS, 4th century B.C , pupil of Eudoxus Geometer Said to have discovered proof of squaring the circle by means of the *quadratrix*
- DÊMÊTRIUS of Byzantium, probably 1st century B.C , Peripatetic philosopher, wrote *On Poetry* and *On the Poets* (Not the same as Demetrius of Byzantium the historian, 3rd century B.C)
- DÊMÊTRIUS CHLÔRUS, author of a work on botany quoted by the Scholiast on Nicander, *Theriaca* (q.v.)
- DÊMÊTRIUS LACÔN ('the Spartan'), perhaps 3rd century B.C , Epicurean philosopher Probably author of a philosophical work found at Herculaneum, entitled *Investigation (Diatita) of Certain Questions*; the MS is indecipherable

- DÊMÊTRIUS of Magnêsia, 1st century B C, contemporary of Cicero, Greek scholar, wrote *On Concord*, and *On Poets and Historians of the same name*, a critical work which has not survived, but which was often quoted
- DÊMÊTRIUS PHALÊREUS (of Phalêrus in Attica), 4th century B C, statesman, orator, philosopher and poet Pupil of Theophrastus Governed Athens from 317-307 B C, went into exile to Alexandria under Ptolemy Lagi (Soter) Most of his writings have perished; extant: *On Elocution* (though this is thought by some not to be his).
- DÊMÊTRIUS of Scepsis in the Troad, early half of 3rd century B C, contemporary of Aristarchus of Samos, Greek scholar Wrote a commentary on the Catalogue in *Iliad II*
- DÊMÊTRIUS of Troezen, Greek scholar quoted by Athenaeus and Diog. L Date unknown Wrote a treatise *Against the Sophists*
- DÊMOSTHENÊS, Athenian statesman and orator, 385-322 B C
- DERCYLLIDÊS, probably 1st century A D Wrote commentary (lost) on Plato's works (including *Timaeus*), and helped to divide these into Tetralogies, *see also under* THRASYLLUS
- DIAGORAS of Melos, latter half of 5th century B C, pupil of Democritus. Philosopher and poet, surnamed Atheist because of his attacks on the popular religion, especially the Eleusinian Mysteries A work called *Phrygian Conversations* (*Logoi*) was ascribed to him
- DICAEARCHUS of Messina in Sicily, 4th century B C, philosopher, geographer and historian Pupil of Aristotle and Theophrastus, spent most of his life in Greece Proper, especially in the Peloponnese Wrote many works, surviving in fragments only, his chief work was a comprehensive study of Greek history called *The Life of Hellas*
- DIDYMUS of Alexandria, 1st century B C and 1st century A D, contemporary of Cicero and Augustus, scholar and literary critic. Wrote commentaries on Homer, Pindar, Sophocles, the Attic orators, etc., and is a source of information for later scholiasts and lexicographers His treatises, said to number four thousand, have all perished
- DIDYMUS, a Pythagorean mentioned by Porphyry as having written on the Pythagorean Theory of Numbers
- DIDYMUS of Alexandria, perhaps 3rd century A D, wrote on Agriculture
- DÎNÔN, 4th century B C, wrote a History of Persia, was the father of Cleitarchus, who accompanied Alexandria the Great on his campaigns and wrote their history Both father and son were said to have been over-credulous
- DÎD CHRYSTOMUS, born at Prusa in Bithynia, about 50 A D, lived at Rome under Trajan. Greek historian and Sophist. Extant about eighty 'orations', or essays in oratorical form on political, moral and philosophical subjects

- DIACLÈS** of Carystus in Euboea, 4th century B.C. Physician, wrote several medical works, surviving only in quotations by Galen and others
- DIONÔRUS** SICULIUS, of Agyrium in Sicily, 1st century B.C. and 1st century A.D., contemporary of Cicero and Augustus, lived at Rome. Wrote in Greek a history of the world in forty books, from legendary times to his own day, of this, Books 1-5, and 11-20 are extant. The rest are lost except for quotations. The work is uncritical, but preserves valuable material
- DIONÔRUS** of Ephesus, author of a work on Anaximander, otherwise unknown
- DIODOTUS** wrote a commentary on Heracleitus, may have been Diodotus of Sidon, a Peripatetic philosopher mentioned by Strabo.
- DIOGENÈS** LAERTIUS, of Laërte in Cilicia, probably 2nd century A.D. Compiler of *Lives of the Philosophers*. The material is valuable, but the compilation is without plan or critical judgment, and is full of inaccuracies
- DIOGENÈS** of Oenoanda. Epicurean philosopher, became known through an inscription found at Oenoanda in Cabalia (Asia Minor) in 1884, giving extracts from the works of Epicurus
- DIOMÈDÈS**, probably 4th or 5th century A.D., Latin grammarian, extant work, *On Oratory, on the Parts of a Speech, and on Metres*
- DIONYSIUS**, Bishop of Alexandria, 3rd century A.D. Wrote a work *On Promises*, of which two extracts are extant. Fragments of his work *Against Sabellius* are preserved by Athanasius and Basilus, and of that *On Nature* by Eusebius in his *Praeparatio Evangelica*. An *Art of Rhetoric* is sometimes wrongly ascribed to him
- DIONYSIUS** of Halicarnassus, 1st century B.C. Lived in Rome. Wrote in Greek a History of Rome, still partly extant, and many works of criticism. He is the foremost literary critic of antiquity, but his work as a historian was rhetorical rather than scientific. A work *On Music* attributed to him may be that of a later writer of the same name and place
- DIONYSIUS** PERIÊGÊTÈS, probably flor. c. 300 A.D. Wrote a *Description (Periegesis) of the World* in hexameters, the material being probably taken from Eratosthenes, this is extant
- DIONYSIUS** the Younger, tyrant of Syracuse, 4th century B.C. Wrote a treatise *On The Poems of Epicharmus*
- DIOSCORIDÈS** Pedacius or Pedanius, of Anazarba in Cilicia, probably 2nd century A.D. Extant *Materia Medica* in five books, for a long time the standard work on this subject, it is of a high level of learning and research
- DIOSCORIDÈS** the glossographer, 2nd century A.D. Edited the works of Hippocrates, his emendations are mentioned, sometimes with disapproval, by Galen

- DIPHILUS, probably early half of 5th century B.C., predecessor of Eupolis and Aristophanes, wrote scurrilous lampoons in iambs; also a poem called *Thersites* (Not to be confused with Diphilus the writer of New Comedy, contemporary of Menander.)
- DŌSIADES, probably a Cretan, earlier than the 1st century B.C. Wrote (perhaps at Alexandria) a work on Crete, mentioned by Diodorus and Athenaeus
- DOURIS of Samos, 3rd century B.C., ruler and historian. His works, which included a History of Greece from 370 B.C. onwards, have perished. His accuracy was questioned in antiquity
- ELEYSIS or Eleusis, author of a work *On Achilles*, otherwise unknown.
- ÉLIAS, Christian Neo-Platonist of whom nothing appears to be known except that he wrote a commentary on the *Categories* of Aristotle, and *Prolegomena* to the *Isagôgê* of Porphyry
- ENNIUS, born in Calabria, 239 B.C., Latin poet. Chief work, *Annales*, a History of Rome in hexameters, he also wrote tragedies, and a philosophical poem called *Epicharmus*
- EPHORUS of Cyme in Aeolis, lived from c. 400-333 B.C. Greek historian, pupil of Isocrates, was the first to attempt a World History, which has perished except for quotations. He was impartial and conscientious, but did not always use the best authorities, his work was much used by Diodorus Siculus and others
- EPICLĒTUS of Hieropolis in Phrygia, 1st-2nd centuries A.D. Stoic philosopher. Taught at Rome, and later in Epirus. He left no writings. His pupil Arrian compiled an *Encheiridion* (Manual) from his discourses, and also preserved his lectures in eight books, of which four are extant (*Dissertationes*)
- EPICŪRUS, 342-270 B.C. Founder of the School of Hedonist philosophy named after him. His writings are lost except for four letters and the *Ruling Principles* embodying his chief precepts. Only fragments of his most important work, *On Nature*, survive
- EPIGENĒS, grammarian of Alexandria, wrote on the poems of Orpheus, assigning the different parts to Pythagorean authors such as Cecrops and Brontinus, he may have been contemporary with Callimachus
- EPIPHANIUS, Bishop of Constantia in Cyprus, born in Palestine, 1st half of 4th century A.D. Wrote on the Christian faith, and against heresies
- ERATOSTHENĒS of Cyrene, 276-196 B.C.; librarian at Alexandria under Ptolemy Evergetes and Ptolemy Epiphanes. Wrote on all
- branches of knowledge: history, philosophy, grammar and the sciences. His chief work was a treatise on Geography much used by Strabo. He also wrote two poems on astronomical subjects. His writings survive in fragments only

- ERÔTIANUS, 1st century A D , Greek grammarian or physician in the reign of Nero (A D 54-68) Wrote a Hippocratic lexicon still extant
- ETYMOLOGICUM GENUINUM, the oldest of the Etymologies, or grammatical encyclopaedias, of late Byzantine times; a compilation of the late 10th or early 11th century A D , existing in two MSS (See Pauly-Wissowa, VI, 812)
- ETYMOLOGICUM GUDIANUM, originally compiled in the second half of the 11th century A D , used other sources than those of the *Etymologicum Genuinum*
- ETYMOLOGICUM MAGNUM, compilation of the 12th century A D , place of origin unknown, perhaps Athos
- ETYMOLOGICUM ÔRÎONIS, compilation ascribed to Ôrîôn, scholar of probably the 5th century A D , who taught at Caesarea and Alexandria, his *Lexicon* was used by later compilers
- EUANTHÊS of Miletus, historian mentioned by Diog L , otherwise unknown
- EUCLEIDÊS (EUCLID), lived at Alexandria under Ptolemy I (323-285 B C) Platonic philosopher and mathematician Wrote numerous mathematical works, of which the following are extant *Elements*, *Data*, *Sectio Canonis* (*Division of the Scale*), and *Phaenomena*, a work on astronomy
- EUDÊMUS of Rhodes, 4th century B C , pupil of Aristotle, edited many of Aristotle's works, the *Eudemian Ethics* is probably his summary of a course of Aristotle's lectures earlier than the *Nicomachean Ethics* He also wrote on Physics, Mathematics and other subjects, closely following and perhaps summarising Aristotle's works
- EUDOXUS of Cnidus, 4th century B C , son of Aeschines, astronomer, geometer, physician and legislator Wrote works on astronomy and geometry, now lost, his astronomical work *Phaenomena* formed the material for the poem of Aratus
- EUËNUS of Paros, gnomic elegiac poet, there were two of this name, one a contemporary of Socrates
- EUGAMÔN (or EUGAMMÔN) of Cyrene, 6th century B C , epic poet, wrote a continuation of the *Odyssey* called *Telegonia* (lost), an account of which is preserved in Proclus' *Chrestomathia*
- EUHÊMERUS, probably of Messene, latter half of 4th century B C Lived in Macedonia at court of Cassander Wrote a *Sacred History* in 9 books, said to be based on a voyage down the Red Sea The book gave rationalistic explanations of myths, and was used by Diodorus and others, translated into Latin by Ennius It popularized this method of treatment, called Euhemerism.
- EUPHORIÔN of Chalcis in Euboea, grammarian and poet, 3rd century B C , lived at Athens, and went to Syria and became librarian of Antiochus the Great Wrote many works in verse and prose, mostly on history and mythology.

EUPOLIS, latter half of 5th century B C , Athenian poet of Old Comedy.
EURIPIDÊS, 480-406 B.C.

EUSEBIUS, born in Palestine, c. 264 A D , Bishop of Caesarea, 315 A D.; general and ecclesiastical historian. Principal works extant: *Chronicon* or *Chronica* (discovered entire in 1818), an account of ancient history with synchronological tables; *Praeparatio Evangelica*, a collection of facts and quotations from ancient writers, *Demonstratio Evangelica* and *Ecclesiastical History*; *Against Marcellus* (Bishop of Ancyra), and *Against Hierocles* (who advised Diocletian to begin his persecution); and a review of the Life of Apollonius of Tyana by Philostratus (q v)

EUSTATHIUS, native of Constantinople, latter half of 12th century A D , Archbishop of Thessalonica. Wrote learned commentary on the *Iliad* and *Odyssey*, consisting mostly of extracts from earlier Alexandrian commentators now lost, and a commentary on Dionysius Periegetes (q v).

EUSTRATIUS, of Constantinople and Nicaea, 11th-12th centuries A.D. Lived under Alexius I Comnenus (1081-1118 A.D.) Wrote commentaries in part extant on Aristotle, *Nicomachean Ethics* and *Posterior Analytics*

EUTOCIUS of Ascalon in Palestine, middle of 6th century A D. Commentator on Archimedes, and on Apollonius of Perga the mathematician (3rd century B C)

FAVORÎNUS of Arles in Gaul, first half of 2nd century A D (reign of Hadrian, 117-138 A D) Philosopher and Sophist, friend of Plutarch. His works, written in Greek, on history, philosophy and literature, are lost except for quotations

FESTUS, SEXTUS POMPEIUS, probably 2nd century A D. Roman scholar and lexicographer. Compiled a dictionary (extant) of Latin words and phrases, abridged from the great lexicon of M. Verrius Flaccus, which has perished

FULGENTIUS, FABIUS PIANCIANÊS, c. 480-550 A D. Latin grammarian, wrote works of little value, of which are extant a collection of legends, a glossary of obsolete words and phrases, a universal history, and an allegorical exposition of the contents of Vergil's poems

GALÊNUS, CLAUDIUS (GALEN) born at Pergamum, 130 A.D., lived mostly at Rome. He is the most important medical writer of antiquity, except Hippocrates. His extant writings acknowledged as genuine number over eighty, and various spurious works have attached themselves to his name

GELLIUS, AULUS, of Rome, 2nd century A D. Latin scholar. Wrote *Noctes Atticae*, a miscellany of extracts from Greek and Roman writers, with occasional comments

- GEMINUS** of Rhodes, probably 1st century B C. An extant work called *Introduction (Isagôgê) to Astronomy* is attributed to him.
- GENETHLIUS**, native of Patrae in Palestine, late 3rd or early 4th century A.D., taught at Athens, distinguished for learning, died aged 28. Author of a work on Dialects, of rhetorical Exercises, and panegyric orations. Was confused by ancient scholars with his contemporary the orator Menander of Laodicea.
- GEORGIUS** Pisides (the Pisidian), 7th century A.D. Keeper of the Rolls at St Sophia in Constantinople. Wrote works, mostly historical, in iambic verse. His extant works include an account of the expedition of the Emperor Heraclius against Persia, and a *Hexaëmeron* or Story of the Creation.
- GIACUS** of Rhegium, 5th-4th centuries B.C., contemporary of Democritus, wrote an account of the ancient poets and musicians, and commentaries on Empedocles and Democritus. His work was sometimes ascribed to Antiphon the orator.
- GRÉGORIUS** of Corinth, surnamed Pardus, probably early half of 12th century A.D. Archbishop of Corinth. Wrote *On Dialects*, a commentary on Hermogenes' *Methodus*, and other grammatical and chronological works.
- HARPOCRATIŌN**, Valerius, of Alexandria, probably 2nd century A.D. Greek lexicographer. His Glossary to the Ten Attic Orators is extant, it contains explanations of legal and political terms, and accounts of persons and things referred to by the orators, and is of the highest value.
- HECATAEUS** of Miletus, 6th-5th centuries B.C., early Greek historian and geographer. Wrote a Description (*Periodos* or *Periegesis*) of the world, and *Genealogiae* or *Historiae*, Greek legends and traditions. He corrected the map of the world drawn by Anaximander.
- HÊGÊSIANAX** of Troas, date unknown. Wrote glossaries on Democritus, and on the poets.
- HÊIIODÔRUS** of Athens, probably middle of 2nd century B.C. Surnamed Periegetes, wrote description of the works of art on the Acropolis, which was one of the sources of Pliny's account of Greek art.
- HÊIIODÔRUS** of Êm'sa in Syria, latter half of 4th century A.D. Wrote a romance, entitled *Aethiopica*, later became Bishop of Tricca in Thessaly.
- HELLANICUS** of Mytilene in Lesbos, 5th century B.C., Greek historian and geographer. Wrote many historical works, called *Troica*, *Aeolica*, *Persica*, etc., and also an important chronological work called *The Priestesses of Hera*, giving dates compiled from the temple records at Argos. This, one of the earliest attempts to establish dates, was used by Thucydides and others.
- HÊPHAESTIŌN**, middle of 2nd century A.D., Greek scholar. Taught

- Greek to the Emperor Verus at Rome Wrote a valuable *Enchiridion* [Manual] on *Metres*, which is extant, and a treatise on the Antiphon of Xenophon's *Memorabilia* (i.e. Antiphon the Sophist), said to have been plagiarized from a work (lost) by Adrastus the Peripatetic (2nd century A.D.)
- HÉRACLEIDÉS LEMBOS, born at Callatis, 2nd century B.C., lived at Oxyrhynchus and Alexandria, statesman and historian Wrote a History in thirty-seven books, and biographical works (lost).
- HÉRACLEIDÉS PONTICUS, born at Heracleia in Pontus, 4th century B.C. Pupil of Plato and Aristotle Wrote works on philosophy, mathematics, politics, etc., of which only fragments survive A work *On Constitutions* was attributed to him, but its authorship is doubtful
- HÉRACLEITUS (or Heracleides), probably 1st century A.D., Greek scholar Wrote a work (extant) called *Homeric Allegories*, a defence of Homer against Plato and Epicurus, and allegorical interpretation
- HERENNIUS PHILO, sometimes called Byblus (of Byblos in Phoenicia) lived at Rome, latter half of 1st and early 2nd centuries A.D. (Nero to Hadrian) Wrote in Greek many rhetorical and historical works, including a treatise on the Jews
- HERMARCHUS of Mytilene, 3rd century B.C., rhetorician, probably studied under Democritus, became disciple of Epicurus, who bequeathed to him his Garden at Athens Only titles of his works survive They included treatises on Empedocles, and against Plato and Aristotle
- HERMÈS TRISMEGISTUS, the Egyptian Hermes, i.e. Thoth, source of all knowledge, to whom the Neo-Platonists ascribed many of their own writings, these were composed mostly in the 4th century A.D. from earlier sources A number of them are extant, including the dialogue *Poemander*, on the origin and nature of the world, God, the human soul, etc., and *Coeranides*, an alphabetical handbook of the magical and medicinal properties of stones, plants and animals (probably compiled from oriental sources)
- HERMÈSIANAX of Colophon, 4th century B.C. (under Alexander the Great), elegiac poet, wrote an elegiac poem surviving in quotations only, of love stories addressed to his mistress Leontion
- HERMEIAS, latter half of 2nd century A.D., Greek Christian writer, extant works, *Irrisus Gentilium Philosophorum* (*Disparagement of Pagan Philosophers*), and a commentary on Plato's *Phaedrus*
- HERMIPPUS of Smyrna, latter half of 3rd century B.C., philosopher, disciple of Callimachus of Alexandria Wrote *Lives* of the philosophers, sophists, orators, historians and poets, much used by later writers
- HERMIPPUS SEU DE ASTROLOGIA title of a work (discovered and published in 1830) copied by Joannes Katrarios or Katrares, late Byzantine scribe The work is in dialogue form, and is a de-

fence, from a Christian standpoint, of astrology from the attacks of other Christians

HERMOGENËS of Tarsus, latter half of 2nd century A D (reign of Marcus Aurelius, 161-180 A D.), Greek rhetorician Five of his works are extant *Staseis*, a Manual for orators in civil cases, *De Inventione*, rules for composing speeches, *De Formis* or *De Ideis Oratoris*, on the forms of oratorical style, *De Apto et Sollerti Genere Dicendi Methodus*, application of the rules of style, and *Practical Exercises* in the use of models There was also a commentary (now lost) on Demosthenes

HËRODËS ATTICUS, of Marathon in Attica, born early 2nd century A D Greek rhetorician, taught at Athens and Rome, amongst his pupils were the Emperors Marcus Aurelius and Verus Wrote numerous works, now lost An extant *Republic* is ascribed to him, but its authorship is uncertain

HËRODIÂNUS, AËIIUS, of Alexandria, latter half of 2nd century A D. (reign of M Aurelius, 161-180 A D), son of Apollonius Dyscolus (qv) Lived at Rome, taught the Emperor Marcus Aurelius, to whom he dedicated his work on grammar, prosody and etymology, an epitome of which is extant His other works have perished except for fragments He was very highly regarded in antiquity

HËRODICUS of Babylon, 2nd century B C, succeeded Cratês of Mallus the founder of the Pergamene School of grammar, and like Crates, wrote in opposition to Aristarchus of Samothrace of the Alexandrian School, works lost

HËRODÔRUS of Heracleia in Pontus, probably latter half of 5th or early 4th century B C Wrote a work on the legend of Heracles, with geographical and historical information, also a treatise on Orpheus and Musæus

HËRODOTUS of Halicarnassus, 5th century B C Historian of the Persian Wars

HËRÔN of Alexandria, 3rd century B C, mathematician and engineer, famous for his mechanical inventions Wrote works on these subjects, only titles and fragments survive.

HËROPHILUS, unknown writer on mythology, probably not the same as Herophilus of Chalcedon, the physician (4th-3rd centuries B C), who settled in Alexandria under Ptolemy Soter

HËSIOD, born at Ascra in Boeotia, 8th century B C Epic poet.

HËSYCHIUS of Alexandria, probably 4th century A D, Greek lexicographer His dictionary is based on that of Diogenianus, and on the writings of other Alexandrians such as Aristarchus He was a pagan; notes on Christian subjects are by a later hand The work is one of the most important sources of knowledge of the Greek language and literature

- HĒSYCHIUS** of Miletus, 6th century A D., his works included an *Onomastologos*, which seems to have been a summary of Diogenes Laertius' Lives of the Philosophers. He also wrote a universal history, and an account of the origins of Constantinople.
- HIEROCLĒS**, lived at Alexandria, middle of 5th century A D., Neo-Platonist philosopher. Extant work: a commentary on the so-called Golden Verses of Pythagoras, and an account of his philosophy.
- HIERŌNYMUS** (Saint Jerome), native of Stridon (Dalmatia-Pannonia), 4th and early 5th centuries A D. Besides his translation of the Bible into Latin, he wrote letters, treatises, and commentaries on the Scriptures, he also translated the *Chronicon* of Eusebius (*qv*) from Greek into Latin, and brought it down to 378 A D.
- HIERŌNYMUS** of Egypt. Mentioned by Josephus (37 A D - c 135 A D.), otherwise unknown. Wrote a *Phoenician Archaeology*.
- HIERŌNYMUS** of Rhodes, 4th-3rd centuries B C, disciple of Aristotle, philosopher quoted by Cicero. Wrote philosophical treatises, historical notes, and letters.
- HIMERIUS** of Prusa in Bithynia, 4th century A D., studied and taught rhetoric at Athens. Twenty-four of his Orations are extant, of the rest, there survive extracts from thirty-six, and fragments of eleven.
- HIPPARCHUS**, writer on Democritus, quoted by Diog. L., which of the writers of this name he was, is unknown.
- HIPPASUS** the Spartan, date unknown, wrote a *Spartan Constitution* mentioned in Diog. L.
- HIPPOBOTUS**, time and place unknown, is quoted by Diog. L. Wrote a work on the philosophic Schools, and an account of the philosophers.
- HIPPOCRATĒS** of Cōs, 5th-4th centuries B C. Physician, and founder of the School of Medicine at Cōs. Wrote many works on medicine, practical and theoretical, other works, written by his followers, were attributed to him.
- HIPPOLYTUS**, Greek ecclesiastical writer, lived at Rome, 3rd century A D. Among his works was a *Refutatio omnium Haeresium* (*Against All Heresies*).
- HISDOSUS**, Scholast, annotated Chalcidius' Commentary on Plato's *Timaeus*.
- HORACE** (Q HORATIUS FLACCUS), 65-8 B C.
- HŌRAPOLLŌN** of Phaenobythis in Egypt, 4th-5th centuries A D., Greek grammarian. Taught first at Alexandria, then at Constantinople (reign of Theodosius, 378-395 A D.) Wrote commentaries on Sophocles, Alcaeus and Homer, and a work entitled *Temenika*, *On Sacred Precincts*. Under the name of Horapollon is also extant a work entitled *Hieroglyphics*, purporting to be a Greek translation by one Philippus from Egyptian, explaining the hieroglyphic writings.

HYGĪNUS, Roman writer, author of two extant works *Fabularum Liber*, a book of myths and genealogies, and *Poeticon Astronomicum*, an account of the constellations and their myths. He may be the same as C. Julius Hyginus, a native of Spain, Latin grammarian living at Rome in the reign of Augustus (29 B.C. - 14 A.D.); or he may be another Hyginus who lived in the 2nd century A.D.

HYPEREIDES, 4th century B.C., one of the Ten Attic Orators, whose speeches are preserved in extracts and quotations only.

IAMBlichus of Chalcis in Coelê-Syria, 4th century A.D., Neo-Platonist philosopher, wrote a work in ten books (of which five are extant) entitled *On the Philosophy of Pythagoras*. The first book, a Life of Pythagoras and members of his School, is an uncritical compilation from earlier works, the second (*Protreptikoi Logoi*) is an introduction to the study of Plato, the third (*De Communi Mathematica Scientia*) contains fragments of the works of earlier Pythagoreans, the fourth was entitled *On the 'Introduction to Mathematics' of Nicomachus*, the fifth and sixth are lost, the seventh, on the religious significance of the science of Number, is extant. The eighth, ninth and tenth are lost: they dealt with music, geometry and the sphere. He also wrote *De Mysteriis* (extant), a defence of Egyptian and Chaldaean religion, sometimes regarded as spurious. Stobaeus preserves a fragment of a treatise *De Anima*, and of an epistle on Concord.

IBYCUS of Rhegium, 6th century B.C., Greek lyric poet, lived at Samos in the reign of Polycrates.

ÎRÊNAEUS, probably native of Smyrna, 2nd century A.D. Bishop of Lyons in Gaul. Chief work *Adversus Haereses*, written originally in Greek but surviving only in a Latin version, except for a few fragments.

ISIDÔRUS Hispalensis, Bishop of Seville, 6th-7th centuries A.D. Spanish ecclesiastic, noted for his learning and eloquence. His most important work was his *Etymologiae*, an Encyclopaedia of existing knowledge.

ÎSOCRATÊS, 4th century B.C. Attic orator and essayist. Twenty-one of his Orations survive.

JÔANNÊS DIACONUS, author of an allegorical interpretation of Hesiod's *Theogony*, and a commentary on Hermogenes (*q.v.*). Which of this name he was is uncertain.

JÔANNÊS KATRARIOS, see under *HERMIPPUS SEU DE ASTROLOGIA*.

JÔANNÊS LAURENTIUS LYDUS, born in Lydia, 490 A.D., lived at Constantinople. Wrote *De Mensibus*, a historical commentary on the Roman calendar, festivals, etc. (extant in summaries), *De Ostentis*, on Signs and Portents, and *On the Roman Magistracies*.

- JŌANNĒS MALALAS, native of Antioch, lived at Byzantium, date after Justinian (A D 526-565) Wrote History of the World, dealing especially with the reign of Justinian and his immediate predecessors; uncritical but useful for information preserved
- JŌANNĒS 'Philoponus' (the Industrious), of Alexandria, 7th century A D Among his extant writings are commentaries on Aristotle (*De Anima, De Generatione et Corruptione, De Generatione Animalium, Physics, Metaphysics, Analytics*) His industry was prodigious, but his critical powers weak
- JŌANNĒS SICULUS, of Sicily, 9th century A D, author of a Greek *Chronicon*, from the Creation to 866 A D
- JŌANNĒS TZETZES, of Constantinople, 12th century A D, Greek grammarian, learned but vain Of his many works there survive two verse compositions *Iliaca*, in hexameters, and *Chiliades*, consisting of unconnected narratives from legend and history This is valuable for the material it preserves it has 12,661 lines, and was divided arbitrarily by its first editor Nicolas Gerbelius into books of 1000 lines, without reference to sense, hence the title *Chiliades* There are also a *Theogony*, an iambic poem on the education of children, and versified treatises on metre, on Pindaric metre, on the *Iliad*, etc, all of little worth
- JŌSĒPHUS FLAVIUS, born at Jerusalem, 37 A D, died at Rome aged about 98 Wrote a *History of the Jewish War* (66 A D), *Jewish Antiquities*, an account of Jewish history from the Creation to 66 A D, *Against Apion*, a reply to the treatise of the Greek grammarian Apion directed against the antiquity of the Jewish race, *To the Maccabees*, i.e. those who can endure in the spirit of the Maccabees, an account of the martyrdom of a priest Eleazar and others in the persecution of Antiochus Epiphanes, and an Autobiography
- JULIANUS, FLAVIUS CLAUDIUS ('the Apostate'), Emperor of Rome, 361-363 A D Extant works Letters, Orations, *The Caesars, or The Banquet, Misoprogôn* (the Beard-Hater) His Letters were intended for publication, and deal with the history of his times
- JULIUS AFRICANUS, a Libyan, 3rd century A D, lived at Emmaeus in Palestine, and at Alexandria One of the most learned of the early Christian writers Wrote a Chronicle in five books, from the Creation to 221 A D, this is lost, but part of it is given by Eusebius in his *Chronicon*, and fragments are preserved by other writers
- JUVENAL, early 2nd century A D, Roman satiric poet
- KATRARIOS, *see under HERMIPPUS SEU DE ASTROLOGIA*
- LABĒRIUS, DECIMUS, Roman eques, c. 107-43 B C, writer of mimes.

- LACTANTIUS, born probably in Italy, studied in Africa, settled at Nicomedeia in Asia Minor, 3rd-4th centuries A.D.; Latin rhetorician and teacher, converted to Christianity. Chief extant works *Divinae Institutiones*, an attack on paganism and introduction to Christianity, *De Ira Dei*, pamphlet directed against the Epicureans, *De Opificio Dei*, on the wisdom of God as revealed in the creation of man and the soul.
- LAURENTIUS LYDUS, *see* JOANNES LYDUS
- LESBONAX, place and date uncertain, probably 1st century A.D., Greek grammarian, wrote a work (extant) *On Grammatical Figures*, useful for its preservation of material. (Probably not the same as Lesbonax of Mitylene, author of three extant orations.)
- LIBANIUS, born at Antioch on the Orontes, 4th century A.D. Studied at Athens. Taught Greek rhetoric at Constantinople and Nicomedeia. Of his works, there are extant orations, letters, and a *Life of Demosthenes*.
- LOBON of Argos, date uncertain, wrote a work on the Poets, mentioned by Diog. L.
- LONGINUS, probably of Athens, 3rd century A.D. Greek philosopher and grammarian. Opened a School at Athens, later went to Palmyra in Syria. The treatise *On the Sublime* attributed to him is now thought to be the work of an earlier writer.
- LUCIAN, born at Samosata in Syria, 2nd century A.D. Greek rhetorician and satirical writer. Eighty-two works ascribed to him are extant, but some are spurious. Of the genuine works, the most important are the Dialogues, some of which satirize Greek philosophy and religion, while others are sketches of contemporary manners; there are also rhetorical and biographical pieces, romances and poems. *Verae Historiae* is a burlesque adventure-story. *Macrobi* contains stories of men who lived to a great age, its authenticity is doubtful.
- LUCRÆTIUS, Roman poet, 1st century B.C. His *De Rerum Natura*, poem in hexameter verse, expounds the doctrines of Epicurus and the Atomic School.
- LYCOPHRON of Chalcis in Euboea, 3rd century B.C. Greek scholar and poet, lived at Alexandria under Ptolemy Philadelphus (285-247 B.C.). Of his works, only his *Cassandra* or *Alexander* is extant, a versified recital of legendary history beginning with Troy and ending with Alexander the Great. He also wrote, in connection with the arrangement of the comic poets in the Library at Alexandria, an essay *On Comedy*.
- LYCURGUS of Athens, 4th century B.C.; Attic orator and statesman. Disciple of Plato and Isocrates, supporter of Demosthenes. Of his orations, only that *Against Leocrates* (delivered 332 B.C.) survives.

LYSIAS, Attic orator, c. 459, or 444 B.C. - 368 B.C. Thirty-four forensic orations are extant, three incomplete, of these five are probably spurious. His speeches are of the highest value for the political and social history of Athens of his time.

MACROBIUS, Greek by birth, place of origin unknown, 4th-5th centuries A.D. Grammarian, wrote in Latin. Extant works *Saturnalia Convivia*, a series of dissertations on history and mythology, in form an imitation of Plato's *Symposium*, *Commentarius ex Cicerone in Somnium Scipionis*, a Neo-Platonist tract based on a discussion of the Dream of Scipio in Cicero, *De Republica*, Book VI, and *De Differentia et Societatibus Graeci et Latini Verbi*, which survives in an abridged form.

MAEANDRIUS (or **LEANDRIUS**) of Miletus, date uncertain, wrote a work called *Parangelma*, a kind of alphabetical guide, and a History of Miletus.

MAGÔ, a Carthaginian of uncertain date (earlier than 150 B.C.), wrote a work on Agriculture in the Punic language, in twenty-eight books, this was translated into Latin by order of the Senate after the destruction of Carthage in 146 B.C., it was later translated in an abridged form into Greek. It was highly valued and much quoted by Roman writers on agriculture such as Varro and Columella.

MALALAS, see **JOANNES MALALAS**.

MALIIUS THEODÔRUS of Rome, 4th century A.D., contemporary of St. Augustine. Wrote a Latin work *De Rerum Natura* (extant), and a work on Metec (lost).

MANETHÔ, an Egyptian, native of Sebennytus and priest of Heliopolis, 4th-3rd centuries B.C. (reign of Ptolemy I and Ptolemy II, 323-247 B.C.) Wrote in Greek a History of Egypt, of great value, and an account of Egyptian religious doctrine entitled *Epitome of Physics*, these survive only in extracts. A work entitled *Apotelesmatika*, an astrological poem (extant) ascribed to Manetho, is now considered to be of later date (5th century A.D.)

MANILIUS, name given in Latin MSS. to the author of *Astronomica*, poem on astrology and astronomy written in the reign of Tiberius (14-37 A.D.)

MARCELLINUS, unknown author of a valuable biography of and commentary on Thucydides (extant), incorporating all previous research, used by Suidas and others.

MARCELLINUS, **AMMIANUS**, see **AMMIANUS**.

MARCUS AURËLIUS ANTONINUS, Emperor of Rome, 161-180 A.D., called 'the Philosopher', followed the Stoic School. He left a book of *Meditations*, moral precepts extracted from the works of others and reflections of his own, in Greek.

- MARMOR PARIUM**, an inscription discovered in the early 17th century in Smyrna and brought to England (now in Oxford), giving dates from earliest times. Dates are reckoned by the number of years that had elapsed before the archonship of Diognetus, 264-263 B.C. The authority for the chronology of the Parian Marble is probably Phantias of Eresos, a pupil of Aristotle (*Corpus Inscr Graec* II 2374, Muller, *Frag Hist Gr* I 535-590. See Sandys, *Ath Pol* p. 52, note).
- MARTIANUS** or **MARCIANUS CAPELLA**, probably of Carthage (Colony), end of 5th century A.D. Author of a compilation of prose and verse, forming an Encyclopaedia of knowledge of the arts and sciences. The material is ill-arranged, but sometimes valuable. The work was popular in the Middle Ages as a manual of education.
- MAXIMUS PLANUDĒS** of Constantinople, early half of 14th century A.D. Learned monk, scholar, rhetorician and theologian. Compiled the latest of the Greek Anthologies, an abridgement of the earlier (10th century) Anthology of Constantinus Cephalas (*Anthologia Palatina*, q.v.). He also wrote grammatical works and translations, and a Life of Aesop with a collection of his fables.
- MAXIMUS TYRIUS**, of Tyre, 2nd century A.D. (period of the Antonines and Commodus), Greek rhetorician and Platonic philosopher. Lived in Greece, and visited Rome. His only extant work is his *Discourses* (*Dissertationes* or *Sermones*), consisting of forty-one essays on philosophical subjects.
- MELAMPŪS**, probably of Alexandria, 3rd century B.C., Greek writer under Ptolemy Philadelphus (285-247 B.C.). Extant works *Divinatio ex Palpitatione* (Divination through Heart-beats) and *De Naevus Oleactis in Corpore*, on Body-Moles, these are of no value except as curiosities.
- MELANTHIUS** of Athens, latter half of 5th century B.C., tragic poet satirized by Aristophanes and others. He also wrote elegies, those on Cimōn and Polygnōtus are quoted as his by Plutarch, though it is possible that the tragic poet Melanthius was not the same as the elegiac poet.
- MENANDER**, 342-291 B.C. Chief poet of New Comedy.
- MENANDER** the rhetorician, *see* GENETHLIUS.
- MENŌN**, pupil of Aristotle, author of a compilation on Medicine, found in a papyrus now in London.
- METRODŌRUS**, native of Lampsacus or Athens, 3rd century B.C. Disciple and friend of Epicurus. His works have survived in quotations only.
- MICHAEL AKOMINATOS**, born 1140 in Phrygia, educated at Constantinople, author of homilies, orations, letters and poems.
- MICHAEL GLYCAS**, 12th century A.D., author of a World Chronicle, from the Creation to the death of Alexius Comnenus (1118 A.D.), as well as theological works, and letters.

- MINYÊS, unknown historian, quoted by Diog. L.
- MIMNERMUS, probably of Smyrna, latter half of 7th century B.C. Elegiac poet, his works survive in fragments only.
- MINUCIUS FÉLIX, MARCUS, of Rome, 3rd century A.D., lawyer. Wrote a dialogue *Octavius*, in defence of Christianity.
- MNÊSIMACHUS, probably of Athens, 4th century B.C. Poet of Middle Comedy, quoted by Athenaeus.
- MOERIS, surnamed Atticista, Greek grammarian of the time of Hadrian (117-138 A.D.) Extant work *Attic Diction*, a comparison of Attic with other Greek dialects.
- MOSCHIÔN, place of origin unknown, poet of late tragedy (period of Alexander of Pherae, 369-367 B.C.) Fragments of his plays are preserved by Stobaeus.
- MÛSDONIUS RUFUS, C., born in Etruria, son of a Roman *eques*, 1st century A.D. Stoic philosopher, wrote philosophical works, which survive in fragments only.
- MYRÔNIÂNUS, of Amastris in Paphlagonia, date uncertain, author of a work in Greek called *Historical Similarities*, quoted by Diog. L.
- NEANTHÊS of Cyzicus, 3rd century B.C., wrote historical and philosophical works, including *Memoirs of King Attalus of Pergamum*, *Hellenica*, *Pythagorica*. These survive in quotations only.
- NEMESIUS, Bishop of Êmêsa in Syria, 4th-5th centuries A.D., Christian philosopher. Wrote a Greek treatise *De Natura Hominis*, which shows considerable medical knowledge as well as philosophical acumen.
- NEOPTOLEMUS of Paros, 3rd century B.C., collected and published a book of Epitaphs.
- NEPÔS, CORNÉLIUS, probably native of Verona, 1st century B.C.-1st century A.D. Contemporary of Cicero and Catullus, died during reign of Augustus. His works are lost, except for extracts; they included *De Viris Illustribus*, comparative lives of Romans and foreigners, *Chronica*, an epitome of world history, and *Lives of Cicero and Cato*.
- NEPTUNALIUS, author of a short treatise on magic methods of healing, etc. The original goes back to the 2nd century A.D. (Ps.-Democritus-Bolus), the existing tract is a Byzantine epitome.
- NICANDER, native of Claros near Colophon in Ionia, 2nd century B.C.; Greek poet, grammarian and physician, succeeded his father as priest of Apollo of Claros. Two poems are extant: *Thêriaca*, on venomous animals and the wounds they inflict, and *Alexipharmaca*, on poisons and their antidotes.
- NICASIRATÊS, place and time uncertain, writer on Democritus mentioned by Philodemus.
- NICOLAUS DAMASCÊNUS, native of Damascus, 1st century B.C.-1st

- century A D (time of Herod the Great and Augustus) He wrote an Autobiography, in part extant, a World History, a Life of Augustus, commentaries on Aristotle, and other philosophical works, as well as tragedies and comedies
- NICOMACHUS, son of Aristotle; was himself a philosopher and wrote works which are lost The *Nicomachean Ethics* of Aristotle was named after him
- NICOMACHUS Gerasenus, of Gerasa in Arabia, 1st century A D Wrote a Life of Pythagoras (lost), and works on arithmetic and music, two of which are extant
- NICOMÉDES, latter half of 3rd century B C Geometer, inventor of the conchoid curve
- NONNUS Abbas, unknown commentator on the works of Gregorius Nazianzen, Bishop of Constantinople 380-390 A.D, probably lived in Palestine in the 6th century A D
- NUMÉNIUS of Apamea in Syria, 2nd century A D, Pythagorean and Platonic philosopher He endeavoured to trace the doctrines of Plato back to Pythagoras, and to compare them with those of the Jews, Magi, Egyptians and Brahmans His writings are lost, but are much quoted by Eusebius and others
- OLYMPIODÔRUS of Alexandria, 6th century A D, Neo-Platonic philosopher Wrote commentaries on Plato and Aristotle His *Life of Plato* is extant, and also his notes on *Gorgias*, *Philébus*, *Phaedo*, and *Alcibiades I*, and on Aristotle's *Metéorologica*
- OLYMPIODÔRUS, unknown author of a work *On the Philosopher's Stone*, may be the same as the historian Olympiodorus who lived at some time after Constantine (306-337 A D) (Not the same as the preceding)
- ORIBASIUS, born in Asia Minor, at Sardis or Pergamum, 4th century A D, Greek medical writer. Extant works *Collecta Medicinalia*, a compilation of medical extracts from other writers, a *Synopsis* of this work, and *Euporista (De Facile Parabilibus)*, on drugs in common use The two latter were intended as manuals for the practice of medicine A Commentary on the Aphorisms of Hippocrates which goes under the name of Oribasius is not his
- ORIGENÊS (ORIGEN) of Alexandria, 2nd-3rd centuries A D, Greek Christian writer, pupil of Clement of Alexandria. His works included editions of the Old Testament in Hebrew; exegetical works, including notes, commentaries and sermons, letters, a work *De Principis* (On First Principles), and a work in eight books, *Contra Celsum*, a defence of Christianity against the attacks of Celsus, an Epicurean
- ORÍON of Thebes, 5th century A.D, Greek grammarian. His *Lexicon*

- is extant, it was used by the compilers of the *Etymologicum Magnum*
- OSTANÊS or OSTHANÊS, the Mede, 5th century B C Said to have accompanied Xerxes to Greece Quoted by later Greek writers on magical remedies
- OVID (P OVIDIUS NASO), 43 B.C -18 A D ; Roman poet
- PACHYMERÊS, GEORGIUS, of Constantinople, 13th-14th centuries A D (c 1242-1310) Extant works *Historia Byzantina*, a History of the Emperors Michael and Andronicus Palaeologus, a valuable work, and summaries of the philosophy of Aristotle. An *Autobiography in verse* is lost
- PALAEPHATUS, author of *De Incredibilibus*, On Incredible Tales; probably an Alexandrian of the 3rd century B C, but this is uncertain His book (in Greek) gave rationalistic explanations of myths, after the style of Euhemerus (4th-3rd centuries B.C.) The existing version is an abridgement of a much larger work which is lost
- PALLADIUS, RUTILIUS TAURUS AEMILIANUS, Latin writer, 4th century A D, author of an extant treatise *De Re Rustica*, derived largely from Columella
- PAMPHILÊ, place of origin Epidauros (Suidas) or Egypt (Photius), woman historian of the 1st century A D (reign of Nero, 54-68 A D) Compiled a historical Miscellany
- PAMPHILUS of Alexandria, probably 1st century A D, author of a Lexicon used by Hesychius and others
- PANAETIUS of Rhodes, 2nd century B C, Stoic philosopher, pupil of Crates at Pergamum, and of Diogenes of Babylon at Athens Went to Rome and became the friend of Scipio Africanus; succeeded to the headship of the Stoic School at Athens. Chief work (lost) *On Moral Obligation*, from which Cicero took the greater part of his *De Officiis*
- PANYASIS of Halicarnassus, 5th century B C, Greek epic poet, relative of Herodotus His poems included *Heraclea*, on the labours of Heracles, and *Ionica*, on the history of the Ionian colonies, these survive in fragments only, in Alexandrian times he was ranked with Homer and Hesiod
- PAPPUS of Alexandria, 4th century A D Geometer His *Mathematical Collections* survives in part
- PARMENISCUS, probably 2nd century B C, grammarian and commentator on Aratus, quoted by Hyginus, by Scholiasts on Homer and Euripides, and by lexicographers.
- PAUSANIAS, perhaps of Lydia, 2nd century A D (reigns of Antoninus Pius and Marcus Aurelius). Wrote *Itinerary of Greece* containing much antiquarian and mythological lore.

- PERSÆUS**, native of Citium in Cyprus, 3rd century B C Stoic philosopher, pupil of Zeno, lived at court of Antigonos Gonatas (277-239 B C)
- PERSEUS**, date and place unknown, probably 3rd century B C. Known only from references in Proclus, as discoverer of spiric sections.
- PETRŌNIUS**, surnamed Arbiter, of Rome, 1st century A D. (reign of Nero), wrote a *Satyricon*, satirical adventure-story in prose and verse, depicting the vices of the age, of its twenty books, parts of Books XV and XVI are extant, including the *Supper of Trimalchio*
- PHANIAS** of Eresos in Lesbos, 4th century B C, pupil of Aristotle and friend of Theophrastus. Wrote many works (all lost) including a *Prytanæus Eresios*, a Chronicle of Eresos, quoted by later writers, *see also under MARMOR PARIUM*
- PHANOCLES**, Greek elegiac poet, latter half of 4th century B C, wrote poem entitled *Erôtês* (*Loves*), of which a fragment survives
- PHANODICUS**, place and time uncertain, wrote *Delica*, a history of Delos
- PHERECYDÊS** of Leros and Athens, early half of 5th century B C Chief work history of Attic mythology and antiquities, surviving in fragments only
- PHILÊMŌN**, native of Soloi in Cilicia, lived at Athens, 4th century B C; poet of New Comedy
- PHILIPPUS** Comicus, place and date unknown, writer of comedies
- PHILIPPUS** of Opus in Locris, 4th century B C, pupil of Plato. Edited Plato's *Laws*, dividing it into twelve books, and adding the thirteenth (*Epinomis*)
- PHILŌ JUDÆUS** (the Jew), of Alexandria, 1st century B C - 1st century A D Wrote commentaries on the books of Moses, endeavoured to prove that the truths of Greek philosophy were derived from the teachings of Moses, influenced the Gnostics and Neo-Platonists
- PHILŌ BYBLIUS** SANCHUNIATHON, a writer named Philo, of Byblos in Phoenicia, who translated into Greek the writings of an ancient Phoenician named Sanchuniathon, at some time before Porphyry (3rd century A D) The work concerned Phoenician mythology Of this translation Eusebius gives the Preface and extracts, which he took from Porphyry This Philo has by some been identified with Herennius Philo (*q v*), who also was called Byblius, but the identification is probably mistaken
- PHILŌ** Mechanicus, of Byzantium, 2nd century B C, wrote a work on military engineering, of which the fourth and fifth books are extant To him is also attributed a work On the Seven Wonders of the World
- PHILOCHORUS** of Athens, 3rd century B C Wrote an *Atthis* or history of Attica, much quoted by later scholars.
- PHILODÊMUS** of Gadara in Palestine, 1st century B C, Greek Epicurean philosopher and poet, lived at Rome in the time of Cicero. Wrote

epigrams (included in the Greek Anthology), and prose works on ethical subjects such as piety (*De Pietate*), anger (*De Ira*), death (*De Morte*), flattery (*De Adulatione*) A treatise of his *On Music* was discovered at Herculaneum

PHILOPONUS, see JÔANNÊS PHILOPONUS

PHILOSTRATUS, FLAVIUS, of Athens, 2nd-3rd centuries A D, studied and taught at Athens Extant works *Life of Apollonius of Tyana*; *Lives of the Sophists*, *Heroica*, an account in dialogue form of the heroes of the Trojan War; *Imagines*, an account of certain paintings, and a collection of seventy-three Epistles, mostly love-letters.

PHILOXENUS of Sidon, annotator of the *Odyssey*, quoted by Eustathius (12th century A D)

PHILŪMENUS, place unknown, date, in or before the 4th century A D., Greek physician and medical writer His works are lost except for numerous quotations in Aetius and others

PHLEGŌN of Trallēs in Lydia, 1st-2nd centuries A D (reign of Hadrian, 117-138 A D) Extant works *On Marvellous Events*, and *Macrobius*, On men who lived to a great age His other works included *Olympiades*, history of the Olympiads from Ol 1 (776 B C) to Ol 229 (137 A D) A *Life of Hadrian*, written by the Emperor, was published under Phlegon's name

PHŌTIUS of Constantinople, 9th century A D, elected Patriarch in 858 A D Extant works *Myriobiblon seu Bibliotheca*, a review of Greek literature containing extracts from 280 volumes, and a *Lexicon* (imperfectly preserved) He was a scholar of immense learning and excellent judgement

PHRYNICHUS, an Arabian or Bithynian, 2nd century A D (under Marcus Aurelius and Commodus) His great work was *Praeparatio Sophistica* in thirty-seven books, of which an extract is preserved He also compiled a *Lexicon* of Attic words and phrases

PINDAR of Thebes, 6th-5th centuries B C His great Epinician Odes preserve many legends or forms of legends otherwise not known

PISANDER of Cameirus in Rhodes, 7th century B C. Wrote *Heraclea*, a poem on the exploits of Heracles

PLANŪDÊS, see MAXIMUS PLANŪDÊS

PLATO, 428-347 B C Friend and disciple of Socrates Founder of the Academic School at Athens. His works, in dialogue form, cover the whole field of knowledge and offer solutions of the problems discussed by the pre-Socratic philosophers

PLATO Comicus, of Athens, 428-389 B C, poet of Old Comedy

PLINY (C. Plinius Secundus) the Elder, of Rome, 23-79 A D Author of *Historia Naturalis*, a collection of 20,000 matters of importance relating to the sciences, drawn from 100 selected authors, together with his own comments

- PLÔTÎNUS**, born at Lycopolis in Egypt, later lived at Rome; founder of the Neo-Platonic system of thought Friend of Porphyry Wrote a work in fifty-four books, which Porphyry divided into *Enneads* or groups of nine, this recorded the subject-matter of their discussions, and other teachings.
- PLUTARCH** of Chaeronea in Boeotia, 1st-2nd centuries A D Extant works *Parallel Lives* of forty-six Greeks and Romans, and *Moralia*, essays on ethical, critical and historical subjects.
- POLLUX**, Julius, of Naucratis in Egypt, 2nd century A D ; Greek scholar and teacher, appointed by the Emperor Commodus (A D 180-192) to the Chair of Rhetoric at Athens His only surviving work, *Onomastikon*, a lexicon in 10 books, is of great value as preserving much information which would otherwise have been lost.
- POLYAENUS** of Macedonia, 2nd century A D Extant work. *On Stratagems*, on the technique of warfare, with anecdotes of well-known men, the book is of little historical worth
- POLYBIUS** of Megalopolis in Arcadia, 2nd century B C Wrote a History in forty books, of which the first five, and extracts from the rest, survive The History began at 264 B C (the First Punic War), and ended at 146 B C (the fall of Corinth), it is of the highest value, containing original material and personal information collected with diligence and accuracy
- PORPHYRIÔ**, **POMPÔNIUS**, 3rd or 4th century A D , commentator on Horace Neo-Platonist philosopher
- PORPHYRIUS** (**PORPHYRY**), probably of Tyre, 233-305 A D Studied under Origen at Caesarea, settled at Rome and became pupil of Plotinus, moved to Sicily where he wrote a treatise against the Christian religion, in fifteen books, this was destroyed by order of the Emperor Theodosius (378-395 A D) His extant works include a *Life of Pythagoras* and a *Life of Plotinus*, a Commentary on the *Categories* of Aristotle, a Commentary on the *Harmonica* of Ptolemy, Scholia on the *Iliad*, a treatise *De Antro Nympharum*, on the Cave of the Nymphs in the *Odyssey*, an allegorical interpretation, and a portion of a treatise *De Styge*, on the Styx
- POSEIDIPPUS** of Alexandria, 3rd century B C , writer of epigrams, some of which were included in the Garland of Meleager, and the Greek Anthology
- POSEIDÔNÎUS** of Apamia in Syria, 2nd-1st centuries B C , studied at Athens under Panaetius, settled at Rhodes, where he became head of the Stoic School, finally moved to Rome He wrote a large number of works on philosophy, astronomy, geography, religion, divination, grammar, history, etc., of which he had considerable knowledge, these survive in fragments only.
- PRISCIANUS** of Caesarea in Mauretania, 6th century A.D , Latin gram-

- marian. His extant works include: *Commentary Grammatici* in eighteen books, which became the standard work on Latin grammar, treatises on grammar, metre, accents, and weights and measures; *De Sideribus*, in verse, and a translation of the *Periægesis* of Dionysius
- PROBUS, VALERIUS, of Bêrytus in Phœnicia, 1st century A D (reign of Nero) Published annotated editions of Lucretius, Vergil, Horace and Persius.
- PROCIUS of Byzantium, 5th century A D, Neo-Platonic philosopher. Studied at Alexandria and Athens Extant wholly or in part are his commentaries on the dialogues of Plato (*Timæus*, *Cratylus*, *Parmenides*, *Republic*), on Hesiod's *Works and Days*, and on Euclid, Book I.
- PSSELLUS, Michael Constantius (The Younger), of Constantinople, 1020-1105 A D, taught philosophy, rhetoric and dialectics Wrote prose and poetry on various subjects, including philosophy, mathematics, law, ethics, history, etc Among his works are: *De Omnisfaria Doctrina*, and an essay *De Lapidum Virtutibus*, on the properties of precious stones
- PTOLEMAEUS, CLAUDIUS, of Alexandria, 2nd century A D, wrote a work on Astronomy, usually known by its Arabic name *Almagest*, *Tetrabiblus*, on Astrology, a Geography of the World in eight books, a catalogue of places with their longitude and latitude, a *Canon* of Rulers, giving a list of Assyrian, Persian, Greek and Roman rulers, and other astronomical works.
- QUINTILIÂNUS, M FABIVS (QUINTILIAN), born in Spain, 35 A D; educated at Rome Author of the *Institutio Oratoria*, a treatise on rhetorical education in twelve books, with much excellent literary criticism.
- RUFUS of Ephesus, 1st-2nd centuries A D (reign of Trajan, 98-117 A D), Greek physician His treatise *De Appellationibus Partium Corporis Humani*, on the naming of the parts of the human body, is extant, as well as essays *On the Kidneys* and *On Purgatives*
- SABÎNUS, end of 1st century A D, physician and commentator on Hippocrates, quoted by Galen and others
- SABÎNUS, 2nd century A D, lived at Rome under Hadrian (A.D. 117-138); wrote a work on Rhetoric in 4 books, and Commentaries on Acusilaus, Thucydides and others
- SATYRUS, perhaps of Alexandria, 3rd century B C (reign of Ptolemy Philopator, 222-205 B C), Peripatetic philosopher and historian Wrote a collection of biographies, including Lives of Philip and Demosthenes
- SCYLAX of Caryander in Caria, 6th-5th centuries B C, early explorer. Was sent by Darius Hystaspes (521-485 B C) to explore the

- course of the River Indus (Hdt IV 44) A work entitled *Periplús* or Voyage Round (the inhabited coasts of Europe, Asia and Libya), is extant under the name of Scylax, but was written later, probably in the first half of the 4th century B C
- SCYMNUS of Chios, date uncertain Wrote a *Periegesis* or description of the earth, in prose
- SCYTHÎNUS of Teos, probably 4th century B C He turned the writings of Heraclitus into iambic verse, of which an extract is preserved by Stobaeus
- SELEUCUS of Alexandria, date uncertain, Greek grammarian, taught at Rome Wrote commentaries on the poets, especially Homer, as well as grammatical and other treatises
- SÊMONIDES of Amorgos, 7th century B C., iambic poet A fragment satirizing women survives
- SÊMUS, probably of Delos, date uncertain, Greek grammarian Wrote historical works, including *Delica*
- SENECA, ANNAEUS, (*Rhetor*), born at Corduba about 61 B C Lived partly in Spain, partly at Rome Extant works *Controversiae* (five books out of ten), and *Suasoriae*, rhetorical exercises on imaginary questions
- SENECA, L. ANNAEUS (*Philosophus*), son of Seneca the rhetorician, born probably a few years B C, wrote numerous essays on ethical questions, many of which are extant, *Apocolocyntosis*, a satire on the Emperor Claudius, *Quaestiones Naturales*, a collection of facts concerning natural phenomena, taken from other writers, with moral comments, tragedies, and *Epistolae ad Lucilium*, one hundred and twenty-four moral discourses in the form of letters
- SERÊNUS SAMMONICUS, lived at Rome, early half of 3rd century A D, scholar renowned for his learning Extant *De Medicina Praecepta Saluberrima* (Medical Prescriptions), a hexameter poem on natural history and the healing art, containing information from the best authorities mixed up with superstitions
- SERVIUS MAURUS HONORÂTUS, 4th century A D Lived at Rome Chief works, a commentary on Vergil, and other grammatical treatises. The original commentary has come down to us with additions by later scholars
- SEXTUS EMPÎRICUS, place of origin unknown, 3rd century A D, contemporary of Galen, Greek physician and Sceptic philosopher Extant works *Pyrrhoniae Hypotypôses* (Outlines of the Pyrrhonic Philosophy), an account of the doctrines of the Sceptic School, and *Adversus Mathematicos*, an attack on positive philosophy science, logic and ethics
- SÎDONIUS APOLLINÂRIS, born at Lyons, 5th century A D, visited Rome Latin poet. Extant works twenty-four *Carmina*, and nine books of Letters on politics, literature and private topics

- SILÊNUS, native of Calatia in Campania, 2nd century B C ; writer on Roman and Sicilian history
- SIMEÔN SÊTH or SÊTHUS, of Constantinople, 11th century A D , Greek medical writer Extant works Catalogue of Foods fit for human consumption, Compendium of scientific and philosophical doctrines, treatises on Medicine, and on the senses of smell, taste and touch; and a Greek version of the Fables of Bidpai (*Coronarius et Vestigator*), a work said to have been brought from India by Perzoe, physician to Chosroës I of Persia (531-579 A D)
- SIMÔN (*Hippiatricus*), probably of Athens, 5th century B C , writer on horses, quoted by Xenophon, *De Re Equestri*
- SIMÔNIDES of Ceos, born 556 B C , lyric poet
- SIMPLICIUS, native of Cilicia, 6th century A D , Neo-Platonist philosopher. Took refuge at the Court of King Chosroes of Persia (531-579 A D) from the persecution of Justinian Extant works commentaries on the *Categories*, *De Caelo*, *Physica Auscultatio* (*Physics*), and *De Anima* of Aristotle
- SOLINUS, C JULIUS, probably 3rd century A D Wrote *Collectanea Rerum Memorabilium*, which was later (6th century) revised and called *Polyhistor*, a geographical compendium
- SOLÔN of Athens, Archon 594 B C , statesman, lawgiver and poet
- SÔPATER of Apamea or Alexandria, 5th century A D Rhetorician and teacher Wrote a commentary on Hermogenes, *Prolegomena* to Aristeides, and a series of rhetorical exercises
- SOPHOCLES, 495-406 B C
- SÔRANUS, date and place uncertain, author of a work on Gynaecology; he may be Soranus of Ephesus the Younger, who lived at some time later than the first half of the 2nd century A D
- SÔSIADÊS, unknown author of a collection of Sayings of the Seven Sages.
- SÔSIBIUS of Sparta, 3rd century B C , lived at Alexandria (reign of Ptolemy Philadelphus (285-247 B C)), Greek grammarian, wrote historical and chronological works
- SÔSICRATÊS of Rhodes, 2nd century A D , historical and philosophical writer quoted by Diog L , author of a work called *The Succession* (*Diadochê*) of the Philosophers, and probably of a History of Crete
- SÔTIÔN of Alexandria, 3rd century B C , wrote a *Diadochai* (*Successions of the Philosophers*)
- SÔTIÔN of Alexandria, 1st century A D , Stoic philosopher Wrote a treatise *De Ira*
- SPEUMPPUS of Athens, 4th century B C , nephew of Plato Succeeded Plato as head of the Academy Wrote works (lost) in support of Plato's doctrines, on the Philosophers, and on Pythagorean Numbers

- SPHAERUS**, probably native of the Bosphorus country, lived at Alexandria, 4th-3rd centuries B C (reigns of Ptolemy I and Ptolemy II (323-247 B C)), Stoic philosopher, pupil of Zeno. Wrote philosophical works on the Atomic Theory, on Heracleitus; and on various topics such as sense-perception, politics, divination and ethics, these are lost
- STATIUS**, P PAPINIUS, lived at Rome, 1st century A.D. Extant works: *Silvae*, collection of occasional poems, *Thebais* and *Achilleis*, two epic poems on the Seven Against Thebes and on Achilles
- STEPHANUS Byzantius**, of Constantinople, probably 4th century A D Wrote *Ethnica*, a geographical lexicon preserved in an epitome made in the reign of Justinian II (527-565 A D)
- STÉSIMBROTOS** of Thasos, 5th century B C, rhapsodist and historian. Wrote works on Homer, on the Mysteries, and on historical subjects He was praised by Plato and Xenophon, and quoted by Plutarch
- STOBAEUS**, JOANNÊS, probably native of Stobi in Macedonia, date uncertain later than Hieroclês of Alexandria (middle 5th century A D) whom he quotes Author of a valuable collection of extracts from Greek writers, this is extant in two parts *Eclogae Physicae*, *Dialecticae et Ethicae*, and *Florilegium* or *Sermônes*
- STRABO** of Amasis in Pontus, c 54 B C-24 A D His work *Geographica* is extant, a historical geography of great value
- SUETONIUS** (C SUETONIUS TRANQUILLUS), 1st-2nd centuries A D, Roman historian, for a time private secretary to the Emperor Hadrian (117-138 A.D.) Extant works *Vitae Duodecim Caesarum*, Lives of the Emperors from Julius Caesar to Domitian, *De Illustribus Grammaticis*, *De Claris Rhetoribus*, and Lives of Terence, Horace, Lucan and the Elder Pliny. A lost work was *Prata* (*Meadow*), a Miscellany of facts on natural history, antiquities, etc
- SUIDAS** a Greek Lexicon under this name is extant, nothing is known of its author He was probably a Byzantine of the 10th century A D The work is ill-arranged, but valuable material is preserved in it.
- SYMMACHUS**, Q AURELIUS, educated in Gaul, lived in Italy and Africa, latter half of 4th century A D, scholar, statesman and orator. Extant works. Epistles in ten books, and *Novem Oratorum Fragmenta*, parts of nine orations, first published in 1815 He also wrote verse
- SYNCELLUS**, GEORGIUS, of Constantinople, 8th-9th centuries A D. Author of a *Chronography* giving principal events from Adam to the accession of Diocletian, 284 A D He intended to bring the work down to 800 A D, but died before he could do so (806 A D), it was completed by his friend Theophanês, who brought it down to 813 A D Syncellus transcribed in part the *Chronicon* of Eusebius

- SYNESIUS, native of Cyrene, 4th-5th centuries A.D.; Greek philosopher, scholar, orator and poet, studied at Alexandria under Hypatia. At first followed Neo-Platonism, but was later converted to Christianity and became Bishop of Ptolemais in Libya. His extant works include. *Dion*, an account of his devotion to philosophy, *On Monarchy*, addressed to the Emperor Arcadius, *Aegyptius, sive De Providentia*, an indictment of the morals of the time in the form of the legend of Osiris and Typhon, *De Insomniis*, *On Dreams*, as well as letters, orations, homilies and hymns
- SYRIANUS, native of Alexandria, 4th-5th centuries A.D., studied at Athens under Plutarchus the Neo-Platonist, and succeeded him as head of that School, taught Proclus. He wrote commentaries on the works of Aristotle, that on the *Metaphysics* is extant, as well as a commentary on the *Staseis* of Hermogenes (q.v.), and a treatise *On the Ideas*
- TATIANUS, native of Assyria, 2nd century A.D., philosopher and teacher of rhetoric, later converted to Christianity by Justin Martyr. His extant work (in Greek) is *Oratio adversus Graecos*, an admonitory address to the Greeks reproving them for their contempt for the opinions of non-Hellenes. His other works survive in fragments only
- TELÊS, place of origin possibly Alexandria, 4th-3rd centuries B.C.; Greek Socratic philosopher. Wrote dialogues, quoted by Stobaeus, on ethical subjects
- TERPANDROS (TERPANDER) of Lesbos, Greek lyric poet, 7th century B.C. Lived at Sparta, introduced a new type of music. A few fragments of his lyrics survive
- TERTULLIANUS (TERTULLIAN), native of Carthage, 2nd-3rd centuries A.D., Christian writer, who seceded from the Roman Church and joined the heretical sect called Montanists, wrote works before and after his secession, many of which are extant. The *De Anima* and *De Corona Militis* were written after his secession, the period at which he wrote his *Apologia*, a general defence of Christianity, and *Ad Nationes*, an attack on the persecutors of the Christians, is not known.
- THEMISTIUS of Paphlagonia, 4th century A.D., lived at Constantinople and Rome, Greek philosopher and rhetorician, friend of Gregorius Nazianzen. Of his thirty-six Political Orations, thirty-four are extant in the original, and one in a Latin version, they deal with current events. He also wrote philosophical works, including a commentary on all the books of Aristotle, with paraphrases of the *Physics*, *Analytics*, *Categories* and others
- THEÔ of Smyrna, early 2nd century A.D. (reign of Hadrian, 117-138 A.D.), Platonic philosopher, astronomer and mathematician.

- Extant work, *Mathematical Aids to the Understanding of Plato*, in two books, one on arithmetic, one on music
- THEOCRITUS of CÔs or Syracuse, early half of 3rd century B C, Greek bucolic poet. Lived at Alexandria in the reign of Ptolemy II (285-247 B.C.) and at Syracuse in the reign of Hiero II (270-216 B.C.)
- THEOCRITUS of Chios, latter half of 4th century B C (reign of Alexander the Great, 336-323 B.C.) Rhetorician and epigrammatist. Wrote *Sententiae*, maxims or witty sayings, and *Epistulae de Rebus Mirabilibus*. A History of Libya is also attributed to him.
- THEODÔRËTUS, native of Antioch, 5th century A.D., Greek ecclesiastic and scholar. Wrote commentaries on the books of the Old Testament, and on the Epistles of Paul, a valuable *Ecclesiastical History Religiosa Historia*, containing the Lives of thirty hermits, tracts against heresies; *Graecorum affectionum Curatio* (A Remedy for the Ills of Greece), a defence and exposition of Christian doctrine, ten Orationes on Providence, and other Orationes, homilies and letters.
- THEODÔRUS of Cyrene ('the Atheist'), 4th-3rd centuries B.C., pupil of Aristippus the Younger. Lived also at Athens (under Demetrius Phalereus) and at Alexandria (under Ptolemy Lagi, 323-285 B.C.). Wrote a book *On the Gods* (lost).
- THEODÔRUS PRISCUS or PRISCIANUS, of Constantinople, 4th century A.D., physician. Extant work (Latin) *Res Medicae*, on general medical practice and treatment.
- THEODÔRUS PRODROMUS, Greek monk, 12th century A.D. Wrote works in prose and verse, many of which are extant, these include *Galeomyomachia*, the Battle of the Cats and Mice, in imitation of the Homeric *Batrachomyomachia*, a love-story in verse, and *Epigrammata*, poetical summaries of the Scriptures.
- THEOGNIS of Megara, 6th century B.C., elegiac poet.
- THEOGNÔSTUS of Constantinople, early half of 9th century A.D., grammarian. Author of a work on prosody, partly based on that of Herodianus (q.v.).
- THEOPHILUS of Antioch, latter half of 2nd century A.D. Was converted to Christianity, and became Bishop of Antioch, c. 170 A.D. Wrote a Defence (extant) of the Christian faith, in the form of a *Letter to Autolycus* (his friend), and commentaries on the Scriptures.
- THEOPHRASTUS, of Eresos in Lesbos, 4th century B.C.; pupil and friend of Aristotle, whom he succeeded as head of the Peripatetic School at Athens. Diogenes Laertius gives a list of his writings. His chief works (extant) were *Historia Plantarum*, and *De Causis Plantarum*, on botany, and *Characters*, other works survive in fragments only, e.g. *De Sensu*, *De Odoribus*, *De Vertigine* (On

Faintness), *De Igne*, *De Petrus*, *Metaphysics* and other ethical and philosophical treatises. The work *De Signis*, on Meteorology, ascribed to him, is now thought to be spurious.

THEOPHYLACTUS of Constantinople, 7th century A D. Extant works. History of the Emperor Maurice (582-602 A D), *Quaestiones Physicae*, on the nature of animals, especially Man, and eighty-five Letters.

THEOPOMPUS of Chios, 4th century B C, pupil of Isocrates, Greek historian and rhetorician. His works survive in fragments only. *History of Greece*, a continuation of that of Thucydides from 411 to 394 B C, *Philippica*, History of Philip of Macedon, 360-336 B C, and Orations written for display.

THRASYLLUS of Mendes and Alexandria, astrologer to Tiberius (14-27 A D), also Platonic scholar and mathematician. Probably with Dercyllides divided Plato's works into Tetralogies, and was credited with a similar division of the works of Democritus. Wrote on Platonic and Pythagorean philosophy, and on music; a work of his on astrology survives in a Byzantine epitome.

THUCYDIDÊS of Athens, 5th century B C, historian of the Peloponnesian War.

TIMAEUS of Tauromenium in Sicily, c. 352-256 B C, son of Andromachus, tyrant of Tauromenium. Wrote a History of Sicily from earliest times to 264 B C, which survives in fragments only. He collected materials with care, but his reliability was disputed by Polybius, who began his own History at 264 B C.

TIMÔN of Phlius, 3rd century B C, studied philosophy under Pyrrho of Elis and Stilpo of Megara (Sceptic School). Visited various cities, and lived for a time at Athens. Wrote *Silloi*, hexameter verses in three books, of which the latter two are in the form of a dialogue between the poet and Xenophanes; the work is a satirical account of the doctrines of all philosophers.

TIMOTHEUS of Miletus, 446-357 B C, musician and dithyrambic poet. His works survive in fragments only, the title of one of his dithyrambs was *Persae*.

TIMOTHEUS of Rhodes, 3rd century B C, admiral of the fleet of Ptolemy Philadelphus (285-247 B C). Wrote a work on *Harbours* in 10 books, copied by Eratosthenes and quoted by Strabo and others.

TIMOTHEUS of Gaza, latter half of 5th century A D (reign of Emperor Anastasius, 491-518 A D), Greek grammarian. Wrote a poem in epic verse, on the quadrupeds of India, Arabia, Libya and Egypt, and on strange birds and serpents, and a tragedy *Chryseargyros* of which nothing survives.

TRYPHÔN of Alexandria, 1st century B C - 1st century A D (reign of Augustus, 29 B C - 14 A D), grammarian and poet.

TZETZÊS, see JOANNÊS TZETZÊS.

- VALERIUS MAXIMUS** of Rome, 1st century A.D. (reign of Tiberius, 14-27 A.D.). Compiler of *De Factis Dictisque Memorabilibus*, historical anecdotes, of which an abridged version survives.
- VARRO, M. TERENTIUS**, 116-28 B.C., Roman scholar and writer. His erudition was famous. Of his works, two only are extant: *De Re Rustica*; and *De Lingua Latina*, originally in twenty books of which six (Books V-X) survive. He also wrote biographies, philosophical and scientific works, and *Saturae*, didactic compositions in verse and prose on various subjects, of which only fragments remain.
- VERGIL** (P. VERGILIUS MARO), 70-19 B.C.
- VESTINUS** of Ioulis in Ceos, date uncertain, grammarian. Epitomized the Lexicon of Pamphilus (1st century A.D.).
- VINDICIANUS** of Rome, 4th century A.D., physician to the Emperor Valentinianus I (364-375 A.D.), tutor to Theodorus Priscus (q.v.). He was a Christian, and was praised by St. Augustine, whom he met in Africa. Wrote a Latin hexameter poem on medicinal substances.
- VITRUVIUS POLLIO, M.**, of Rome, latter half of 1st century B.C., architect. His *De Architectura* is extant.
- XANTHUS** wrote *On Empedocles*, otherwise unknown.
- XENOCRATÉS** of Aphrodisias in Cilicia, 1st century A.D. Medical writer quoted by Galen.
- XENOPHÓN** of Athens, 5th-4th centuries B.C., disciple of Socrates, historian and essayist. Extant works *Anabasis*, *Hellenica*, *Cyropaedea*, *Memorabilia Socratis*, and other essays and dialogues such as *Æconomicus* and *Symposium*. The *Constitution of Athens* ascribed to him is by an older writer, but the *Constitution of Sparta* may be his.
- ZACHARIAS** Scholasticus, 6th century A.D., Greek Christian writer. Studied at Alexandria; became Bishop of Mitylene in Lesbos. Extant work *Ammonius*, a dialogue held with a pupil Ammonius, refuting the Platonic doctrine of the eternity of the universe, as contrary to the Christian faith, and a treatise refuting the Manichean heresy. He also wrote commentaries on Aristotle (lost).
- ZÉNÔ** Stoicus; native of Citium in Cyprus, 3rd century B.C., settled in Athens and founded the Stoic School. Wrote numerous works, which have not survived, but were incorporated in the works of later Stoics.
- ZÔPYRUS** of Heraclea, date unknown, wrote Orphic poems, mentioned by Clemens Alex., Suidas and others.
- ZÔROASTER** (ZARATHUSTRA), date uncertain, founder or reformer of

Magian religion; first mentioned in Greek literature by Plato (*Alab.* 122a) Spurious writings under his name were later current in the time of Pliny, 1st century A D, possibly earlier. A collection of forged oracles is extant

ZÔSIMUS, probably lived at Constantinople, 5th century A D. (reign of Theodosius II, 408-450 A D) Wrote a History of the Roman Empire (extant), from its beginning to 410 A D, largely compiled from the works of previous historians, he was not a Christian, and therefore attacked the crimes of the Christian Emperors, especially Constantine

ZÔSIMUS of Ascalon in Gaza, 5th-6th centuries A D. (reign of Anastasius, 419-518 A D) Wrote Lives of the orators, including Demosthenes, Lysias and Isocrates

ZÔSIMUS the alchemist, of Panopolis in Egypt, probably early 4th century A D, author of a compilation of earlier works on alchemy.

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