Aristotle

Metaphysics

Translated
With Introduction and Notes
By

C. D. C. Reeve

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Preface

Readers of the *Metaphysics* in translation often find themselves in territory whose apparent familiarity is somewhat deceptive and inimical to proper understanding. *Epistêmê* isn't quite science, *theôria* isn't quite theory, *aition* isn't quite cause, *archê* isn't quite first principle, *ousia* isn't quite substance, *to on* isn't quite being, *to ti ên einai* isn't quite essence. Even what the *Metaphysics* is about isn't quite metaphysics as we know it. A worthwhile translation must try to compensate for this deceptive familiarity without producing too much potentially alienating distance and strangeness in its place.

Accuracy and consistency are essential to achieving this goal, obviously, but so too are extensive annotation and commentary. Some of this can consist, as it does here, of texts selected from other works by Aristotle himself, so that, while traveling through the region of the Aristotelian world the *Metaphysics* describes, the reader can also travel through other regions of it, acquiring an ever widening and deepening grasp on the whole—something that is crucial, in my view, to understanding any part of it adequately or, perhaps, at all. But much commentary must simply be explanatory, clarificatory, and interpretative.

To make the journey as convenient as possible footnotes and glossary entries are replaced by sequentially numbered endnotes, so that the information most needed at each juncture is available in a single place. The non-sequential reader, interested in a particular passage, will find in the detailed Index of Terms a guide to places where focused discussion of a term or notion occurs. The Glossary shows key Greek terms and their English equivalents. The Introduction describes the book that lies ahead, explaining what it is about, what it is trying to do, how it goes about doing it, and what sort of audience it presupposes. It isn't a comprehensive discussion of all the important topics in the *Metaphysics*, nor an attempt to situate Aristotle's thought in the history of metaphysics more generally. Many books exist that attempt these tasks, some of which are mentioned under Further Reading. Nor is it, I should add, an expression of scholarly consensus on the issues it does discuss—insofar as such a thing exists—but my own take on them. The same goes for many of the more interpretative notes. They are a place to start, not a place to finish—a first step in the vast dialectical enterprise of coming to understand Aristotle for oneself.

Some readers will, I have assumed, be new to the *Metaphysics*, without much background in philosophy generally or in Ancient Greek philosophy in particular, so I have tried to keep their needs in mind. I have also had in mind, though, the needs of more advanced readers, who require an English version that is sufficiently reliable and informed for their purposes.

I have benefited from the work of previous translators and commentators, especially David Ross, whose magisterial edition of the Greek text, commentary on it, and translation of it have been essential. The various volumes in the Clarendon Aristotle Series have also often been helpful, as have the Symposium Aristotelicum volumes devoted to Books Alpha, Beta, and Lambda, the edition of Book Zeta with German translation by Michael Frede and Günther Patzig, the "map" of Zeta by Myles Burnyeat, and the translations of Zeta, Eta, Theta, and Iota by Montgomery Furth.

As in the case of my translation of the *Nicomachean Ethics* (Indianapolis, 2014), I am deeply indebted to my friend Pavlos Kontos for reading every line of this one, suggesting numerous improvements, and correcting many errors. I am also indebted to David Riesbeck for his very careful reading of the translation and for his many, always perceptive, notes and comments. I'm indebted, too, to Michael Smith for spotting many typos in the penultimate draft. Finally, I am very happy to thank my co-editor of *Readings in Ancient Greek Philosophy*, Marc Cohen, for reading much more of the *Metaphysics* than appears in that volume and making numerous helpful suggestions.

Equal devotion to Greek philosophical texts, albeit of a different sort, has again been demonstrated by Deborah Wilkes and her colleagues at Hackett Publishing Company, who have been my publishers, supporters, and friends for over twenty-five years.

While I was at work on the *Metaphysics* I had the good fortune to teach a joint seminar on it with Mariska Leunissen and to profit from discussions with her, with other members of the seminar, and with Michael Peramatzsis, our guest speaker. I am grateful to Marc Lange, chair of the Philosophy Department of the University of North Carolina at Chapel Hill, for providing funds to bring Michael to the seminar and for his many other kindnesses. I am grateful, too, to Panos Dimas for inviting me to attend the twentieth Aristotelian meeting of the European Society of Ancient Philosophy in Athens (April 2104), which was devoted to Zeta 10 and 11, and to present there some of what now appears in the notes to $1034^{b}20$–$1035^{a}25$.

I renew my thanks to ΔKE, the first fraternity in the United States to endow a professorial chair, and to the University of North Carolina for

awarding it to me. The generous research funds, among other things, that the endowment makes available each year have allowed me to travel to conferences and to acquire books, computers, and other research materials and assistance, without which my work would have been much more difficult.

Abbreviations

Aristotle

Citations of Aristotle's works are made to Immanuel Bekker, *Aristotelis Opera* (Berlin: 1831 [1970]), in the canonical form of abbreviated title, book number (when the work is divided into books), chapter number, page number, column letter, and line number. In the case of the *Metaphysics*, however, Greek letters replace book numbers, as is most common, and the title of the work is omitted. An * indicates a work whose authenticity has been seriously questioned, ** indicates a work attributed to Aristotle but generally agreed not to be by him. The abbreviations used are as follows:

APo.	*Posterior Analytics*
APr.	*Prior Analytics*
Cael.	*De Caelo (On the Heavens)*
Cat.	*Categories*
DA	*De Anima (On the Soul)*
Div. Somn.	*On Divination in Sleep* (Ross)
EE	*Eudemian Ethics*
GA	*Generation of Animals*
GC	*On Generation and Corruption* (Joachim)
HA	*History of Animals* (Balme)
IA	*Progression of Animals (De Incessu Animalium)*
Int.	*De Interpretatione*
Juv.	*On Youth and Old Age, Life and Death, and Respiration* (Ross)
LI	*On Indivisible Lines***
Long.	*On Length and Shortness of Life* (Ross)
MA	*Movement of Animals* (Nussbaum)
MM	*Magna Moralia** (Susemihl)

Mech.	*Mechanics***
Mem.	*On Memory* (Ross)
Mete.	*Meteorology*
NE	*Nicomachean Ethics*
Oec.	*Economics**
PA	*Parts of Animals*
Ph.	*Physics*
Po.	*Poetics*
Pol.	*Politics*
Pr.	*Problems**
Protr.	*Protrepticus* (Düring)
Rh.	*Rhetoric*
SE	*Sophistical Refutations*
Sens.	*Sense and Sensibilia*
Somn.	*On Sleep*
Top.	*Topics*

I cite and translate the *Oxford Classical Texts* (OCT) editions of these works, where available, otherwise Bekker or the editions noted:

Balme, D. M., *Aristotle: Historia Animalium* (Cambridge, 2002).

Düring, Ingemar, *Aristotle's Protrepticus: An Attempt at Reconstruction* (Göteborg, 1961).

Joachim, H. H., *Aristotle on Coming-to-Be and Passing-Away* (Oxford, 1926).

Mayhew, Robert, *Aristotle: Problems* (Cambridge, Mass., 2011).

Nussbaum, Martha C., *Aristotle's De Motu Animalium: Text with Translation, Commentary, and Interpretative Essays* (Princeton, 1978).

Rose, V., *Aristotelis Fragmenta* 3rd ed. (Leipzig, 1886).

Ross, W. D., *Aristotle Parva Naturalia* (Oxford, 1955).

Susemihl, F., *Aristotelis Magna Moralia* (Leipzig, 1883).

Plato

Ap.	*Apology*
Chrm.	*Charmides*
Crat.	*Cratylus*
Epin.	*Epinomis*
Euthd.	*Euthydemus*
Euthphr.	*Euthyphro*
Grg.	*Gorgias*
Hp. Mi.	*Hippias Minor*
Lg.	*Laws*
Men.	*Meno*
Phd.	*Phaedo*
Phlb.	*Philebus*
Pol.	*Statesman*
Prm.	*Parmenides*
Phdr.	*Phaedrus*
Prt.	*Protagoras*
Rep.	*Republic*
Smp.	*Symposium*
Sph.	*Sophist*
Tht.	*Theaetetus*
Ti.	*Timaeus*

Translations of Plato in the notes are based on those in J. M. Cooper, ed., *Plato: Complete Works* (Indianapolis, 1997) and on my *The Trials of Socrates* (Indianapolis, 2002) and *Plato: Republic* (Indianapolis, 2004).

Other Abbreviations and Symbols

Alex. *In. Metaph.* = Haydruck, M. ed. *Alexandri Aphrodisiensis in Aristotelis Metaphysica Commentaria* (Berlin, 1891).

Annas = J. Annas, *Aristotle's Metaphysics Books M and N* (Oxford, 1976).

Barker = A. Barker, *Greek Musical Writings II: Harmonic and Acoustic Theory* (Cambridge, 1989).

Barnes = J. Barnes, *The Complete Works of Aristotle: The Revised Oxford Translation* (Princeton, 1984).

Bostock = D. Bostock, *Aristotle Metaphysics Books Z and H* (Oxford, 1994).

DK = H. Diels and W. Kranz, eds., *Die Fragmente der Vorsokratiker* 6th ed. (Berlin, 1951).

DL = Diogenes Laertius, *Lives of Eminent Philosophers*, ed. T. Dorandi (Cambridge, 2013).

Dooley 1 = W.E. Dooley, S. J., tr., *Alexander of Aphrodisias, On Aristotle's Metaphysics 1* (Ithaca, 1989).

Dooley 5 = *Alexander of Aphrodisias, On Aristotle's Metaphysics 5* (Ithaca, 1993).

Dooley & Madigan = W. E. Dooley, S. J., and A. Madigan, S. J., tr., *Alexander of Aphrodisias, On Aristotle's Metaphysics 2 & 3* (Ithaca, 1992).

Fine = G. Fine, *On Ideas: Aristotle's Criticism of Plato's Theory of Forms* (Oxford, 1993).

FP = M. Frede and G. Patzig, *Aristoteles Metaphysik Z: Text, Übersetzung und Kommentar* (München, 1988).

Furth = M. Furth, *Aristotle Metaphysics, Books Zeta, Eta, Theta, Iota* (Indianapolis, 1985).

Huffman = C. A. Huffman, *Archytas of Tarentum: Pythagorean, Philosopher and Mathematician King* (Cambridge, 2005).

Isnardi = M. Isnardi Parente and T. Dorandi, *Senocrate e Ermodoro, Testimonianze e Frammenti* (Pisa, 2012).

Laks = André Laks, "*Metaphysics Λ* 7," in M. Frede and D. Charles (eds.), *Aristotle's Metaphysics Lambda* (Oxford, 2000).

Madigan = A. Madigan, S. J., tr., *Alexander of Aphrodisias, On Aristotle's Metaphysics 4* (Ithaca, 1993).

Makin = S. Makin, *Aristotle Metaphysics Books Θ* (Oxford, 2006).

PEM = Principle of Excluded Middle.

PNC = Principle of Non-contradiction.

Primavesi = O. Primavesi, "Metaphysics A: A New Critical Edition with Introduction." In C. Steel (ed.), *Aristotle's Metaphysics Alpha* (Oxford, 2012).

R^3 = V. Rose, *Aristotelis Fragmenta* 3rd ed. (Leipzig, 1886).

Ross = W. D. Ross, *Aristotle's Metaphysics* (Oxford, 1924).

Schiefsky = M. J. Schiefsky, *Hippocrates on Ancient Medicine: Translated with an Introduction and Commentary* (Leiden, 2005).

SSR = G. Giannantoni, *Socratis et Socraticorum Reliquiae* (Naples, 1990).

Tarán = L. Tarán, *Speusippus of Athens* (Leiden, 1981).

TEGP = D. W. Graham, *The Texts of Early Greek Philosophy: The Complete Fragments and Selected Testimonies of the Major Presocratics* (Cambridge, 2010).

West = M. L. West, *Delectus ex Iambis et Elegis Graecis* (Oxford, 1980).

A = B = A is identical to (equivalent to) B.

$A =_{def.} B$ = A is identical to B by definition.

A ≈ B = A is roughly the same as or roughly equivalent or analogous to B.

A ⊃ B = If A then B, or A implies B.

□A = It is necessary that A.

◇A = It is possible that A.

Introduction

Life and Works

Aristotle was born in 384 BC to a well-off family living in the small town of Stagira in northern Greece. His father, Nicomachus, who died while Aristotle was still quite young, was allegedly doctor to King Amyntas of Macedon. His mother, Phaestis, was wealthy in her own right. When Aristotle was seventeen his guardian, Proxenus, sent him to study at Plato's Academy in Athens. He remained there for twenty years, initially as a student, eventually as a researcher and teacher. When Plato died in 347, leaving the Academy in the hands of his nephew, Speusippus, Aristotle left Athens for Assos in Asia Minor, where the ruler, Hermias, was a patron of philosophy. He married Hermias' niece, Pythias, and had a daughter by her, also named Pythias. Three years later, in 345, after Hermias had been killed by the Persians, Aristotle moved to Mytilene on the island of Lesbos, where he met Theophrastus, who was to become his best student and closest colleague.

In 343 Aristotle seems to have been invited by Philip of Macedon to be tutor to the latter's thirteen-year-old son, Alexander, later called "the Great." In 335, Aristotle returned to Athens and founded his own institute, the Lyceum. While he was there his wife died and he established a relationship with Herpyllis, also a native of Stagira. Their son Nicomachus was named for Aristotle's father, and the *Nicomachean Ethics* may, in turn, have been named for him or transcribed by him. In 323 Alexander the Great died, with the result that anti-Macedonian feeling in Athens grew stronger. Perhaps threatened with a formal charge of impiety (*NE* X 7 $1177^{b}33$), Aristotle left for Chalcis in Euboea, where he died twelve months later, in 322, at the age of sixty-two.

Legend has it that Aristotle had slender calves, small eyes, spoke with a lisp, and was "conspicuous by his attire, his rings, and the cut of his hair." His will reveals that he had a sizable estate, a domestic partner, two children, a considerable library, and a large circle of friends. In it Aristotle asks his executors to take special care of Herpyllis. He directs that his slaves be freed "when they come of age" and that the bones of his wife, Pythias, be mixed with his "as she instructed."

Although the surviving writings of Aristotle occupy almost 2,500 tightly printed pages in English, most of them are not works polished for publication but sometimes incomplete lecture notes and working papers. This accounts for some, though not all, of their legendary difficulty. It is unfair to complain, as a Platonist opponent did, that Aristotle "escapes refutation by clothing a perplexing subject in obscure language, using darkness like a squid to make himself hard to catch," but there is darkness and obscurity enough for anyone, even if none of it is intentional. There is also a staggering breadth and depth of intellect. Aristotle made fundamental contributions to a vast range of disciplines, including logic, metaphysics, epistemology, psychology, ethics, politics, rhetoric, aesthetics, zoology, biology, physics, and philosophical and political history. When Dante called him "the master of those who know," he was scarcely exaggerating.

The Metaphysics *and Its Structure*

One thing we might mean by the *Metaphysics* is what we now find in the pages that make up Werner Jaeger's Oxford Classical Text (OCT) edition of the Greek text, first published in 1957, which is the basis of the present translation. This is the descendant of texts derived—via manuscripts copied in the Byzantine period (from the tenth to the fifteenth centuries AD)—from manuscripts that derive in turn from the edition of Aristotle's works produced by Andronicus of Rhodes in the first century BC. Thus Jaeger's edition, like most other modern editions, records in the textual apparatus at the bottom of the page various manuscript readings alternative to the one he prints in the body of his text. In some cases, I have preferred one of these readings, or some other reading suggested by an editor, indicating my preference in the associated notes. It is widely recognized, it should be said, that no entirely satisfactory edition of the Greek text is currently available. Nonetheless, when mss. E and A^b or J and A^b agree, there is some consensus among experts that the text is on safe ground—or is so, anyway, up to Λ 7 1073^a1. At that point, A^b seems to be a copy of a lost manuscript closely related to J, so that E and J on the one hand and M and C on the other become the ones whose agreement renders the ground reasonably safe.*

Also present in Jaeger's text, as in all worthwhile modern editions, are book and chapter divisions provided by editors, as well as the page numbers of Bekker, *Aristotelis Opera*. Here its page numbers, column letters,

*With the exception of C (= Taur. B VII 23 saeculi XV) these manuscripts are identified at OCT p. xxii.

and line numbers appear in the margins in the print edition and, in the electronic edition, between upright lines in the translation itself (for example, |1028ª10|) at the end of the first line in a column to which they apply. Line numbers refer to the Greek text, however, and so are approximate in the translation. Occasional material in square brackets is inserted for purposes of clarification.

The second thing we might mean by the *Metaphysics* is the work itself, so to speak, the more abstract entity that is embodied in a good edition of the Greek text and (ideally) in any translation of it. It is clear, however, even on a first reading, that whatever this work is it is not a polished treatise developing a single line of argument in an immediately perspicuous way.

Book Alpha begins by introducing us to the topic of the work, theoretical wisdom (*sophia*), later the science of being qua being (Γ 1 1003ª21), which is concerned with being as such and with its primary causes and starting-points. It continues (A 3–10) by looking at and criticizing what earlier thinkers (especially, Plato) have said about these, concluding that none of them introduces any beyond the four (material, efficient, final, and formal) that Aristotle has himself identified and explored in the *Physics*. Beta lists and goes through a set of fourteen *aporiai* or puzzles (P1–14) that the science of being qua being must resolve, whose order and content we might expect to be setting the agenda for the rest of the work. Gamma does, to some extent, meet this expectation, since P1–4 are somewhat resolved in Γ 1–2 (although P3, for example, is also discussed in E 1). P5, on the other hand, is not discussed until the final books, Mu and Nu. P6–7 are not explicitly addressed anywhere—although Z 10 and 12 offer help with them, as Z 8, 13–14, M 10 do with P8, and Z 7–10 with P10. P9 is resolved in M 10. P11 is resolved in Z 16 and Iota 2, P12 in Z 13–15 and M 10. P13 is not addressed, though a resolution is suggested in Θ 8. P14, not referred to explicitly, is resolved in M 1–3, 6–9 and N 1–3, 5–6.

Between Alpha and Beta comes Little Alpha, and after Gamma comes Delta, neither of which is in an altogether intelligible place—especially Delta, which as a sort of dictionary of philosophical terms, might more naturally have constituted an appendix or preface to the work as a whole, even though not all of the terms are used in it ("docked," for example), and some are discussed again. Then, after the largely coherent sequence of Epsilon, Zeta, Eta, and Theta, we have Iota, which, though it contains a resolution to P2 and is focused on unity and other central topics bearing on ultimate starting-points, is not directly connected to its predecessors. Next we have Kappa, the first half of which recapitulates parts of Beta, Gamma, and Epsilon, although not in a simply mechanical way, and the second half of which consists of a series of extracts from *Physics* II, III, and V.

The first five chapters of Lambda are connected to (roughly) the last four of Kappa, both serving to refocus the discussion on causes, rather than on the more "logical" or syncategorematic topics in Iota, with Λ 1–5 showing how to introduce a sort of causal uniformity into the causal diversity exemplified by the various natural sciences, each one dealing exclusively with a single genus of beings. The way is thus prepared for Λ 6, with its argument that there must be an eternal immovable substance if there is to be movement or change of any sort. Λ 7 deals with what such a substance moves and how it moves it, identifying the substance itself with the (primary) god. Λ 8 deals with the question of how many unmoved eternal movers we need to posit in order to explain, in the first instance, astronomical phenomena, and, in the second, phenomena elsewhere in the cosmos, including on earth. Λ 9–10 deal with the nature of this god and of the cosmos in which he functions as a prime mover and ruler.

After the dramatic second half of Lambda, Mu and Nu, which focus on mathematical objects, and develop a host of criticisms of Plato and others, can seem anticlimactic to a modern reader—even if we leave aside the fact that M 4–5 repeats A 9 almost word for word. But for an audience of Platonists—or one-time Platonists—the climax may have come later. For they will want to see not just an exposition of views alternative to their own, but a reason why they should abandon views they already hold in favor of these. It is not until M 10, moreover, that we encounter a resolution to a puzzle characterized as being among the very greatest ($1087^{a}13$). This is the puzzle (P12), introduced in B 6 $1003^{a}5$–17, restated in K 1 ($1060^{b}19$–23), and discussed in Z 13 and 15, of how the starting-points of science can be universal when the primary substances (the starting-points of the science of being qua being) are particulars. When we see what it takes to solve it, we see that it merits its characterization.

None of this entails, to be sure, that the *Metaphysics* does not in the most important sense hang together philosophically, or that its central argument cannot be reconstructed. Far from it. A patient and persistent reader will find, I think, that there is more not less coherence than might seem to be the case in the light of what has just been said about the state of the text as we have it.

What Metaphysics Is

The word "metaphysics" is a near transliteration of the Greek phrase *ta meta ta phusika*, which means "the things or writings that are after *ta phusika*"—after the ones devoted to natural things. It is not Aristotle's term for anything, not even for the work—or the contents of the work—that

now has it as its title. But because that title mentions *ta phusika*, Aristotle's *Physics* is where we might reasonably begin our search for what comes after it.

In the *Physics* (some relevant bits of which are quoted or summarized, as we saw, in the second half of Kappa), Aristotle's focus is on the world of nature (*phusis*), a world pretty much coincident with the sublunary realm, consisting canonically of matter-form compounds, whose material component involves the sublunary elements—earth, water, air, and fire. Were these the only substances, the only primary beings, we learn in E 1, the science of them would be the science that the *Metaphysics* wishes to investigate, which is referred to as theoretical wisdom, the science of being qua being, and the primary science or primary philosophy. But if there are other substances, which are not composed of the sublunary elements, "that are eternal and immovable and separable," and so prior to natural ones, the science of them will be the science of being qua being ($1026^{a}10$–16).

That there must be such substances is argued already in *Physics* VIII, and that the gods, including in particular *the* (primary) god, are among them is presupposed from quite early on also in the *Metaphysics*. Thus in A 2 we hear that theoretical wisdom is the science of this god, both in having him as its subject matter and in being the science that is in some sense his science. When it is argued in Λ 9 that he must be "the active understanding [that] is active understanding of active understanding" ($1074^{b}34$–35), we see how much *his* it is, since actively understanding itself—contemplating itself in an exercise of theoretical wisdom—is just what Aristotle's god *is*. While this is no doubt difficult to understand, Aristotle's argument for it is so probing and resourceful that we can come to understand it—or at any rate see why he thought it the only available option.

With just this much on the table there is already a puzzle whose difficulty is increased by special doctrine. Aristotle usually divides the bodies of knowledge he refers to as *epistêmai* ("sciences") into three types: theoretical, practical, and productive (crafts). When he is being especially careful, he also distinguishes within the theoretical sciences between the strictly theoretical ones (astronomy, theology), as we may call them, and the natural ones, which are like the strictly theoretical ones in being neither practical nor productive but unlike them in consisting of propositions that—though necessary and universal in some sense—hold for the most part rather than without exception (E 1 $1025^{b}25$–$1026^{a}30$). Psychology, as a result, has an interestingly mixed status, part strictly theoretical (because it deals with understanding, which is something divine), part natural (because it deals with perception and memory and other capacities that require a body) (*DA* I 1 $403^{a}3$–$^{b}16$, quoted in E 1 $1026^{a}6$n).

When science receives its focused discussion in the *Nicomachean Ethics,* however, Aristotle is explicit that if we are "to speak in an exact way and not be guided by mere similarities" (VI 3 1139^{b}19), we should not call anything a science unless it deals with eternal, entirely exceptionless facts about universals that are wholly necessary and do not at all admit of being otherwise (1139^{b}20–21). Since he is here explicitly epitomizing his more detailed discussion of science in the *Posterior Analytics* (1139^{b}27), we should take the latter too as primarily a discussion of science in the exact sense, which it calls *epistêmê haplôs*—unconditional scientific knowledge. It follows that only the strictly theoretical sciences are sciences in this sense. It is on these that the others should be modeled to the extent that they can be: "it is the things that are always in the same state and never undergo change that we must make our basis when pursuing the truth, and this is the sort of thing that the heavenly bodies are" (K 6 1063^{a}13–15).

Having made the acknowledgement, though, we must also register the fact that Aristotle himself mostly does not speak in the exact way but instead persistently refers to bodies of knowledge other than the strictly theoretical sciences as *epistêmai*. His division of the *epistêmai* into theoretical, practical, and productive is a dramatic case in point. But so too is his use of the term *epistêmê,* which we first encounter in the *Metaphysics* as a near synonym of *technê*, or craft knowledge, which is productive not theoretical (A 1 981^{a}3).

An Aristotelian science, although a state of the soul rather than a set of propositions in a textbook, nonetheless does involve having an assertoric grasp on a set of true propositions (*NE* VI 3 1139^{b}14–16). Some of these propositions are indemonstrable starting-points (*archai*), which are or are expressed in definitions, and others are theorems demonstrable from these starting-points. We can have scientific knowledge only of the theorems, since—exactly speaking—only what is demonstrable can be scientifically known (VI 6). Yet—in what is clearly another lapse from exact speaking—Aristotle characterizes "the most rigorous of the sciences," which is theoretical wisdom (*sophia*), as also involving a grasp by understanding (*nous*) on the truth where the starting-points themselves are concerned (VI 7 1141^{a}16–18). He does the same thing in the *Metaphysics,* where theoretical wisdom is the *epistêmê* that provides "a theoretical grasp on the primary starting-points and causes"—among which are included "the good or the for-sake-of-which" (I 2 982^{b}7–10). It is for this reason that the primary god's grasp on himself through understanding is an exercise of scientific knowledge.

Now each of these sciences, regardless of what group it falls into, must—for reasons having to do with the nature of definition and demonstration—be restricted in scope to a single genus of beings (A 1 981^{a} 3n(5)). Since

being is not itself a genus (*APo*. II 7 92^{b}14), as Aristotle goes out of his way not just to acknowledge but to prove (Γ 2), it apparently follows that there should be no such science as the science of being qua being—as theoretical wisdom. To show that there is one thus takes some work.

It is a cliché of the history of philosophy that Aristotle is an empiricist and Plato a rationalist, and like all clichés there is some truth in it. In fact, Aristotle is not just an empiricist at the level of the sciences we call empirical, he is an empiricist at all levels. To see what I mean, think of each of the special, genus-specific sciences—the *first-order* sciences—as giving us a picture of a piece of the world, a region of being. Then ask, what is the world like that these sciences collectively portray? What is the nature of reality as a whole—of being as a whole? If there is no answer besides the collection of special answers, the world is, as Aristotle puts it, episodic—like a bad tragedy (Λ 10 1076^{a}1, N 3 1090^{b}20). But if there is an answer, it should emerge from a meta-level empirical investigation of the special sciences themselves. As each of these looks for universals (natural kinds) that stand in demonstrative causal relations to each other, so this meta-level investigation looks for higher-level universals that reveal the presence of common structures of explanation in diverse sciences:

> The causes and starting-points of distinct things are distinct in a way, but in a way—if we are to speak universally and analogically—they are the same for all. . . . For example, the elements of perceptible bodies are presumably: as *form*, the hot and, in another way, the cold, which is the *lack*; and, as *matter*, what is potentially these directly and intrinsically. And both these and the things composed of them are substances, of which these are the starting-points (that is, anything that comes to be from the hot and the cold that is one [something-or-other], such as flesh or bone), since what comes to be from these must be distinct from them. These things, then, have the same elements and starting-points (although distinct things have distinct ones). But that all things have the same ones is not something we can say just like that, although *by analogy* they do. That is, we might say that there are three starting-points—the form, the lack, and the matter. But each of these is distinct for each category (*genos*)—for example, in colors they are white, black, and surface, or light, darkness, and air, out of which day and night come to be. (Λ 4 1070^{a}31–^{b}21)

The genus-specific sciences show the presence in the world of a variety of *different* explanatory structures. The trans-generic sciences, by finding

commonalities between these structures, show the equally robust presence there of the *same* explanatory structure: form, lack of form, matter.

The science to which form, lack, and matter belong is, in the first instance, trans-generic natural science. It is the one that would be the primary science, were there no eternal immovable substances separable from the natural ones. But there is also a trans-generic—or universal—mathematical science (E 1 $1026^{a}13$–23). And the introduction of intelligible matter (Z 10 $1036^{a}11$–12), as the matter of abstract mathematical objects, allows us to see a commonality in explanatory structure between the mathematical sciences and the natural ones. Between these two trans-generic sciences and the theological one (E 1 $1026^{a}19$), on the other hand, the point of commonality lies not in matter, since the objects of theological science have no matter (Λ 6 $1071^{b}20$–21), but rather in form. For what the objects of theology, divine substances (which includes human understanding or *nous*), have in common with those of mathematics and natural science is that they are forms, though—and this is the crucial point of difference—not forms in any sort of matter whatsoever. That form should be a focal topic of investigation for the science of being qua being is thus the result of an inductive or empirical investigation of the various genus-specific sciences, and then of the various trans-generic ones, which shows form to be the explanatory feature common to all their objects—to all beings.

It is this empirical fact that provides the science of being qua being with a genuine trans-generic object of study, thereby legitimating it as every bit as much a science as any generic-specific one. The science of being qua being is accordingly a science of form. The question now is how can that science at the same time be theology, the science of divine substance? And to it Aristotle gives a succinct answer:

> We might raise a puzzle indeed as to whether the primary philosophy is universal or concerned with a particular genus and one particular nature. For it is not the same way even in the mathematical sciences but rather geometry and astronomy are concerned with a particular nature, whereas universal mathematics is common to all. If, then, there is no other substance beyond those composed by nature, natural science will be the primary science. But if there is some immovable substance, this [that is, theological philosophy] will be prior and will be primary philosophy, and it will be universal in this way, namely, because it is primary. And it will belong to it to get a theoretical grasp on being qua being, both what it is and the things that belong to it qua being. (E 1 $1026^{a}23$–32)

So the primacy of theology, which is based on the fact that theology deals with substance that is eternal, immovable, and separable, is supposedly what justifies us in treating it as the universal science of being qua being.

To get a handle on what this primacy is, we need to turn to being and its structure. The first thing to grasp is that beings are divided into categories: substance, quality, quantity, relation, and so on (A 1 981^{a}3n(7), 3 983^{a}27–28n). But of these, only beings in the category of substance are separable, so that they alone enjoy a sort of ontological priority that is both existential and explanatory (Z 1 1028^{a}31–^{b}2). Other beings are attributes of different sorts, which exist only by belonging to some substance. So if we want to explain what a quality is, for example, we have to say what sort of attribute it is (Δ 14) and ultimately what in a substance is receptive of it. It is this fact that gives one sort of unity to beings: they are all either substances or attributes of substances. Hence the famous claim which ends Z 1:

> Indeed, the question that was asked long ago, is now, and always will be asked, and is always raising puzzles—namely, What is being?—is just the question, What is substance? . . . And that is why we too must most of all, primarily, and (one might almost say) exclusively get a theoretical grasp on what it is that is a being in this [substantial] way. (1028^{b}2–7)

The starting-points and causes of beings qua beings must, then, be substances. Thus while something is said to be in as many ways as there are categories, they are all so said "with reference to one thing and one nature" (Γ 2 1003^{a}33–34)—substance. It could still be the case, of course, that the cosmos is episodic like a bad tragedy, made up of lots of separate substances having little ontologically to do with one another, but the number of episodes has at least been systematically reduced.

Before turning to the next phase in being's unification, we need to look more closely at substance itself as it gets investigated and analyzed in Zeta, and then in Eta and Theta. The analysis begins with a *legomenon*—with something said and accepted quite widely.

> Something is said to be (*legetai*) substance, if not in more ways, at any rate most of all in four. For the essence, the universal, and the genus seem to be the substance of each thing, and fourth of these, the underlying subject. (Z 3 1028^{b}33–36)

Since "the primary underlying subject seems most of all to be substance" (1029^{a}1–2), because what is said or predicated of it depends on it, the

investigation begins with this subject, quickly isolating three candidates: the matter, the compound of matter and form, and the form itself (1029^{a}2–3), which is identical to the essence (Z 7 1032^{b}1–2). Almost as quickly (Z 3 1029^{a}7–32), the first two candidates are at least provisionally excluded, leaving form alone as the most promising candidate for being substance. But form is "most puzzling" (1029^{a}33) and requires extraordinary ingenuity and resources to explore.

Aristotle begins the investigation into it with the most familiar and widely recognized case, which is the form or essence present in sublunary matter-form compounds. This investigation is announced in Z 3 1029^{b}3–12, but not begun till some chapters later (Z 7 headnote) and not really completed till the end of Θ 5. By then the various other candidates for being substance have been eliminated or reconceived, and actuality and potentiality have come to prominence. Hence in Θ 6 it is with actuality or activity—*entelecheia* or *energeia* (H 2 1042^{b}10n)—that form, and so substance, is identified, and matter with potentiality.

Precisely because actuality and potentiality are the ultimate explanatory factors, however, they themselves cannot be given an explanatory definition in yet more basic terms. Instead we must grasp them by means of an analogy:

> What we wish to say is clear from the particular cases by induction, and we must not look for a definition of everything, but be able to comprehend the analogy, namely, that as what is building is in relation to what is capable of building, and what is awake is in relation to what is asleep, and what is seeing is in relation to what has its eyes closed but has sight, and what has been shaped out of the matter is in relation to the matter, and what has been finished off is to the unfinished. Of the difference exemplified in this analogy let the activity be marked off by the first part, the potentiality by the second. (Θ 6 1048^{a}35–^{b}6)

What is common, then, to matter-form compounds, mathematical objects, and divine substances is actuality. In the case of matter-form compounds and numbers the actuality is accompanied by potentiality—perceptual sublunary matter in the first case, intelligible matter in the second. In the case of divine substances and other such unmoved movers, it is not. They are "pure" activities or actualities, wholly actual at each moment. Matter-form compounds, by contrast, are never wholly actual—they are always in some way potential. You are actively reading this now, not actively swimming, but you could be swimming, since you have the presently un-activated capacity (or potentiality) to swim.

The science of being qua being can legitimately focus on form, or actuality, as the factor common to divine substances, matter-form compounds, and mathematical objects. But unless it can be shown that there is some explanatory connection between the forms in these different beings the non-episodic nature of being itself will still not have been established, and the pictures given to us by the natural, mathematical, and theological sciences will, so to speak, be separate pictures, and the being they collectively portray will be divided.

The next stage in the unification of being and the legitimation of the science dealing with it qua being is effected by an argument that trades, unsurprisingly, on the identification of form and matter with actuality and potentiality. Part of the argument is given in Θ 8–9, where the various sorts of priority requisite in a substance are argued to belong to actuality rather than potentiality. But it is in Λ 6 that the pertinent consequences are most decisively drawn:

> If there is something that is capable of moving things or acting on them, but that is not actively doing so, there will not [necessarily] be movement, since it is possible for what has a capacity not to activate it. There is no benefit, therefore, in positing eternal substances, as those who accept the Forms do, unless there is to be present in them some starting-point that is capable of causing change. Moreover, even this is not enough, and neither is another substance beyond the Forms. For if it will not be active, there will not be movement. Further, even if it will be active, it is not enough, if the substance of it is a capacity. For then there will not be *eternal* movement, since what is potentially may possibly not be. There must, therefore, be such a starting-point, the very substance of which is activity. Further, accordingly, these substances must be without matter. For they must be eternal, if indeed *anything* else is eternal. Therefore they must be activity. (1071^{b}12–22)

Matter-form compounds are, as such, capable of movement and change. The canonical examples of them—perhaps the only genuine or fully fledged ones—are living metabolizing beings (Z 17 1041^{b}29–30). But if these beings are to be actual, there must be substances whose very essence is activity—substances that do not need to be activated by something else.

With matter-form compounds shown to be dependent on substantial activities for their actual being, a further element of vertical unification is introduced into beings, since layer-wise the two sorts of substances belong together. Laterally, though, disunity continues to threaten. For as

yet nothing has been done to exclude the possibility that each compound substance has a distinct substantial activity as its own unique activator. Being, in that case, would be a set of ordered pairs, the first member of which was a substantial activity, the second a matter-form compound, with all its dependent attributes.

In Λ 8 Aristotle initially takes a step in the direction of such a bipartite picture. He asks how many substantial activities are required to explain astronomical phenomena, such as the movements of the stars and planets, and answers that there must be forty-nine of them (1074^{a}16n). But these forty-nine are visibly coordinated with each other so as to form a system. And what enables them to do so, and constitute a single heaven, is that there is a single prime mover of all of them:

> It is evident that there is but one heaven. For if there are many, as there are many humans, the starting-point for each will be one in form but in number many. But all things that are many in number have matter, for one and the same account applies to many, for example, humans, whereas Socrates is one. But the primary essence does not have matter, since it is an actuality. The primary immovable mover, therefore, is one both in account and in number. And so, therefore, is what is moved always and continuously. Therefore, there is only one heaven. (1074^{a}31–38)

The argument is puzzling, to be sure, since the immateriality that ensures the uniqueness of the prime mover would seem to threaten the multiplicity of the forty-nine movers, since they are also immaterial (discussed in 1074^{a}31n); nonetheless the point of it is clear enough: what accounts for the unity of the heaven is that the movements in it are traceable back to a single cause—the prime mover.

It is tempting to follow in Aristotle's footsteps at this point and discuss the nature of the prime mover—how he moves the primary heaven in the way, familiar from Dante, that an unmoved object of love or desire moves an animate being, so that the primary heaven and the others as well must all be animate beings in order to be so moved, and why it is that he must be a cosmic understanding that has that understanding itself as its sole object. But it is better for present purposes to stick to our topic and look at the next phase in the unification of beings, in which the sublunary world is integrated with the already unified superlunary one studied by astronomy.

This takes place in Λ 10, although elements of it have emerged earlier. One obvious indication of this unification is the dependence of the reproductive cycles of plants and animals on the seasons, and their dependence, in turn, on the movements of the sun and moon:

> The cause of a human is both his elements, fire and earth as matter and the special form [as form], and furthermore some other external thing, such as the father, and beyond these the sun and its movement in an inclined circle. (1071ª13–16)

And beyond even that there is the unity of the natural world itself, which is manifested in the ways in which its inhabitants are adapted to each other:

> All things are jointly ordered in a way, although not in the same way—even swimming creatures, flying creatures, and plants. And the order is not such that one thing has no relation to another but rather there is a relation. For all things are jointly ordered in relation to one thing—but it is as in a household, where the free people least of all do things at random, but all or most of the things they do are ordered, while the slaves and beasts can do a little for the common thing, but mostly do things at random. For this is the sort of starting-point that the nature is of each of them. I mean, for example, that all must at least come to be disaggregated [into their elements]; and similarly there are other things which they all share for [the good of] the whole. (Λ 10 1075ª16–25)

Just how much unity all this results in—just what it means to speak of "the nature of the whole" (1075ª11) or of the universe as having "one ruler" (1076ª4)—is a matter of dispute. The fact remains, though, that the sublunary realm is sufficiently integrated with the superlunary one that we can speak of them as jointly having a nature and a ruler and as being analogous not to Heraclitus' "heap of random sweepings," but to an army (1075ª13) and a household (1075ª22n).

We may agree, then, that the divine substances in the superlunary realm and the compound substances in the sublunary one have prima facie been vertically integrated into a single explanatory system. When we look at the form of a sublunary matter-form compound, then, we will find in it the mark of a superlunary activator, just as we do in the case of the various heavenly bodies, and, as in the line of its efficient causes, we find "the sun and its movement in an inclined circle" (Λ 7 1071ª15–16). Still awaiting integration, though, are the mathematical objects, and their next of kin, Platonic Forms.

That there is mathematical structure present in the universe can seem to be especially clear in the case of the superlunary realm, just as mathematics itself, with its rigorous proofs and necessary and certain truths, can seem the very paradigm of scientific knowledge. So it is hardly surprising that some of Aristotle's predecessors, especially Pythagoreans and Platonists,

thought that the primary causes and starting-points of beings are to be found in the part of reality that is mathematics friendly, or in some way mathematizable. For example, some Platonists (Plato among them, in Aristotle's much disputed view) held that for each kind of sublunary (or perceptible) thing there was an eternal intelligible Form or Idea to which it owed its being, and which owed its own being, in turn, to "the one," as its substance, and the so-called indefinite dyad of the great and the small, as its matter. So when we ask what makes a man a man, the answer will be, because it participates in the Form or Idea of a man, which owes its being to the way it is constructed or generated from the indefinite dyad and the one. And because the Forms are so constructed, Aristotle says (anyway on one reading of the text) that "the Forms are the numbers" (A 6 $987^{b}20$–22). Between these so-called Form (or Ideal) numbers, in addition, are the numbers that are the objects of mathematics: the intermediates. This elaborate system of, as I put it, mathematics-friendly objects, then, are the substances—the ultimate starting-points and causes of beings qua beings.

Against these objects and the ontological role assigned to them, Aristotle launches a host of arguments (thirty-two or so in A 9, twenty-four in M 8–9, and many others elsewhere), proposing in their place an entirely different account of mathematical objects, which treats them not as substantial starting-points and causes but as abstractions from perceptible sublunary beings—dependent entities, in other words, rather that self-subsistent or intrinsic ones (M 2–3). This completes the vertical and horizontal unification of being: attributes depend on substances, substantial matter-form compounds depend on substantial forms, or activities, numbers depend on substances.

Beings are not said to be "in accord with one thing," then, as they would be if they formed a single genus, but "with reference to one thing"—namely, a divine substance that is in essence an activity. And it is this more complex unity, compatible with generic diversity, and a genuine multiplicity of distinct genus-specific sciences, but just as robust and well grounded as the simpler genus-based sort of unity, that grounds and legitimates the science of being qua being as a single science dealing with a genuine object of study (Γ 2 1003^{b}11–16). The long argument that leads to this conclusion is thus a sort of existence proof of the science on which the *Metaphysics* focuses.

It is the priority of a divine substance with that science as its science that justifies each of the following descriptions of what the *Metaphysics* is about:

> If, then, there is no other substance beyond those composed by nature, natural science will be the primary science. But if there is some immovable substance, this [that is, theological philosophy] will be prior and will be primary philosophy, and it will be universal in this way, namely, because it is primary. And it

> will belong to it to get a theoretical grasp on being qua being, both what it is and the things that belong to it qua being. (E 1 1026[a]27–32)
>
> Whether there is, beyond the matter of these sorts of substances, another sort of matter, and whether to look for another sort of substance, such as numbers or something of this sort, must be investigated later. For it is for the sake of this that we are trying to make some determinations about the perceptible substances, since in a certain way it is the function of natural science and secondary philosophy to have theoretical knowledge about the perceptible substances. (Z 11 1037[a]10–16)
>
> Since we have spoken about the capacity [or potentiality] that is said [of things] with reference to movement, let us make some distinctions concerning activity, both concerning what it is and what sort of thing it is. For the capable too will at the same time become clear as we make our determinations, because we do not say only of that which naturally moves something else, or is moved by something else, that it is capable, whether unconditionally or in a certain way, but also use the term in a different way, which is why in the course of our inquiry we went through the former. (Θ 6 1048[a]25–30)
>
> Concerning the primary starting-points and the primary causes and elements, however, some of what is said by those who speak only about perceptible substance has been discussed in our works on nature, while some does not belong to the present methodical inquiry. But what is said by those who assert that there are other substances beyond the perceptible ones is something we need to get a theoretical grasp on next after what we have just discussed. (M 9 1086[a]21–26)

The science of being qua being is a sort of theology, as A 2 already told us it was, but it is a sort of theology only because of the special role of the primary god among beings.

Is the Investigation in the Metaphysics *a Scientific One?*

If we think of a science in the exact sense as consisting exclusively of what is demonstrable, as we saw Aristotle himself sometimes does, we will be

right to conclude that a treatise without demonstrations in it cannot be scientific. But if, as he also does, we include knowledge of starting-points as parts of science, we will not be right, since a treatise could contribute to a science not by demonstrating anything but by arguing to the starting-points themselves—an enterprise which couldn't without circularity consist of demonstrations *from* those starting-points. Arguments leading from starting-points and arguments leading to starting-points are different, we are invited not to forget (*NE* I 4 $1095^{a}30$–32), just as we are told that because establishing starting-points is "more than half the whole" (I 7 $1098^{b}7$), we should "make very serious efforts to define them correctly" ($1098^{b}5$–6). We might reasonably infer, therefore, that the *Metaphysics* is a contribution to the *science of being qua being* precisely because it contributes to the correct definition and secure grasp on starting-points without which no science can exist.

In our investigation of starting-points, "we must," Aristotle says, "start from things known *to us*" (*NE* I 4 $1095^{b}3$–4). For the sake of clarity, let us call these *raw starting-points*. These are the ones we start from when we are arguing to *explanatory scientific starting-points*. It is important not to confuse the two—especially when, as in the *Metaphysics*, the raw starting-points are in part the result of the sort of meta-level induction carried out on the various special sciences we looked at earlier and in part the result of a critical investigation of the views of other philosophers on the nature of the starting-points of such sciences (as in, for example, A 3–10).

In the case of the special sciences the explanatory starting-points include, in particular, definitions that specify the genus and differentiae of the real (as opposed to nominal) universal essences of the beings with which the science deals (*APo*. II 10 $93^{b}29$–$94^{a}19$). Since scientific definitions must be apt starting-points of demonstrations, this implies, Aristotle thinks, that the "extremes and the middle terms must come from the same genus" (I 7 $75^{b}10$–11). As a result a single canonical science must deal with a single genus (I 28 $87^{a}38$–39). To reach these definitions from raw starting-points, we first have to have the raw starting-points ready to hand. Aristotle is clear about this, as he is indeed about what is supposed to happen next:

> The method (*hodos*) is the same in all cases, in philosophy as well as in the crafts or any sort of learning whatsoever. For one must observe for both terms what belongs to them and what they belong to, and be supplied with as many of these terms as possible, and one must investigate them by means of the three terms [in a syllogism], in one way when refuting, in another way when establishing something. When it is in accord with truth, it must be from the terms that are catalogued (*diagegramenôn*)

> as truly belonging, but in dialectical deductions it must be from premises that are in accord with [reputable] belief. . . . Most of the starting-points, however, are special to each science. That is why experience must provide us with the starting-points where each is concerned—I mean, for example, that experience in astronomy must do so in the case of astronomical science. For when the appearances had been adequately grasped, the demonstrations in astronomy were found in the way we described. And it is the same way where any other craft or science whatsoever is concerned. Hence if what belongs to each thing has been grasped, at that point we can readily exhibit the demonstrations. For if nothing that truly belongs to the relevant things has been omitted from the collection, then concerning everything, if a demonstration of it exists we will be able to find it and give the demonstration, and if it is by nature indemonstrable, we will be able to make that evident. (*APr.* I 30 $46^{a}3$–27)

Once we have a catalogue of the *raw starting-points*, then, the demonstrative explanation of them from explanatory scientific starting-points is supposedly fairly routine. We should not, however, demand "the cause [or explanation] in all cases alike. Rather, in some it will be adequate if the fact that they are so has been correctly shown (*deiknunai*) as it is indeed where starting-points are concerned" (*NE* I 8 $1098^{a}33$–$^{b}2$). But what exactly is it to show a starting-point correctly or adequately?

Aristotle describes the science of being qua being as a branch (ultimately the theological one) of theoretical philosophy (E 1 $1026^{a}18$–19, 30–32) or theoretical science (K 7 $1064^{b}1$–3), and to the explanatory scientific starting-points of philosophical sciences, he claims, there is a unique route:

> Dialectic is useful in the philosophical sciences because the capacity to go through the puzzles on both sides of a question will make it easier to discern what is true and what is false in each. Furthermore, dialectic is useful in relation to the primary [starting-points] (*ta prota*) in each science. For it is impossible to say anything about these based on the starting-points properly belonging to the science in question, since these starting-points are, of all of them, the primary ones, and it is through reputable beliefs (*endoxa*) about each that it is necessary to discuss them. This, though, is a task special to, or most characteristic of, dialectic. For because of its ability to examine (*exetastikê*), it has a route toward the starting-points of all methodical inquiries. (*Top.* I 2 $101^{a}34$–$^{b}4$)

Prima facie, then, the *Metaphysics* should correctly show the explanatory starting-points of the science of being qua being by going through puzzles and solving these by appeal to reputable beliefs. But before we rush to the *Metaphysics* to see whether that is what we do find, we need to be clearer about what exactly we should be looking for.

Dialectic is recognizably a descendant of the Socratic elenchus, which famously begins with a question like this: *Ti esti to kalon?* What is the noble? The respondent, sometimes after a bit of nudging, comes up with a universal definition, what is noble is what all the gods love, or whatever it might be (I adapt a well-known answer from Plato's *Euthyphro*). Socrates then puts this definition to the test by drawing attention to some things that seem true to the respondent himself but which conflict with his definition. The puzzle or *aporia* that results from this conflict then remains for the respondent to try to solve, usually by reformulating or rejecting his definition. Aristotle understood this process in terms that show its relationship to his own:

> Socrates, on the other hand, busied himself about the virtues of character, and in connection with them was the first to inquire about universal definition. . . . It was reasonable, though, that Socrates was inquiring into the what-it-is. For he was inquiring in order to deduce, and the what-it-is is a starting-point of deductions. For at that time there was not yet the strength in dialectic that enables people, and separately from the what-it-is, to investigate contraries, and whether the same science is a science of contraries. For there are two things that may be fairly ascribed to Socrates—inductive arguments and universal definition, both of which are concerned with a starting-point of scientific knowledge. (M 4 $1078^{b}17$–30; also A 6 $987^{b}1$–4)

In Plato too dialectic is primarily concerned with scientific starting-points, such as those of mathematics, and seems to consist in some sort of elenchus-like process of reformulating definitions in the face of conflicting evidence so as to render them puzzle-free (*Rep.* VII 532a1–533d1). Aristotle can reasonably be seen, then, as continuing a line of thought about dialectic, while contributing greatly to its exploration, systemization, and elaboration in works such as *Topics* and *Sophistical Refutations*.

Consider now the respondent's first answer, his first definition: what is noble is what the gods love. Although it is soon shown to be incorrect, there is something quite remarkable about its very existence. Through experience shaped by acculturation and habituation involving the learning of a natural language the respondent is confident that he can say what

nobility is. He has learned to apply the word "noble" to particular people, actions, and so on correctly enough to pass muster as knowing its meaning, knowing how to use it. From these particular cases he has reached a putative universal, something the particular cases have in common. But when he tries to define that universal in words, he gets it wrong, as Socrates shows. Here is Aristotle registering the significance of this: "The things that are knowable and primary for particular groups of people are often only slightly knowable and have little or nothing of the being in them. Nonetheless, beginning from things that are poorly known but known to ourselves, we must try to know the ones that are wholly knowable, proceeding, as has just been said, through the former" (Z 3 $1029^{b}8$–12).

The route by which the respondent reaches the universal that he is unable to define correctly is what Aristotle calls induction (*epagôgê*). This begins with (1) perception of particulars, which leads to (2) retention of perceptual contents in memory, and, when many such contents have been retained, to (3) an experience, so that for the first time "there is a universal in the soul" (*APo.* II 19 $100^{a}3$–16). The universal reached at stage (3), which is the one the respondent reaches, is described as "indefinite" and "better known by perception" (*Ph.* I 1 $184^{a}22$–25). It is the sort of universal, often quite complex, that constitutes a nominal essence corresponding to the nominal definition or meaning of a general term. Finally, (4) from experience come craft knowledge and scientific knowledge, when "from many intelligible objects belonging to experience, one universal supposition about similar things comes about" (A 1 $981^{a}5$–7).

The nominal (or analytic, meaning-based) definition of the general term "thunder," for example, might pick out the universal *loud noise in the clouds*. When science investigates the things that have this nominal essence, it may find that they also have a real essence or nature in terms of which their other features can be scientifically explained:

> Since a definition is said to be an account of what something is, it is evident that one sort will be an account of what its name, or some other name-like account, signifies—for example, what triangle signifies. . . . Another sort of definition is an account that makes clear why it exists. So the former sort signifies something but does not show it, whereas the latter will evidently be like a demonstration of what it is, differing in arrangement from a demonstration. For there is a difference between saying why it thunders and saying what thunder is. In the first case you will say: because fire is being extinguished in the clouds. And what is thunder? The loud noise of fire being extinguished in the clouds. Hence the same account is given in different

> ways. In one way it is a continuous demonstration, in the other a definition. Further, a definition of thunder is a noise in the clouds, and this is a conclusion of the demonstration of what it is. The definition of an immediate item, though, is an indemonstrable positing (*thesis*) of what it is. (*APo*. II 10 $93^{b}29$–$94^{a}10$; compare *DA* II 2 $413^{a}13$–20, *Z* 17)

A real (or synthetic, fact-based) definition that analyzes this real essence into its "elements and starting-points" (*Ph*. I 1 $184^{a}23$), which will be definable but indemonstrable within the science, makes intrinsically clear what the nominal definition made clear only to us by enabling us to recognize instances of thunder in a fairly—but imperfectly—reliable way. As a result, thunder itself, now clearly a natural and not just a conventional kind, becomes better known not just to us but entirely or unconditionally. These analyzed universals, which are the sort reached at stage (4), are the ones suited to serve as starting-points of the sciences and crafts: "experienced people know the that but do not know the why, whereas craftsmen know the why, that is, the cause" (A 1 $981^{a}28$–30).

Socrates too, we see, wanted definitions that were not just empirically adequate but also explanatory: in telling Euthyphro what he wants in the case of piety, he says that he is seeking "the Form itself *in virtue of which* all the pieties are pieties" (*Euthphr*. 6d10–11). That is why he rejects the definition of piety as being what all the gods love. This definition is in one way correct, presumably, in that if something is pious it is necessarily loved by the gods and vice versa, but it isn't explanatory, since it doesn't tell us what it is about pious things that makes all the gods love them, and so does not identify the form in virtue of which they are pious (9e–11b).

Let us go back. We wanted to know what was involved in showing a scientific starting-point. We were told how we could *not* do this, namely, by demonstrating it from scientific starting-points. Next we learned that dialectic had a route to it from reputable beliefs. At the same time, we were told that induction had a route to it as well—something the *Nicomachean Ethics* also tells us: "we get a theoretical grasp on some starting-points through induction, some through perception, some through some sort of habituation, and others through other means" (I 7 $1098^{b}3$–4). This suggests that induction and dialectic are in some way or other the same process.

What shows a Socratic respondent to be wrong is an example that his definition does not fit. The presentation of the example might be quite indirect, however. It might take quite a bit of stage setting, elicited by the asking of many questions, to bring out a puzzle. But if it does succeed in doing so, it shows that the universal grasped by the respondent and the definition of

it produced by him are not entirely or unconditionally knowable and that his state is not one of clear-eyed understanding:

> A puzzle in thought makes manifest a knot in the subject matter. For insofar as thought is puzzled it is like people who are tied up, since in both cases it is impossible to move forward. That is why we must get a theoretical grasp on all the difficulties beforehand, both for these reasons and because those who inquire without first going through the puzzles are like people who do not know where they have to go. And, in addition, a person [who has not already grasped the puzzles] does not even know whether he has found what he is inquiring into. For to someone like that the end is not clear, whereas to a person who has already grasped the puzzles it is clear. (α 1 $995^{a}30–^{b}2$)

But lack of such clear-eyed understanding of a scientific starting-point has serious downstream consequences:

> If we are to have scientific knowledge through demonstration, . . . we must know the starting-points better and be better convinced of them than of what is being shown, but we must also not find anything more convincing or better known among things opposed to the starting-points from which a contrary mistaken conclusion may be deduced, since someone who has unconditional scientific knowledge must be incapable of being convinced out of it. (*APo*. I 2 $72^{a}37–^{b}4$)

If dialectical examination brings to light a puzzle in a respondent's thought about a scientific starting-point, then he cannot have any unconditional scientific knowledge even of what he may well be able to demonstrate correctly from it. Contrariwise, if dialectical examination brings to light no such puzzle, he apparently does have clear-eyed understanding, and his route to what he can demonstrate is free of obstacles.

At the heart of dialectic, as Aristotle understands it, is the dialectical deduction (*dialektikos sullogismos*). This is the argument lying behind the questioner's questions, partly dictating their order and content and partly determining the strategy of his examination. In the following passage it is defined and contrasted with two relevant others:

> Dialectical arguments are those that deduce from reputable beliefs in a way that reaches a contradiction; peirastic arguments are those that deduce from those beliefs of the respondent that

> anyone must know (*eidenai*) who pretends to possess scientific knowledge . . .; contentious (*eristikos*) arguments are those that deduce or appear to deduce from what appear to be reputable beliefs but are not really such. (*SE* 2 $165^{b}3$–8)

If we think of dialectical deductions in this way, a dialectician, in contrast to a contender, is an honest questioner, appealing to genuinely reputable beliefs and employing valid deductions. "Contenders and sophists use the same arguments," Aristotle says, "but not to achieve the same goal. . . . If the goal is apparent victory, the argument is contentious; if it is apparent wisdom, sophistic" (11 $171^{b}27$–29). Nonetheless, he does also use the term *dialektikê* as the name for the craft that honest dialecticians and sophists both use: "In dialectic a sophist is so called in virtue of his deliberate choice, and a dialectician is so called not in virtue of his deliberate choice, but in virtue of the capacity he has" (*Rh.* I 1 $1355^{b}20$–21). If dialectic is understood in this way, a dialectician who deliberately chooses to employ contentious arguments is a sophist (I 1 $1355^{a}24$–$^{b}7$). We need to be careful, therefore, to distinguish *honest dialectic* from what we may call *plain dialectic*, which—like all crafts—can be used for good or ill (*NE* V 1 $1129^{a}13$–17).

The canonical occasion for the practice of the Socratic elenchus, obviously, is the examination of someone else. But there is nothing to prevent a person from practicing it on himself: "How could you think," Socrates ask Critias, "that I would refute you for any reason other than the one for which I would refute myself, fearing lest I might inadvertently think I know something when I don't know it?" (*Chrm.* 166c7–d2). Dialectic is no different in this regard:

> The premises of the philosopher's deductions, or those of a person who is investigating by himself, though true and knowable, may be refused by the respondent because they lie too near to the original proposition, and so he sees what will happen if he grants them. But the philosopher is unconcerned about this. Indeed, he will presumably be eager that his axioms should be as familiar and as near to the question at hand as possible, since it is from premises of this sort that scientific deductions proceed. (*Top.* VIII 1 $155^{b}10$–16)

What we are to imagine, then, is that the philosopher surveys the raw scientific starting-points, constructing detailed catalogues of these. He then tries to formulate definitions of the various universals involved in them that seem to be candidate scientific starting-points, testing these against the raw scientific starting-points by trying to construct demonstrations

from them. But these definitions will often be no more than partial: the philosopher is only on his way to complete definitional starting-points, just as the demonstrations will often be no more than proto- or nascent demonstrations. The often rudimentary demonstrations that we find in Aristotle's scientific treatises are surely parts of this process of arguing *to* not *from* starting-points. We argue to these in part by seeing whether or to what extent we could demonstrate from them.

So: First, we have the important distinction between dialectic proper, which includes the use of what appear to be deductions from what appear to be reputable beliefs, and honest dialectic, which uses only genuine deductions from genuine reputable beliefs. Second, we have the equally important distinction between the use of dialectic in examining a potentially hostile respondent and its use by the philosopher in a perhaps private pursuit of the truth. Third, we have an important contrast between honest dialectical premises and philosophical ones or scientific ones: honest dialectical premises are reputable beliefs, philosophical and scientific premises must be true and knowable. Fourth, we have two apparently equivalent routes to scientific starting-points, one inductive, which starts from *raw starting-points*, and the other dialectic, which starts from reputable beliefs.

According to the official definition, reputable beliefs are "things that are believed by everyone, by the majority, or by the wise—either by all of them, or by most, or by the most well known and most reputable" (*Top*. I 1 $100^{b}21–23$). Just as the scientist should have a catalogue of scientific truths ready to hand from which to select the premises of his demonstrations, so a dialectician ought also to select premises "from arguments that have been written down and produce catalogues (*diagraphas*) of them concerning each kind of subject, putting them under separate headings—for example, 'Concerned with good,' 'Concerned with life'" (I 14 $105^{b}12–15$).

Clearly, then, there will be considerable overlap between the scientist's catalogue of raw starting-points and the honest dialectician's catalogue of reputable beliefs. For, first, things that are believed by reputably wise people are themselves reputable beliefs, and, second, any respondent would accept "the beliefs of those who have investigated the subjects in question—for example, on a question of medicine he will agree with a doctor, and on a question of geometry with a geometer" (*Top*. I 10 $104^{a}8–37$). The catalogues also differ, however, in that not all reputable beliefs need be true. If a proposition is a reputable belief, if it would be accepted by all or most people, it is everything an honest dialectician could ask for in a premise, since his goal is simply this: to show by honest deductions that a definition offered by any respondent whatsoever conflicts—if it does—with other beliefs the respondent has. That is why having a complete or fairly complete catalogue of reputable beliefs is such an important resource for a dialectician. It is

because dialectic deals with things only "in relation to belief," then, and not as philosophy and science do, "in relation to truth" (I 14 105^{b}30–31) that it needs nothing more than reputable *beliefs*.

Nonetheless, the fact that all or most people believe something leads us "to trust it as something in accord with experience" (*Div. Somn.* 1 426^{b}14–16), and—since human beings "are naturally adequate as regards the truth and for the most part happen upon it" (*Rh.* I 1 1355^{a}15–17)—as containing some truth. That is why having catalogued some of the things that people believe happiness to be, Aristotle writes: "Some of these views are held by many and are of long standing, while others are held by a few reputable men. And it is not reasonable to suppose that either group is entirely wrong, but rather that they are right on one point at least or even on most of them" (*NE* I 8 1098^{b}27–29). Later he generalizes the claim: "things that seem to be so to everyone, these, we say, *are*" (X 2 1172^{b}36–1173^{a}1). Raw starting-points are just that—raw. But when refined some shred of truth is likely to be found in them. So likely, indeed, that if none is found, this will itself be a surprising fact needing to be explained: "when a reasonable explanation is given of why an untrue view appears true, this makes us more convinced of the true view" (VII 14 1154^{a}24–25). It is the grain of truth enclosed in a reputable belief that a philosopher or scientist is interested in, then, not in the general acceptability of the surrounding husk, much of which he may discard.

The process of refinement in the case of a candidate explanatory starting-point is that of testing a definition of it against reputable beliefs. This may result in the definition being accepted as it stands or in its being altered or modified. The same process applies to the reputable beliefs themselves, since they may conflict not only with the definition but also with each other. Again, this may result in their being modified, often by uncovering ambiguities within them or in the argument supporting them, or by drawing distinctions that uncover complexities in these, or they may be rejected entirely, provided that their appearance of truth is explained away.

The canonical occasion for the use of honest dialectic, as of the Socratic elenchus and plain dialectic, is the examination of a respondent. The relevant premises for the questioner to use, therefore, are the reputable beliefs in his catalogue that his respondent will accept. Just how wide this set of beliefs is in a given case depends naturally on how accessible to untrained respondents the subject matter is on which he is being examined. We may all have some beliefs about thunder and other phenomena readily perceptible to everyone, which are—for that very reason—reputable. But about fundamental explanatory notions in an esoteric science we may have none at all.

When a scientist is investigating by himself the class of premises he will select from is the catalogue of *all* the raw starting-points of his science, despite a natural human inclination to do otherwise:

> Yet . . . people seem to inquire up to a certain point, but not as far as it is possible to take the puzzle. It is what we are all inclined to do, to make our inquiry not with an eye to the thing itself but with an eye to the person who says things that contradict him. For even a person inquiring on his own continues up to the point at which he is no longer able to contradict himself. That is why a person who is going to inquire correctly should be able to raise objections to a position by using objections that are special to the relevant genus, and this will be when he has acquired a theoretical grasp on all the differentiae. (*Cael.* II 13 $294^{b}6$–13)

Hence a scientist will want to err on the side of excess, adding any reputable belief that appears to have any relevance whatsoever to his catalogue. When he formulates definitions of candidate scientific starting-points from which he thinks he can demonstrate the raw ones, he must then examine himself to see whether he really does have the scientific knowledge of it that he thinks he does. If he is investigating together with fellow scientists, others may examine him: we all do better with the aid of co-workers (*NE* X 7 $1177^{a}34$). What he is doing is using honest dialectic on himself or having it used on him. But this, we see, is little different from the final stage—stage (4)—of the induction we looked at earlier. Induction, as we might put it, is in its final stage (possibly self-directed) honest dialectic.

In a famous and much debated passage, Aristotle writes:

> We must, as in the other cases, set out the things that appear to be so, and first go through the puzzles, and, in that way, show preferably all the reputable beliefs about these ways of being affected, or, if not all of them, then most of them and the ones with the most authority. For if the objections are resolved and the reputable beliefs are left standing, that would be an adequate showing. (*NE* VII 1 $1145^{b}2$–7)

The specific topic of the comment is "these ways of being affected," which are self-control and its lack as well as resilience and softness. Some people think that it applies only to this topic and should not be generalized, even though "as in the other cases" surely suggests a wider scope. And, as we can now see that scope is in fact entirely general, since it describes the honest

dialectical or inductive route to the starting-points of *all* the sciences and methods of inquiry, with *tithenai ta phainomena* ("setting out the things that appear to be so") describing the initial phase in which the raw starting-points are collected and catalogued.

Now that we know what it means for honest dialectic of the sort employed by the philosopher to provide a route to the explanatory starting-points of the philosophical sciences, we are in a position to see that it is precisely such a route that the *Metaphysics* takes to those of the science of being qua being. Since this route is the sort any science must take to prove its explanatory starting-points, the investigation undertaken in the *Metaphysics* is a scientific one. It is not, to be sure, a demonstration from the starting-points of being qua being, but rather a showing of the starting-points themselves, which, if successful, allows us to achieve the sort of puzzle-free grasp on them that the primary god, without having to work through any of the puzzles that muddy our vision, has on the starting-point of everything—himself.

The scientific starting-points we have been discussing are those that, because they are special to a specific first-order science, are grounded in the first-order genus with which it deals. These are the ones that, because they are analogous to those of other first-order sciences, have more general higher-order versions grounded in higher-order genera, or categories. But there are other sorts of scientific starting-points, such as the Principle of Non-contradiction and other starting-points of demonstration, that all first-order sciences directly use, but that, precisely because they are not grounded in a first-order genus, none deals with (B 3 $996^{b}26$–$997^{a}11$). Similarly, there are the various attributes that hold of all beings qua beings, rather than qua being members of a first-order genus, such as "prior and posterior, genus and species, whole and part, and others of this sort" (Γ 2 $1005^{a}15$–18). Each of these, too, must be defined by the science of being qua being in a way that resolves the puzzles to which they give rise. This work is largely of the sort that we would classify as conceptual and think of as a priori—*logikôs* as Aristotle might say (Z 4 $1029^{b}13$n). But this should not distract us from the fact that its results must be grounded not in concepts but, like those of mathematics, which has the same a priori look, in empirical reality—in being itself considered qua being.

The Audience for the Metaphysics

In the *Nicomachean Ethics*, Aristotle famously tells us that it is not a work for young or immature people, inexperienced in the practical matters with which it deals:

> But each person correctly discerns the things he knows and is a good discerner of these. Hence a person well educated in a given area is a good discerner *in that area,* while a person well educated in all areas is an unconditionally good discerner. That is why a young person is not a suitable audience for politics. For he has no experience of the actions of life, and the accounts are in accord with these and concerned with these. (*NE* I 3 $1094^{b}25–1095^{a}4$)

It is less often recognized that he issues a similar warning in the *Metaphysics*, and that here, as in the *Ethics*, he makes being well educated a prerequisite:

> That is why we should already have been well educated in what way to accept each argument, since it is absurd to look for scientific knowledge and for the way characteristic of scientific knowledge at the same time—and it is not easy to get hold of either. Accordingly, we should not demand the argumentative exactness of mathematics in all cases but only in the case of things that include no matter. (α 3 $995^{a}12–16$)

But whereas in the case of ethics and politics the relevant experience is practical, in metaphysics—or, rather, in the case of the science of being qua being—it is theoretical. There we need experience in life. Here we need experience in the sciences. And in both we need the sort of training in honest dialectic, as in logic and what we would call the philosophy of science, for which the treatises in the so-called *Organon* (*Categories*, *De Interpretatione*, *Prior* and *Posterior Analytics*, *Topics*, and *Sophistical Refutations*) might serve—or might once have served—as a textbook.

There is much in these treatises, as in others, then, that readers of the *Metaphysics* are supposed to know already. When it is simply information or arguments that are at issue, notes can provide what we need. But there is more to being well educated than being well informed; we must also be the intellectual equivalent of morally virtuous.

When dialectic has done its testing of the opposing sides of a puzzle, we hear in the *Topics*, it "only remains to make a correct choice of one of them" (VIII 14 $163^{b}11–12$). And what enables us make such a choice is the "naturally good disposition (*euphuia*)" that enables people to "discern correctly what is best by a correct love or hatred of what is set before them" ($163^{b}15–16$). The reference to "what is best" suggests that this disposition is the *euphuia* also referred to in the following passage:

> His seeking of the end in question is not self-chosen, rather, we must be born possessed of a sort of sight by which to discern correctly and choose what is truly good, and a person in whom this by nature operates correctly is naturally well disposed (*euphuês*). For this is what is greatest and noblest and is not the sort of thing we can get from someone else or learn but the sort of thing whose condition at birth is the one in which it will later be possessed and, when it is naturally such as to be in a good and noble condition, will be the naturally good disposition (*euphuia*) in its complete and true form. (*NE* III 5 $1114^{b}5$–12)

And that, in fact, is what the distinction between philosophy and sophistry, which uses all of plain dialectic's resources, might lead us to expect, since "philosophy differs from dialectic in the way its capacity is employed, and from sophistic in the life it deliberately chooses" (Γ 2 $1004^{b}23$–25).

Now a deliberate choice of how to live is at bottom a choice of an ultimate end or target for our life: "everyone who can live in accord with his own deliberate choice should posit some target for living nobly, whether honor, reputation, wealth, or education, which he will look to in doing all his actions" (*EE* I 2 $1214^{b}6$–9). And what "teaches *correct* belief" about this end or target, thereby insuring that the deliberate choice of it is correct, is "natural or habituated virtue of character" (*NE* VII 8 $1151^{a}18$–19). It is this, we may infer, in which the naturally good disposition under discussion consists. Hence if we possess it, and it has been properly developed by a good upbringing and education, when we hear from ethics that the starting-point it posits as the correct target for a human life is "activity of the soul in accord with virtue, and if there are more virtues than one, in accord with the best and most complete" (I 7 $1098^{a}16$–18), we will accept it as true, and so strive to clear away the puzzles in such a way as to sustain its truth. If we do not possess it, we will reject this starting-point, so that in our choice between the conflicting sides of these puzzles, we will go for the wrong ones: "the truth in practical matters must be discerned from the facts of our life, since these are what have the controlling vote. When we examine what has been previously said, then, it must be discerned by bringing it to bear on the facts of our life, and if it is in harmony with the facts, we should accept it, but if it clashes, we should suppose it mere words" (X 8 $1179^{a}17$–22).

In the *Rhetoric*, we learn of an apparently different sort of good natural disposition which might seem from the company it keeps to be an exclusively intellectual trait: "good natural disposition, good memory, readiness to learn, quick-wittedness . . . are all productive of good things" (I 6 $1362^{b}24$–25). When it comes to solving dialectical problems bearing on "truth and knowledge," we might conclude, such apparently intellectual

good natural disposition is all we need, even if, when it comes to those bearing on "pursuit and avoidance" (*Top.* I 11 104^{b}1–2), we also need its apparently more ethical namesake. It would be a mistake, though, to rush to this conclusion. For the ultimate starting-point and cause that the *Metaphysics* finally uncovers, which is at once the active understanding of active understanding, the prime unmoved mover, and the primary god, is the ultimate cause and starting-point for beings qua beings—*all of them*. And that means that it is our ultimate starting-point and cause too.

When we look at our lives from the outside, so to speak, from the theoretical point of view, if the *Metaphysics* is right, we see something amazing, namely, that the heavenly bodies, those bright denizens of the starry heavens above, are living beings who, like us, are moved by a desire for the best good—for the primary god (Λ 7). When we view it from the inside, from that perspective from which "the truth in practical matters" can alone be discerned, the *Ethics* tells us that we will find that we are moved by the same thing—that as the good for the heavenly bodies consists in contemplating the primary god, so too does our happiness: "The activity of a god, superior as it is in blessedness, will be contemplative. And so the activity of humans, then, that is most akin to this will most bear the stamp of happiness" (*NE* X 8 1178^{b}21–23). But Aristotle's hand is tipped even within the *Metaphysics* itself:

> [Active understanding rather than receptive understanding] seems to be the divine element that understanding possesses, and contemplation seems to be most pleasant and best. If, then, that good state [of activity], which we are sometimes in, the [primary] god is always in, that is a wonderful thing, and if to a higher degree, that is yet more wonderful. But that is his state. And life too certainly belongs to him. For the activity of understanding is life, and he is that activity; and his intrinsic activity is life that is best and eternal. We say, then, that the god is a living being that is eternal and best, so that living and a continuous and everlasting eternity belong to the god, since this is the god. (Λ 7 1072^{b}22–30)

That is why "we should not, in accord with the makers of proverbs, 'think human things, since you are human' or 'think mortal things, since you are mortal' but rather we should as far as possible immortalize, and do everything to live in accord with the element in us that is most excellent" (*NE* X 7 1177^{b}31–34), this being our understanding—our divine *nous*.

Aristotle arrives at this great synthesis of theory and practice, as we saw, on empirical grounds, by reflecting on, and drawing inductive conclusions

from, the various sciences, theoretical, practical, and productive, as they existed in his day. He is not doing "armchair" metaphysics, but rather drawing on his own vast knowledge of these sciences to reach a unified explanatory picture of being as such and our place in it as practical agents and theorizers. If we followed in his footsteps, drawing on *our* sciences, from theoretical physics to engineering, economics, and ethics, we would not reach his conclusions about the primary starting-points and causes of beings qua beings. If we are to be Aristotelians now it cannot be by parroting Aristotle's theories. Instead, it must be by taking him as a paradigm of how we might be philosophers ourselves—a "paradigm in the heavens," so to speak, "for anyone who wishes to look at it and to found himself on the basis of what he sees" (Plato, *Rep*. IX 592b1–2).

Metaphysics

Book Alpha (I)

A 1

980ª21 All humans by nature desire to know.[1] An indication of this is our liking for the perceptual capacities.[2] For even apart from their utility, these are liked because of themselves—and most of all the one because of the eyes.[3] For it is not only in order to do an action, but even when we are not going to do anything whatsoever, that we choose sight over (one might 25 almost say) all the others. The cause of this is that of all perceptual capacities it enables us to know most fully and makes clear many differences.[4]

By nature, animals are born possessed of perception.[5] In some of them, memory does not come about from this, but in others it does come about.[6] And because it does, they are more practically-wise and 980ᵇ21 better at learning than those incapable of remembering.[7] Practically-wise, but outside the reach of teaching, are the ones that cannot hear sounds (for example, bees and whatever other kind (*genos*) of animal may be like them), whereas those that in addition to memory have this 25 perceptual capacity can be taught.[8]

Now, the other animals live by appearances and memories, and have but a small share in experience, whereas humankind lives also by craft knowledge and rational calculations.[9] From memories experience comes about in humans, since many memories of the same thing finally bring about the capacity of one experience.[10] Indeed, experience 981ª1 seems pretty much similar to scientific knowledge and craft knowledge.[11] But scientific knowledge and craft knowledge come to humans *through* experience.[12] For "experience made craft," as Polus says, "and lack of experience, luck."[13]

5 Craft knowledge comes about when, from many intelligible objects belonging to experience, one universal supposition about similar things comes about.[14] For to have a supposition that when Callias was sick with this disease this treatment benefited him, and similarly with Socrates and many other particular cases, is a matter of experience.[15] But to suppose that it benefited *everyone* of a certain sort, marked 10 off by a single form, suffering from a certain disease (for example, phlegm-filled or bilious people when burning with a fever), is a matter of craft.[16]

With a view to action, then, experience seems no different from craft knowledge—on the contrary, we even see experienced people

being more successful than those who have an account but are without experience.[17] The cause of this is that experience is knowledge of particulars, whereas craft knowledge is of universals, and actions and productions are all concerned with particulars.[18] For the doctor does not cure a *human*, except coincidentally, but Callias or Socrates or someone else spoken of in that way, who happens coincidentally to be a human.[19] If, then, someone without experience has the account and knows the universal, but does not know the particular included under it, he will often make an error in treatment, since it is the particular that admits of treatment.[20]

Nevertheless, we regard *knowledge* and *comprehension* as characteristic of craft rather than of experience, and take it that craftsmen are wiser than experienced people, on the supposition that in every case wisdom follows along rather with knowledge than with experience. This is because craftsmen know the cause, whereas experienced people do not.[21] For experienced people know the that but do not know the why, whereas craftsmen know the why, that is, the cause.[22]

It is also because of this that we consider the architectonic practitioners in each craft to be more estimable, to know in a yet more full sense, and to be wiser than the handicraftsmen, because they know the causes of the things they produce.[23] The handicraftsmen, by contrast, we consider to be like some sort of inanimate things that produce without knowing what they produce, in the way, for example, that fire burns. But whereas inanimate things produce each result by a sort of nature, the handicraftsmen do so by habit—the supposition being that architectonic craftsmen are wiser not in terms of being practically efficient, but in terms of having the account themselves and knowing the causes.[24] On the whole too an indication of the person who knows, as opposed to the person who does not know, is his capacity to teach.[25] That is why we think craft knowledge to be more like scientific knowledge than experience is, since craftsmen can teach, while experienced people cannot.

Furthermore, we do not think that any perceptual capacities whatsoever constitute wisdom, even though they are most in control, at any rate of the knowledge of particulars.[26] Still, they do not tell us the why of anything (for example, why fire is hot), but only that it is hot.

At first, then, anyone who discovered any sort of craft that went beyond the common perceptual capacities was quite likely wondered at by people, not only because there was something useful in his discoveries, but also because he was thought wise and superior to others. But as more crafts were discovered, some of which were related to necessities, others to passing the time, it is quite likely that the discoverers

of the latter were always thought to be wiser, because their sciences did not aim at utility.[27] Hence when all such crafts were already developed, the sciences that aim neither at pleasure nor at necessities were discovered, first in the places where people had leisure. That is why the mathematical crafts first arose in Egypt, since there the priestly class were allowed to be at leisure.[28]

We have said in the *Ethics* what the difference is between craft knowledge, scientific knowledge, and other things of the same kind (*genos*).[29] What our present account is for the sake of, however, is this: Everyone takes what is called "wisdom" to be concerned with the primary causes and the starting-points.[30] And so, as we said earlier, the person of experience seems wiser than those who have any perceptual capacity whatsoever, a craftsman than experienced people, an architectonic craftsman than a handicraftsman, and theoretical sciences than productive ones. So it is clear that theoretical wisdom is scientific knowledge of certain sorts of starting-points and causes.[31]

A 2

Since this is the science we are inquiring into, this is what we should investigate, namely, what sorts of causes and what sorts of starting-points are the concern of the science that is theoretical wisdom. Well, if we were to get hold of the suppositions we have about the theoretically-wise person, perhaps the answer will thereby become more evident.[32]

First, then, we take it that [1] what a wise person has scientific knowledge about is *all things*, insofar as they admit of it, without his having particular scientific knowledge of them.[33] Next, we take it that [2] the person who has the capacity to know difficult things, that is, things that are not easy for humans to know—*he* is wise.[34] For perception is common to all, which is why it is easy and involves no wisdom. Further, we take it that someone is wiser in any science if [3] he is a more exact knower of it and [4] a better teacher of the causes.[35] Also, we take it that among the sciences [5] the one choiceworthy for the sake of itself, and for the knowing of it, is more theoretical wisdom than one choiceworthy for the sake of its results. Also, we take [6] a more ruling science to be wisdom more than a subordinate one. For a wise person should prescribe, not be prescribed to, and should be obeyed by the less wise, not obey someone else. Such, then, are the sort and number of suppositions we hold about theoretical wisdom and theoretically-wise people.

Of these, [Response 1] scientific knowledge of all things necessarily belongs to the person who most of all has universal scientific knowledge, since he in a way knows all the things that fall under it.[36] [R2] The most universal things of all, however, are pretty much the most difficult for humans to know, since they are furthest from perception.[37] [R3] And the most exact of the sciences are the ones concerned most of all with the primary things, since the sciences which proceed from fewer things (for example, arithmetic) are more exact than those that proceed from an addition (for example, geometry).[38] [R4] But then, too, the one that provides theoretical scientific knowledge of the causes is more teachable, since teaching is what those people do, that is, those who state the causes of each thing. [R5] And knowing or knowing scientifically for its own sake most of all belongs to the science of what is most scientifically knowable of all. For the person who chooses to know scientifically because of itself will most of all choose to have what is most of all scientific knowledge, and this is the science of what is most scientifically knowable of all. And what is most scientifically **982^{b}1** knowable of all are the primary things and causes, since it is through these and proceeding from these that we know the other things, not these because of the ones that fall under them.[39] [R6] But the most ruling of the sciences—that is, the one that is ruling rather than subordinate—is the one that knows that for the sake of which each thing is to be done, and this is the good of each of them, and in general the best good in all of nature.[40]

So based on all that has been said, the name we are inquiring into applies to the same science [as has all these features]. For this must be the one that gets a theoretical grasp on the primary starting-points and causes, and the good or the for-the-sake-of-which is one of these causes.[41]

That it is not a productive science is clear too from those who first turned to philosophy, since it is because of wondering at things that humans, both now and at first, began to do philosophy.[42] At the start, they wondered at those of the puzzles that were close to hand, then, advancing little by little, they puzzled over greater issues, for example, about the attributes of the moon and about issues concerning the sun and stars, and how the universe comes to be.[43] Someone who puzzles or wonders, however, thinks himself ignorant (it is because of this, indeed, that the philosopher is in a way a mythlover, since myth is composed of wonders).[44] So if indeed it was because of [a desire] to avoid ignorance that they engaged in philosophy, it is evident that it was because of [a desire] to know that they pursued scientific knowledge, and not for the sake of some sort of utility.

What in fact happened is witness to this. For it was when pretty much all the necessities of life, as well as those related to ease and passing the time, had been supplied that such wisdom began to be sought.[45] So clearly we do not inquire into it because of its having another use, but just as a human being is free, we say, when he is for his own sake and not for someone else, in the same way we pursue this as the only free science, since it alone is for its own sake.[46]

It is because of this indeed that the possession of this science might be justly regarded as not for humans, since in many ways the nature of humans is enslaved, so that, according to Simonides, "a god alone can have this privilege," and it is not fitting that a human should not be content to inquire into the science that is in accord with himself.[47] If, then, there is something in what the poets say, and jealousy is natural to the divine, it would probably occur in this case most of all, and all those who went too far [in this science] would be unlucky. The divine, however, cannot be jealous—but, as the proverb says, "Bards often do speak falsely."[48] Moreover, no science should be regarded as more estimable than this.[49] For the most divine science is also the most estimable. And a science would be most divine in only two ways: if the [primary] god most of all would have it, or if it were a science of divine things.[50] And this science alone is divine in both these ways. For the [primary] god seems to be among the causes of all things and to be a sort of starting-point, and this is the sort of science that the [primary] god alone, or that he most of all, would have.[51] All the sciences are more necessary than this one, then, but none is better.[52]

The acquisition of it, however, must in a way leave us in a condition contrary to the one in which we started our search. For everyone, as we said, starts by wondering at something's being the way it is, just as people do at those wondrous automata, when they do not have a theoretical grasp on their cause, or at the turnings of the sun, or at the incommensurability of the diagonal (for it seems a wonder to everyone that a more-than-minimal magnitude is not measurable).[53] It is in the contrary and proverbially the better condition, however, that we must end up, as happens in those other cases too when people learn [the cause]. For nothing would make a man who knows geometry wonder more than if the diagonal *were* to turn out to be commensurable.[54]

We have stated, then, what the nature is of the science we are inquiring into, and what the target is that our inquiry and our whole methodical inquiry must hit.[55]

A 3

It is evident, then, that we must acquire scientific knowledge of the causes that are starting-points, since we say that we know each thing when we think we know its primary cause.[56] Now, things are said to be causes in four ways.[57] In one way, we say the substance or the essence is the cause, since the ultimate thing to which the why leads us is the account, and the why that is primary is the cause and starting-point.[58] In another, it is the matter or the underlying subject.[59] In a third, it is the starting-point from which the movement derives. In a fourth, the cause opposite to this, that is, the for-the-sake-of-which and the good, since this is the end of all coming to be and of all movement.[60]

We got an adequate theoretical grasp on these in our works on nature.[61] All the same, let us call also on those prior to us who undertook the investigation of beings and philosophized about the truth.[62] For it is clear that they too speak of certain starting-points and causes. So reviewing them will be of some assistance to the present methodical inquiry, since either we shall discover some other kind (*genos*) of cause or trust all the more in those we mentioned just now.

Of those who first philosophized, then, most thought that the starting-points of all things were of the material kind (*eidos*) only.[63] For that from which all beings come, and from which as a first thing they come to be and into which they pass away in the end, the substance that persists throughout as an underlying subject while its attributes change—this, they say, is the element and this is the starting-point of beings.[64] And because of this they think that nothing either comes to be or is destroyed, since a nature of this sort is always preserved. Just as we do not say either that Socrates unconditionally comes to be when he comes to be noble or musical or that he is destroyed when he loses these states, because the underlying subject—Socrates himself—persists, so too they do not say that anything does so in the other cases.[65] For there must be some nature, whether one or more than one, from which the other things come to be while it is preserved.

They do not all agree, however, on the number and kind (*eidos*) of such a starting-point. Thales, the one who started this sort of philosophy, says it is water (because of this, he also declared that the earth rests on water), perhaps reaching this supposition from seeing that the nourishment for all things is moist, that the hot itself comes to be from this, and what is alive lives by this (and what they come to be from is starting-point for all).[66] Because of this, then, he reached this

supposition, and because the seeds of all things have a moist nature, and water is the starting-point of the nature of moist things.

Some people think that even the ancients who lived long before the present generation and who first theologized held similar beliefs about nature, since they made ocean and Tethys the parents of coming to be, and made the gods swear their oath by the water they called Styx.[67] For what is oldest is what is most estimable, and what is most estimable is what we swear an oath by.[68] It is perhaps unclear that this belief about nature is in any way ancient or even old, but Thales at any rate is said to have declared this about the primary cause (for no one would consider Hippo worthy of inclusion with these, because of the shabbiness of his thought).[69]

Anaximenes and Diogenes posit air as prior to water and as more than anything else the starting-point of the simple bodies.[70] Hippasus of Metapontium posits fire, as does Heraclitus of Ephesus.[71] Empedocles, however, posits four things, positing earth along with those already mentioned as a fourth (for these, he says, always persist and do not come to be, except in quantity or smallness, aggregating into one and disaggregating from one).[72]

Anaxagoras of Clazomenae, who was prior to Empedocles in age but in works later, says that the starting-points are unlimited.[73] For he says that pretty much all the homoeomerous things (like water and fire) come to be and are destroyed in this way, namely, through aggregation and disaggregation alone.[74] Otherwise, they neither come to be nor are destroyed but persist and are eternal.

From this, we might think that the only cause is the so-called material kind (*eidos*). But as people progressed thusly the facts themselves showed them the way and compelled them to inquire further.[75] For however much all coming to be and passing away may be from some one thing (or even from more than one thing), *why* does this happen? That is, what is the *cause*? For at any rate the underlying subject itself does not make itself change. I mean, for example, that neither the wood nor the bronze is a cause of either of them changing, nor does the wood make a bed or the bronze a statue, but something else is the cause of the change, and to look for this is to look for another starting-point—the starting-point from which the movement derives, as we would say.[76]

Well then those who at the very start latched on to this methodical inquiry, and said that the underlying subject was one, had no misgivings about this. But *some* of those who said that it was one, as if defeated by this inquiry, said that the one, that is, nature as a whole, is immovable—not only as regards coming to be and passing away (for this is an ancient view agreed to by all), but also as regards every other

sort of change, and this view is special to them.[77] Of those who said **984ᵇ1**
that the universe is one, then, none managed to discover a cause of this sort, except perhaps Parmenides, insofar as he posited causes not only as one but also somehow as two.[78] Accordingly, for those who make a plurality [of underlying subjects] it is more possible to state [what this sort of cause is]—for example, for those [who posit] hot and cold or 5
fire and earth. For they treat fire as having a nature that initiates movement, and treat water, earth, and things of that sort in the contrary way.

After these thinkers and these sorts of starting-points, which were found inadequate to generate the nature of beings, people were again compelled by the truth itself, as we said, to look for the next sort of 10
starting-point.[79] For that the good or noble state of some beings—or the coming to be in that state of other ones—should have fire or earth or anything else of that sort as its cause is presumably not probable, nor is it probable that these people should have thought so.[80] On the other hand, to turn over so important a fact to chance or luck could not be correct either.[81] When one person said, then, that understanding was present (just as in living things) in nature too, as the cause of the cos- 15
mos and of all its order, he seemed like a sober person by contrast with his improbability-uttering predecessors.[82] We know that Anaxagoras explicitly adopted these accounts, but Hermotimus of Clazomenae is "charged" with speaking that way earlier.[83] Those who took up the mat- 20
ter in this way thus posited the cause of their noble state as a starting-point of beings, and at the same time that this is the sort of cause from which the movement starts for them.

A 4

We might suspect that Hesiod was the first to look for this sort of thing, or someone else who posited love (*erôs*) or appetite among beings as a starting-point, as, for example, Parmenides also did.[84] For he too, in describing the coming to be of the universe, says that first "was devised 25
love (*erôs*) among the gods."[85] And Hesiod says,

> Of all things the very first that came to be was chaos, and then
> Broad-breasted earth,
> And love (*erôs*), preeminent among all the immortals,

on the supposition that there must be some cause among beings to move and draw things together.[86] (As for the way these people 30
should be arranged with regard to priority, let us leave it till later to discern.[87])

But since it was evident that the contraries of good things were also present in nature (not only order and nobility but also disorder and
985ᵃ1 baseness, and more bad things than good ones, and more base things than noble ones), someone else accordingly introduced love (*philia*) *and* strife as each singly the cause of one of the two sorts of things.[88] For if we were to follow and grasp the *thought* and not the inarticu-
5 late words of Empedocles, we would find that love (*philia*) is the cause of good things and strife of bad ones.[89] So, if we were to claim that Empedocles in a way says, and was the first to say, that the good and the bad are starting-points, we would perhaps be correct—if indeed the cause of all good things is the good itself.[90]

10 These people, then, as we say, evidently latched on to two of the causes we distinguished in our works on nature, namely, the matter and the starting-point of movement.[91] But they did so vaguely and in a not at all perspicuous way, like untrained people in fights.[92] For these
15 too, as they circle their opponents, often strike good blows, but they do not do so in virtue of scientific knowledge, just as the others do not seem to know what they are saying, since they apparently make pretty much no use of these causes, except to a small extent.[93]

For Anaxagoras uses understanding as a *deus ex machina* as regards cosmic production, and, when he is puzzled about what the cause is due to which something holds of necessity, he drags understanding in,
20 but in other cases he makes anything rather than understanding the cause of things that come to be.[94]

As for Empedocles, although he uses these causes to a greater extent than Anaxagoras, he neither uses them adequately nor finds any consistency in them. At any rate, love (*philia*) often disaggregates things for him, while strife aggregates them. For whenever
25 the universe is divided up into its elements because of strife, the fire is aggregated into one, and so is each of the other elements, and whenever things come together into one again under the influence of love (*philia*), it is necessary that the parts from each get disaggregated again.[95]

Empedocles, then, going beyond his predecessors, was the first to
30 introduce the dividing of this cause, not making the starting-point of the movement one thing, but distinct and contrary ones. Further, he was the first to say that the kinds (*eidos*) of matter, the so-called elements, were four. Yet he does not *use* four but treats them as two only, fire by itself, on the one hand, and its opposites—earth, air, and water—
985ᵇ1 taken as one nature, on the other (as we may gather from studying his verses).[96] He, then, as we say, spoke about the starting-points in this way and as being this many.

Leucippus, however, and his associate Democritus say that the full and the void are the elements, calling the one "being," and the other "not being," and, of these, the full or the solid is being, while the void is not being (that is why they also say that being no more *is* than not being, because the body no more *is* than the void), and that these, as matter, are the causes of beings.[97] And just as those who make the underlying substance one generate the other things by means of its attributes, positing the rare and the dense as starting-points of these attributes, in the same way, these people too say that the differentiae are the causes of the other things. And these differentiae, they say, are three—shape, order, and position.[98] For they say that being is differentiated by "rhythm," "contact," and "turning" alone. And of these rhythm is shape, contact is order, and turning is position.[99] For A differs from N in shape, AN from NA in order, and Z from N in position. But the question of movement—where it comes from and in what way it belongs to beings—these people, in a quite similar way to the others, carelessly neglected.[100]

So concerning the two causes, as we say, this seems to be as far as the earlier philosophers went in their inquiry.

A 5

Among these thinkers and before them, the so-called Pythagoreans were the first to latch on to mathematics.[101] They both advanced these inquiries and, having been brought up in mathematics, thought that its starting-points were the starting-points of all beings. Since [1] among these starting-points the numbers are by nature primary, and since [2] they seemed to get a theoretical grasp on many similarities to beings in the numbers, and to things that come to be, more so than in fire, earth, or water (for example, that such-and-such an attribute of numbers is justice, that such-and-such an attribute is soul and understanding, whereas another one is appropriate time, and—one might also say—each of the rest likewise), and, further, [3] seeing in harmonies attributes and ratios that are found in numbers—since, then, [2] the other things seemed to have been made like numbers in the whole of their nature, and [1] numbers were primary in the whole of nature, they took the elements of numbers to be the elements of all beings, and [3] the whole heaven to be harmony and number.[102]

And whenever they found consistencies and harmonies in the numbers with the attributes and parts of the heaven and with the whole arrangement of the cosmos, they collected these together and fitted

them into their scheme.[103] And if there was something missing, they added it eagerly, in order to make their work a connected whole. I mean, for example, that since the number ten seems to be complete and to encompass the whole nature of the numbers, they say that the bodies that move through the heaven are ten, but because those that are visible are only nine they make anti-earth the tenth.[104]

We have discussed these issues more exactly elsewhere.[105] But we are going over them again in order that we may grasp on the part of these thinkers too the starting-points they posit, and in what way these fall under the causes we have been speaking about. It is evident, then, that they too consider that number is a starting-point for beings both as matter and as attributes and states, that the elements of number are the odd and the even, and that of these the odd is limited and the even unlimited.[106] They consider that the one comes from both of these (for it is both odd and even), that number comes from the one, and that the whole of the heaven (as has been said) is numbers.[107]

Others among these same thinkers say that there are ten starting-points arranged in two columns:[108]

limited	unlimited
odd	even
one	plurality
right	left
male	female
resting	moving
straight	curved
light	darkness
good	bad
square	rectangular

This is the way in which Alcmaeon of Croton also seems to have taken things, and either he got this account from them or they got it from him.[109] For Alcmaeon too made claims quite similar to theirs, since he says that most things relating to humans come in twos, mentioning not definite contraries, as these thinkers did, but random ones—for example, white and black, sweet and bitter, good and bad, great and small. He threw out indefinite suggestions about the rest, whereas the Pythagoreans made claims both about how many contraries there are and what they are.[110]

From both of these, then, we can grasp this much, that the contraries are the starting-points of beings, and from the first lot how many and what they are. Yet in what way these can be brought together

and related to the causes we have mentioned has not been articulated by them in a perspicuous way. They seem, however, to range the elements among the material kinds (*eidos*). For it is from these as components that they say the substance of things is composed and molded.

As for the ancients, then, and those who spoke of the elements as plural, we can get an adequate theoretical grasp on their thought from these considerations. There are some, however, who made claims about the universe as being of a singular nature—although not all of them did so in an equally correct way or in a way equally in accord with the facts of nature.[111] So an account of these thinkers is in no way appropriate to our present investigation of causes.[112] For whereas some of the physicists take it that being is one thing, yet at the same time posit coming to be from the one thing as from matter, these thinkers proceed in another way.[113] For the former are positing movement in addition (making the universe *come to be*), whereas the latter say that it is immovable.[114]

However, this much at least does properly belong to the present investigation: Parmenides seems to latch on to what is one in account, Melissus onto what is one as regards the matter (which is why Parmenides says that it is limited, Melissus that it is unlimited). Xenophanes, by contrast, who was the first of these monists (Parmenides is said to have been his student), said nothing perspicuous, nor does he seem to have touched upon the nature of either of these causes, but with a view to the heaven as a whole he says that the one is the god.[115] Now these thinkers, as we said, must be set aside for the purposes of the present investigation—two of them entirely as being a little boorish, namely, Xenophanes and Melissus. Parmenides, however, seems perhaps to speak with more insight. For claiming that beyond being there is no such thing as not being, he thinks that being is necessarily one and that nothing else exists (about this we have spoken more perspicuously in our works on nature).[116] But finding himself compelled to follow the things that appear to be so, he takes it that there is one thing according to reason but more than one according to perception, and now posits two causes and two starting-points, hot and cold—in other words, fire and earth.[117] And of these he ranges the first with being and the second with not being. **987ᵃ1**

So from what has been said, and from the account of the wise men who have now sat in council with us, we have got this much: From the first thinkers we got that the starting-point is corporeal (for water and fire and things of that sort are bodies), some positing one corporeal starting-point, others more than one, but both putting them as

such among the material kinds (*eidos*). From some, who posit both this cause and besides it the one from which the movement derives, which we got as one from some, and from others as two.[118] So up to the Italians, and apart from them, the rest spoke rather vaguely about these things except that, as we said, they have in fact made use of two causes, and some made the second of them (the one from which the movement derives) one, others two.[119]

The Pythagoreans have spoken of the starting-points as two in the same way, but added this much, which is in fact special to them.[120] They thought that the limited and the unlimited were not certain distinct natures, such as fire or earth or anything else of that sort, but that the unlimited itself and the one itself were the substance of the things of which they were predicated, and that is why number was the substance of all things.[121] On these topics, then, they made claims this way, and so about the what-it-is they also started to speak and to give definitions, even if they treated the topic too simply.[122] For they defined superficially and also the first subject to which a given definition applied, this they believed to be the substance of the thing—as if someone were to think that double and two were the same, because in the first instance double belongs to two.[123] But being double and being two are presumably not the same. Otherwise, the one will be many—a consequence that they in fact drew.

From the earlier thinkers, then, we can grasp this much.

A 6

After the philosophies we have mentioned came the work of Plato. In most respects it followed these thinkers but also had special features that distinguished it from the philosophy of the Italians. For having been from his youth familiar first with Cratylus and the Heraclitean beliefs that all perceptibles are always flowing, and that there is no scientific knowledge concerning them, these views he also held later.[124] The work Socrates did, on the other hand, was concerned with ethical issues, not at all with nature as a whole. In these, however, he was inquiring into what is universal and was the first to fix his thought on definitions. Plato, accepting him [as a teacher], took it that this fixing is done concerning other things and not the perceptible ones, since it is impossible for there to be a common definition of any perceptibles, as *they* at any rate are always changing.[125] He, then, called beings of this other sort "Ideas," and the perceptible ones are beyond these and are all called after these.[126] For the many things that have the same name as the Forms are [what they are] through participation in them.[127]

As for participation he changed only the name.[128] For the Pythagoreans say that beings are [what they are] by imitating the numbers, whereas Plato says that they are [what they are] by participation, changing the name.[129] What this participation or this imitation of the Forms could *be*, however, they left an open question.

Further, apart from both the perceptibles and the Forms are the objects of mathematics, he says, which are intermediate between them, differing from the perceptible ones in being eternal and immovable, and from the Forms in that there are many similar ones, whereas the Form itself in each case is one only.[130] And since the Forms are causes of the other things, he thought that their elements were the elements of all beings. It is as matter, then, that the great and the small were starting-points, and as substance, the one.[131] For generated [as they are] from the great and the small by participating in the one, the Forms are the numbers.[132]

In saying that the one is substance, and is not by being *another* thing said to be one, he spoke in a quite similar way to the Pythagoreans, and in saying that the numbers are the causes of the substance of other things he agreed with them.[133] But instead of making the unlimited one thing making it a dyad from the great and the small is special to him. Further, in his view too the numbers are beyond the perceptibles, whereas they say that the things themselves are numbers, and do not place the objects of mathematics between them.[134]

The fact that he made the one and the numbers be beyond the things, not treating them as the Pythagoreans did, and that he introduced the Forms, were due to his investigation of accounts (for the previous thinkers had no share of dialectic), and the fact that he made the other nature a dyad was because he thought that the numbers, except those that were prime, were naturally well disposed to being generated from this as from some plastic material.[135] And yet what *happens* is the contrary. For it is not reasonable that it should happen in the way Plato describes. For, as things stand, they make many things from the matter, whereas the Form generates only once, but what is evident is that from one matter comes one table, while the person who imposes the Form, though he is one, makes many.[136] And the relation of male to female is similar. For the female is impregnated by one copulation, but the male impregnates many. And yet these are imitations of those starting-points.[137]

About the topics of inquiry, then, Plato described things this way. It is evident, however, from what has been said, that he made use of only two causes, that of the what-it-is and that of the matter (for the

Forms are the causes of the what-it-is of other things, as the one is of the Forms).[138] And what the underlying matter is, of which the Forms are said in the case of the perceptibles, and the one in the case of the Forms, is evidently a dyad, namely, the great and the small.[139] Further, he has assigned the cause of good and bad to both elements, one to each, which we say some of the previous philosophers also looked to do—for example, Empedocles and Anaxagoras.[140]

A 7

We have, then, briefly and in summary fashion gone through which thinkers have spoken and in what ways about the starting-points and about the truth.[141] Nonetheless we have got this much at least from them, that of those who have spoken about a starting-point and a cause none has mentioned any outside of those we distinguished in our works on nature, rather it is evident that they are all in some vague way touching upon these.[142] For some speak of the starting-point as matter, whether they posit one or many, and whether they make it a body or something incorporeal—for example, Plato speaks of the great and the small, and the Italians of the unlimited, Empedocles of fire, earth, water, and air, Anaxagoras of the unlimited number of homoeomerous things. All these thinkers, then, latched on to this sort of cause, and so too did those who spoke of air, fire, water, or something denser than fire and more fine-grained than air—for some have also said that the primary element is like this.[143] So these thinkers latched on to this cause alone, and certain others onto the starting-point from which movement derives—for example, those who made love (*philia*) and strife or understanding and love (*erôs*) a starting-point.

But the essence and the substance no one has presented in a perspicuous way, although those who posit the Forms speak of it the most.[144] For they neither take the Forms as matter for the perceptibles, and the one as matter for the Forms, nor these as the starting-point from which movement comes about (for they say that these are rather causes of immobility and of being at rest); instead, the Forms provide the essence for each of the other things, and the one provides it for the Forms.

And that for the sake of which actions, changes, and movements take place they speak of as in a way a cause, but not in this way—that is, not in the way in which it is its *nature* to be a cause. For those who speak of understanding or love (*philia*) posit these causes as good, but they do not speak as if anything is or comes to be *for the sake of*

these things, but as if movements arise from them. In the same way too those who say that the one or being is such a nature say that it is a cause of the substance, but not that anything is or comes to be *for its sake*, so that in a way they do and in a way they do not say that the good is a cause, since they do not say it is so unconditionally but coincidentally.[145]

It is clear, then, all these thinkers also seem to testify that we have correctly distinguished the causes, how many they are and what they are, since they have been unable to touch upon any other cause, and, in addition, that the starting-points must be looked for in all these ways or in some of them.[146] But as for how each of these people has spoken and how he stands concerning the starting-points, let us next, so far as is possible, go through the puzzles about these.[147]

A 8

Those thinkers, then, who posit that the universe is one and also posit a single nature as matter, and this corporeal and having magnitude, clearly err in many ways.[148] For they posit the elements of bodies alone, but [1] not of the incorporeal things, although incorporeal ones are also beings.[149] And when they try to state the causes of coming to be and passing away and to give a physical account of all things, [2] they do away with the cause of movement.[150] Further, they err by [3] not positing the substance (that is, the what-it-is) as a cause of anything, and in addition [4] by too readily speaking of any of the simple bodies except earth as the starting-point, without investigating the way these things come to be from each other—I mean, fire, water, earth, and air. For some come to be from each other by aggregation and others by disaggregation, and with respect to priority and posteriority this makes a great difference. For in one way the most elemental thing of all would seem to be the primary one from which they come to be by aggregation, and this would be the most fine-grained of the bodies and the one having the smallest parts.

That is why those who posit fire as starting-point would most of all be speaking in agreement with this account. But each of the others also agrees that the element of the bodies is a thing of this sort. At any rate, none of those who say that it is one thought that earth is the element, clearly because of the largeness of its parts, whereas of the three [other candidate] elements each has found some judge in its favor, for some say that it is fire, others that it is water, others that it is air.[151] And yet why don't they also say earth, as ordinary men do?[152] For these say that all things are earth, and Hesiod too says that earth was the first of the

bodies to come to be (thus it turns out that the supposition is ancient as well as popular).[153] So according to this account if someone said it is one of these things other than fire or posited that it is denser than air but more fine-grained than water, he would not be speaking correctly. But if what is posterior in coming to be is prior in nature, and what is concocted and aggregated is posterior in coming to be, the result would be the contrary of this, water being prior to air and earth to water.[154]

About those, then, who posit one cause of the sort we described, let so much be said. But the same would apply if someone posits that these are more than one, in the way that Empedocles says that the matter is four bodies. For he too necessarily incurs consequences, some of which are the same as before, while others are special to him.[155] For [5] we see these bodies coming to be from one another in such a way that the same body does not always remain fire or earth (we have spoken about this in our works on nature).[156] Also, about the cause of movement, whether we must posit one or two, he must be thought to have spoken neither correctly nor altogether reasonably.[157] Generally, too, those who speak this way necessarily do away with alteration, since cold will not come from hot or hot from cold.[158] For if it did, there would be something that received these very contraries, and there would be some one nature that became fire and water, which this thinker does not say.

If we were to take Anaxagoras to say that there are two elements, what we took him to say would be most in accord with an account that he himself did not articulate, although he would necessarily have had to follow those who do advance it.[159] For to say that at the start all things had been mixed is both strange on other grounds and because it follows that they must have been unmixed before the start, and because a random thing cannot naturally be mixed with a random thing, and in addition because attributes—even [intrinsic] coincidents—would be separated from substances (since of the same things as there is mixture there is also separation).[160]

Nonetheless, if someone were to follow along with him while at the same time helping to articulate distinctly what he wishes to say, he would presumably appear to be speaking in a more advanced way. For when nothing was yet separated out, clearly nothing could be truly said of the substance that was there. I mean, for example, that it was neither white nor black nor gray nor any other color, but of necessity colorless, since otherwise it would have had one of these colors. And similarly it was flavorless, by this same argument, and had not a single one of the similar attributes, since it could have neither some quality

nor some quantity nor some what.[161] For otherwise one of the particular forms would have belonged to it (and this is impossible, because all were mixed together), since it would have already been separated out (and he says that all things were mixed except understanding, which was alone unmixed and pure).[162] From this, then, it follows that he must say that the starting-points are the one (for this is simple and unmixed) and the other, which is such as we posited the indefinite to be, before it is given definition and participates in some form.[163] And so, while he speaks neither correctly nor perspicuously, he means something like what later thinkers were saying and now appears more and more to be the case.[164]

But in fact these thinkers are at home only in accounts concerning coming to be, passing away, and movement, since it is pretty much only of this sort of substance that they look for the starting-points and causes. Those, however, who make their theoretical knowledge concern all beings, positing that some beings are perceptible whereas others are imperceptible, are clearly conducting an investigation of both kinds (*genos*). That is why we should spend more time seeing what they say correctly and what incorrectly in the investigation of the topics now before us.

The so-called Pythagoreans use their starting-points and elements in a stranger way than the physicists.[165] This is because they did not take these from perceptibles (for mathematical beings are without movement, except for those with which astronomy is concerned).[166] Yet all their discussions and the topics they busied themselves with were concerned with nature. For they generate the heaven, and, where its parts, attributes, and workings are concerned, they closely observe the things that happen, and they use up their starting-points and their causes on these, as if agreeing with the various physicists that being is just this, namely, what is perceptible and is embraced by the so-called heaven.[167] But the causes and starting-points they mention are, as we said, adequate to go up even to higher beings, and are more fitted to these than to accounts concerned with nature.[168] About what way there can be movement, however, if limited and unlimited and odd and even are the only things assumed, they have nothing to say, or about how it is possible without movement and change for there to be coming to be and passing away or the workings of the bodies that are moved throughout the heaven.[169]

Further, if either we granted them that spatial magnitude consists of these elements or that this were shown, still in what way would some bodies be light and others have weight? For, based on what they assume and say, they are speaking no more about mathematical bodies

than about perceptible ones.[170] And the reason why they have said nothing whatever about fire, earth, or the other bodies of this sort is precisely, I think, because they have nothing special to say about perceptible bodies.

Further, how should we take the attributes of number and number itself to be causes of the things that are and that come to be in the heaven both at the start and now, when there is no other number besides this number for the cosmos to be composed of? For when they say that belief and appropriate time are found in such-and-such a part of the cosmos, and injustice and disaggregation or mixture a little above or below, and say that a demonstration of this is that each of these is a number, but there happens to already be a plurality of composed magnitudes in the relevant place, because these attributes follow along with the corresponding places, is this the same [sort of] number, the one in the heaven, that we must take each of these things to be, or is it another [sort] than this?[171] For Plato says it is another. Although he too thinks that both these things and their causes are numbers, but that the intelligible numbers are causes, whereas the other ones are perceptible.[172]

A 9

Let us leave aside the views of the Pythagoreans now, since it is enough that we have latched on to them to this extent. As for those who posited the Ideas, first, [1a] in looking to find the causes of the beings that exist here, they introduced others, equal in number to these—as if a person who wished to count the beings were to think that he would not be able to do it while there were so few of them, and so tried to count them by making more.[173] For the Forms are pretty much equal in number to—or no fewer than—the things whose causes they were inquiring into, in proceeding from them to the Forms.[174] For [1b] in each case there is something that has the same name, both among the other things of which there is a one over many and beyond the substances, both over the things that exist here and over the eternal things.[175]

Further, of the ways in which we show that there are Forms none makes these evident.[176] [2] For from some of these ways no deduction is necessarily generated, whereas from some Forms are also generated of things of which we think there are no Forms.[177] For, [2a] according to the arguments from the sciences, there will be Forms of all things of which there are sciences, and [2b] according to "the one over many" there will be Forms even of negations, whereas [2c] according to the

argument that there is understanding of a thing that has passed away there will be Forms of things that pass away, since there is an appearance of them.[178]

Further, of the more exact of the arguments, [3a] some produce Ideas of relatives, of which we say there is not an intrinsic kind (*genos*), whereas [3b] others introduce the *Third Man*.[179]

[4] And in general the arguments for the Forms do away with the things whose existence we, as people who speak of Forms, prefer to the existence of the Ideas, since it follows [4a] that it is not the dyad that is primary but number, [4b] and that the relative is prior to the intrinsic, as well as all the other things that certain people, by following out the beliefs held about the Ideas, have accepted contrary to the starting-points.[180]

Further, [5a] by the supposition according to which we say that there are Ideas, there will be Ideas not only of substances but also of many other things (for [2c] the intelligible object is a one not only where substances are concerned but also in the case of the other things, and [2a] there are sciences not only of substance but also of the other things, and countless other such difficulties arise).[181] On the other hand, [5b] in accord with the necessities of the case and with the beliefs held about them, if the Forms are to be participated in, there must be Ideas of substances only, for they are not participated in coincidentally but rather a thing must participate in each in this way, namely, insofar as it is not said of an underlying subject (I mean, for example, if something participates in double-itself, it also participates in the eternal, but does so coincidentally, since it is coincidental to the double that it is eternal), so that the Forms will be substance.[182] [6] But it is the same things that signify substance here as over there—or what will it mean to say that there is something beyond these things here, the one over the many?[183] And if the Ideas and what participate in them are the same in form, there will be something common to these. For why should the two be one and the same in the case of the twos that pass away, and in those that are many but eternal, rather than in the case of [two-] itself and some particular [two]? But if they are not the same in form, they would be homonymous, just as if someone were to call Callias and a wooden statue a man, seeing nothing communal between them.[184]

Above all, though, we might go through the puzzles about what on earth the Forms contribute to perceptibles, either to those that are eternal or to those that come to be and pass away, since [7] they are not the cause of movement or of any change whatsoever in them.[185] [8] But then they are also no help at all either as regards the scientific

knowledge of the other things, since they are not their substance (otherwise they would be in them) or [9] in relation to their being, if they are not components of the things that participate in them.[186] For if they were, they might perhaps seem to be causes in the way that what is white is a cause when mixed with a white thing. But this account is all too readily upset—it is one that first Anaxagoras and later Eudoxus and certain others stated.[187] For it is easy to collect many impossibilities against a belief of this sort.[188]

[10] But then neither is it possible to say, in any of the familiar ways of speaking, that the other things come *from* the Forms.[189] To say that they are paradigms and that the other things participate in them is to utter empty words and speak poetic metaphors. For what is it that makes things by looking to the Ideas? It is possible for anything both to be like and become like another thing without being copied from it, so that whether Socrates exists or not, someone could become like him. And the same would clearly hold even if Socrates were eternal. [11] Also, there will be more than one paradigm of the same thing and so more than one Form—for example, the Forms of man will be animal and two-footed, as at the same time will be man-itself.[190] [12] Further, the Forms will be paradigms not only of the perceptibles but also of themselves—for example, the genus, as genus of several species. And so the same thing will be paradigm and copy.[191]

[13] Further, it would seem to be impossible for the substance and that of which it is the substance to be separate.[192] And so how could the Ideas, if they are substances of things, be separate from them?

[14] In the *Phaedo*, however, it is said as follows: the Forms are causes both of the being and of the coming to be of things.[193] But even if the Forms do exist, the things that participate in them would still not come to be unless there was a moving cause. Also, many other things come to be—for example, a house or a ring—of which [2a] we say there are no Forms. And so it is clear that it is also possible for the others to be and to come to be through the same causes as the things we mentioned just now.

[15] Further, if indeed the Forms are numbers, in what way will they be causes?[194] Is it because the beings are other numbers—for example, this number here man, this one here Socrates, and this one here Callias? If so, why are the one lot the cause of the other lot? For even if the one lot are eternal and the other not, it will make no difference. If, on the other hand, the things that exist here are ratios of numbers (for example, a musical concord), it is clear that there is at least one thing of which they are the ratios.[195] If, then, this thing—the matter—is something definite, it is evident that the numbers themselves will also

be some ratios of something to something else.[196] I mean, for example, that if Callias is a ratio, expressible in numbers, of fire, earth, water, and air, it is also of certain other underlying things that his Idea too will be a number. And man-itself, whether it is some sort of number or not, will nonetheless be a ratio, expressible in numbers, of certain things and not a number, and nor, because of this [argument], will any Idea be a number.

[16] Further, one number may come to be from many numbers, but how can one Form come from many Forms?[197] And if it does not come from them themselves but from the things that are in a number (for example, in the myriad), how will it be with the units?[198] For if they are of the same form, many strange things follow, as they also do if they are not of the same form (whether the one lot as each other or all the lots as all the others).[199] For in which way will they differ, being without attributes? For these results are neither reasonable nor consistent with our understanding [of units].

[17] Further, they will have to introduce some other kind (*genos*) of number (with which arithmetic is concerned), as well as all the things called "intermediates" by some thinkers.[200] And how are these to exist and from what starting-points? Or why will they be intermediate between the things we find here and the things themselves?[201]

[18] Further, each of the units in the two comes from some prior two, but this is impossible.[202]

[19] Further, why is number, when taken all together, one?[203] **992ª1**

[20] Further, in addition to what has been said, if indeed the units are different, Platonists should have spoken like those who say that the elements are four, or two (for each of those says not that what is common—for example, body—is an element but rather fire and earth, whether [they think] there is something common to them—body—or not), but in fact they speak as if the one were homoeomerous like fire or water.[204] If this is so, however, the numbers will not be substances, rather it is clear that—if indeed there is some one-itself and it is a starting-point—things are said to be one in various ways.[205] That would be impossible otherwise.

[21] When we wish to refer back substances to their starting-points we posit that lines come from the short and the long (that is, from a certain sort of small and great), plane from broad and narrow, and solid from deep and shallow, yet how, then, will either a surface have a line or a solid have a line and a surface?[206] For the broad and narrow is a kind (*genos*) distinct from deep and shallow. So, just as number is not present in these, because the many and few is distinct from them, it is clear that none of the higher ones will be present in the lower ones.

But then again the broad is not a kind (*genos*) of the deep either, since, then, a body would be a certain sort of plane.

[22] Further, as to the points, from what will their presence in lines come?[207] In fact, Plato used even to contest this kind (*genos*) as being a geometrical dogma. Instead, he called it "[the] starting-point of line," and often posited that it consisted of indivisible lines.[208] And yet these lines must have some limit, so that from the account on the basis of which a line exists, a point also exists.

[23] In general, though wisdom inquires into the cause of perceptible things, we left this alone (for we say nothing about the cause from which change starts), and—thinking that we are stating the substance of these things—we say that they are yet other substances, but as for the way in which these are substances of those, we state it through empty words.[209] For "participation," as we said earlier, means nothing.[210]

[24] As, then, for the very thing we see to be *the* cause for the sciences, the one because of which every understanding and every nature does things, the Forms in no way latch on to this cause either, which we say is one of the starting-points, instead mathematics has become philosophy for the present thinkers, although they say that we should busy ourselves with it for the sake of something else.[211]

992ᵇ1 [25] Further, the substance that is the underlying subject as matter we might take to be too mathematical, and to be more a predicate and a differentia of the substance and of the matter than matter proper—for example, the great and the small are like the rare and the dense that the physicists also speak about, calling these the primary differentiae of the underlying subject, since they are a sort of excess and deficiency.[212]

[26] And as for movement, if these things constitute movement, it is clear that the Forms will move. But if not, where does movement come from?[213] For the whole investigation concerning nature has been done away with.

[27] And what seems to be easy, namely, to show that all things are one, does not come about.[214] For by *ekthesis* it does not come about that all things are one, but—if we grant all [their assumptions]—that there is some one-itself, and not even that, if we do not grant that the universal is a genus, which in some cases is impossible.[215]

[28] And there is no account of the lengths, surfaces, and volumes that come after the numbers, either of the way they are or will be or of what capacity they have.[216] For these things cannot be Forms (since they are not numbers), or intermediates (since those are the objects of mathematics), or things that pass away, but appear to constitute another fourth kind (*genos*).

[29] In general, to look for the elements of beings without making distinctions, when they are said [to be] in many ways, makes it impossible to find them, and especially if one looks in this way for the sorts of elements they come from. For from what elements will doing or undergoing or straightness come?[217] Surely, it is not possible to get hold of these, but if indeed it is possible, it is only of the elements of substances. And so either to look for the elements of all beings or to think that we have found them is incorrect.[218]

[30] And how could we even learn the elements of all things? For clearly we cannot start by already knowing something that is prior to them. For just as a person who is learning geometry, though he may have prior knowledge of other things, has no prior knowledge of the things of which geometry is the science and about which he is trying to learn, so it is too, then, in the case of the other sciences, so that if there is a science of all things, of the sort some people say there is, a person who is to learn it should start by knowing nothing whatsoever. Yet all learning takes place through things of which there is prior knowledge, either of all of them or of some of them, that is, either [a] through demonstrations or definitions (for we must have prior knowledge of the things from which the definition comes and they must be well-known), and similarly too [b] in the case of learning through induction.[219] But then again if such knowledge were in fact innate, we might wonder *how* we could possess the most excellent of the sciences without being aware of it.[220]

[31] Further, how could we come to know the things from which it comes, and how is this to be made clear?[221] There is a puzzle about this too. For there might be a dispute about it, just as there is about certain voiced syllables. For some people say that ZA comes from S, D, and A, whereas others say that it is another sound, and not any of the well-known ones.[222]

[32] Further, as to the things of which there is perception, how could someone come to know them without having the relevant perception?[223] And yet he would have to, if in fact these are the elements from which all things come, just as complex sounds come from the elements that properly belong to them.

A 10

It is clear even from what we previously said that all thinkers seem to have been inquiring into the causes that we mentioned in the *Physics*, and that we cannot mention any outside these. But [they touched upon] these vaguely, and so in a way they have all been discussed before, and in a way they have not been discussed at all. For early philosophy

concerning all things seemed to speak inarticulately, because it was young and at the starting-point, since even Empedocles says that bone exists as a result of its ratio, and this is the essence and the substance of the thing.[224] But then it is similarly necessary that flesh and each of the others should be its ratio, or that not one of them should. Hence it is because of this that both flesh and bone and everything else will exist, and not because of the matter, which *he* mentions—fire, earth, water, and air. But whereas if someone else had said this, he would necessarily have agreed, he has not said it in a perspicuous way.[225]

Well, about these things we have also made our views clear earlier. But let us go back again to whatever we might puzzle over concerning these very things. For maybe from these we might achieve something of a puzzle-free condition in connection with the later puzzles.[226]

Book Little Alpha (II)[227]

α 1

Theoretical knowledge concerning the truth is in one way difficult to get and in another way easy. An indication of this is that while none is capable of hitting upon it in the way it deserves, neither do all completely fail to hit it, but rather each has something to say about the nature of things, and whereas taken individually they contribute little or nothing to it, a gathering together of all results is a contribution of some magnitude. So if indeed the truth is like the proverbial barn door that none can miss, in this way it would be easy, but the fact that we can have some grasp on the whole while being incapable of grasping the part makes clear how difficult it is.[228]

Presumably too, since difficulties occur in two ways, it is not in the things but in us that the cause of this one lies. For as the eyes of bats are to the light of day so is the understanding in our souls to the things that are by nature most evident of all.[229]

It is a just thing, however, to be grateful not only to those whose beliefs we share, but also to those who have expressed more superficial views. For they have also contributed something, since they prepared the state [of the subject] for us. For if there had been no Timotheus, there would be much lyric poetry that we would not possess, but if there had been no Phrynis, there would have been no Timotheus.[230] It is the same way too with those who have expressed views about the truth, since from some thinkers we have received certain beliefs, whereas others caused these thinkers to become what they were.

It is also correct for philosophy to be called scientific knowledge of the truth. For of theoretical science the end is truth, whereas of practical science it is function (since, whenever practical people investigate the how of things, what they get a theoretical grasp on is the cause not intrinsically but in relation to something and now).[231] But we do not know the truth without its cause. Now, each [attribute] belongs most of all to something when it is because of it that a synonymous attribute also belongs to other things (for example, fire is the most hot thing, since it is the cause of heat in other things).[232] And so what is also most true is what causes all derivative things to be true. That is why the starting-points of the eternal beings must be most true (for they are not *sometimes* true, nor is there any cause of their being, instead they

30 **993^{b}1** 5 10 15 20 25

30 themselves are a cause for the others), so that as each thing is as regards being, so it is too as regards truth.[233]

α 2

But that there *is* some starting-point—that is, that the causes of beings
994ª1 are neither [1] an unlimited series nor [2] unlimited in kind (*eidos*)—is clear. [1] For neither is it possible for one thing to come from (*ek*) another as matter without limit (for example, flesh from earth, earth from air, air from fire, and so on without stopping), nor is it possible for the starting-point from which the movement comes to be such (for
5 example, for a human to be moved by air, air by sun, sun by strife, and so on without limit). Similarly, the for-the-sake-of-which cannot go on without limit either (for example, walking for the sake of health, this for the sake of happiness, and happiness for the sake of something else, and so one thing always being for the sake of another), and in the case
10 of the essence it is the same way.

For of medial things [in a series], since there is a last one and a prior one, the prior one must be the cause of the things that come after it. For if we had to say which of the three was the cause, we would say the first. For it is certainly not the *last*, since the final one causes nothing. But then it is not the medial one either, for it is the cause
15 of only one thing (and it makes no difference whether there is one medial thing or more than one, nor whether they are unlimited or limited in number). But of series that are unlimited in this way, and of what is unlimited generally, all the parts are alike medial things down to now, so that if indeed there is no first one, there is no cause at all.[234]

But the series cannot go downward in this way without limit
20 either, namely, with a starting-point above, so that from fire comes water, from water earth, and in this way some other kind (*genos*) of thing is always coming to be. For one thing comes from (*ek*) another in two ways (apart from the one in which *ek* means "after," as in "the Olympic games come *ek* the Isthmian"), either [a] the way in which a man comes from a child by the child's changing or [b] the way in which air comes from fire. [a] Now a man is said to come from a child
25 in the way that what has come to be comes from what is coming to be, or as the completed thing comes from the thing that is being completed—for there is always an intermediate, so that as between being and not being there is coming to be, so too the thing that is coming to be is between the thing that is and the thing that is not, for the person who is learning is coming to be someone with scientific knowledge,

and this is what we mean when we say that from someone who is learning comes someone with scientific knowledge. [b] On the other hand, when something comes from another thing in the way that water comes from air, the other thing ceases to be. This is why [a] the former sort is not reversible, and a child does not come from a man (for it is not what comes to be *something* that comes to be as a result of coming to be but what exists after the coming to be [is complete], and it is in this way too that the day comes from the morning, because it comes after the morning, which is why the morning does not come from the day).[235] But [b] the other sort is reversible.[236] In both, however, it is impossible for them to go on without limit. For in [a] the former sort the intermediates must have an end, and in [b] the latter the change is reversible, since the passing away of either is the coming to be of the other.

994ᵇ1

At the same time, however, it is also impossible that the first [cause], since it is eternal, should pass away. For since coming to be is not without a limit in the upward direction, [a] the first thing from (*ek*) whose passing away something came to be must be non-eternal.[237]

And since the for-the-sake-of-which is an end, and the sort of end that is not for the sake of other things but rather other things are for its sake, it follows that if there is to be a last thing of this sort, the series will not be without a limit, but if there is no such thing, there will be no for-the-sake-of-which. Those who make it unlimited are unwittingly getting rid of the nature of the good (and yet no one would try to do anything if he were not going to come to a limit). Nor would there be any understanding present in beings. For someone who has understanding, at any rate, always does the actions he does for the sake of something, and this is a limit, since the end is a limit.[238]

But then neither can the essence be referred back to another definition that is fuller in account, since it is always the one that comes before that is more a definition, and not the one that comes after, and if the first one is not a definition, neither is the last.[239] Further, those who speak that way do away with scientific knowledge, since it is impossible to have knowledge until we come to indivisibles.[240] And knowing anything is impossible. For how can there possibly be understanding of what is unlimited in this way? For it is not like the case of a line, the divisibility of which does not stop, but which we cannot understand without making a stop.[241] That is why in traversing what is unlimited we cannot count the cuts, but rather the whole line must be understood by something that does not move [from cut to cut].[242] Also, there can be nothing that is unlimited, and if that is not so, at any rate the [definition of] what is unlimited is not unlimited.[243]

[2] But then if the kinds (*eidos*) of causes *were* unlimited in number, knowledge would again be impossible. For we think we know when we know the causes, but what is unlimited by addition cannot be gone through in a limited time.[244]

α 3

Lectures, however, produce their effects in accord with people's habits, since we expect them to be spoken in the manner we are accustomed to, and anything beyond this appears not to have the same strength but to be something quite unknown and quite strange. For it is the customary that is familiar. Indeed, the extraordinary power of what we are accustomed to is clearly shown by our *customs,* where mythical and childish stories about things have greater power than our knowledge about them, because of our habits.

Now some people do not accept what someone says if it is not stated mathematically, others if it is not based on paradigm cases, while others expect to have a poet adduced as a witness. Again, some want everything expressed exactly, whereas others are annoyed by what is exact, either because they cannot string all the bits together or because they regard it as nitpicking. For exactness does have something of this quality, and so just as in business transactions so also in arguments it seems to have something unfree or ungenerous about it.[245]

That is why we should already have been well educated in what way to accept each argument, since it is absurd to look for scientific knowledge and for the way [of inquiry] characteristic of scientific knowledge at the same time—and it is not easy to get hold of either.[246] Accordingly, we should not demand the argumentative exactness of mathematics in all cases but only in the case of things that include no matter.[247] That is why the way of inquiry is not the one characteristic of natural science, since presumably every nature includes matter.[248] That is why we must first investigate what a nature is, since that way it will also be clear what natural science is concerned with, and whether it belongs to one science or to more than one to get a theoretical grasp on causes and starting-points.[249]

Book Beta (III)

B 1

It is necessary, with a view to the science we are inquiring into, first to go over topics about which we should first raise puzzles.[250] These include both topics about which people have supposed divergent things, as well as any separate from these that may have been overlooked. Now for those who wish to be puzzle-free it is useful to go through the puzzles well. For the subsequent puzzle-free condition is reached by untying the knots produced by the puzzles raised in advance, and it is not possible to untie a knot you are unaware of. But a puzzle in thought makes clear the existence of a knot in the subject matter.[251] For insofar as thought is puzzled it is like people who are tied up, since in both cases it is impossible to move forward.

That is why we must get a theoretical grasp on all the difficulties beforehand, both for these reasons and because those who inquire without first going through the puzzles are like people who do not know where they have to go. And, in addition, a person [who has not already grasped the puzzles] does not even know whether he has found what he is inquiring into.[252] For to someone like that the end is not clear, whereas to a person who has already grasped the puzzles it is clear. Further, a person is necessarily in a better position to make a judgment when—as if they were opposing parties in a court case—he has heard all the contending arguments.

[P1] The first puzzle is concerned with the topic we went through the puzzles about in our prefatory remarks, namely, whether it belongs to one science or to more than one to get a theoretical grasp on causes.[253]

[P2] And whether it is only the primary starting-points of substance that science has to look at, or whether it is also concerned with the starting-points on which everyone depends when proving things—for example, whether or not it is possible to affirm and deny one and the same thing at the same time, and other such starting-points.[254]

[P3] And if it is concerned with substance, whether there is one science concerned with all of them or more than one, and if more than one, whether they are all of the same kind (*genos*) or some of them should be called sorts of wisdom and others something else.[255]

[P4] And this itself is also one of the things that it is necessary to inquire into—whether we should say that only perceptible substances exist or also others beyond these, and [if so] whether there is one kind or several kinds (*genos*) of these substances, as is supposed by those who introduce both Forms and objects of mathematics that are intermediate between them and the perceptibles.[256]

[P5] These, then, as we say, we must investigate, and also whether the theoretical knowledge [we are investigating] is concerned only with substances or also with the intrinsic coincidents of substances.[257] In addition, concerning same and other, like and unlike, and contrariety, and concerning prior and posterior, and all the other such things that dialecticians try to investigate, making their investigation on the basis of reputable beliefs only—whose task is it to get a theoretical grasp on all these?[258] Further, [we must investigate] the intrinsic coincidents of these very things, and not only what each of them is, but also whether one thing is the contrary of one thing.[259]

[P6] Also, whether the starting-points and elements are the genera or the components present in each thing, into which it is divided.[260]

[P7] And if they are the genera, whether they are the first ones or the ultimate ones that are said of indivisible things—for example, whether animal or human is a starting-point and is to a higher degree beyond what is particular.[261]

[P8] Above all, we must inquire into, and work on, whether or not there is something, beyond the matter, that is an intrinsic cause, whether or not this is separable, whether it is one or more than one in number, and whether there is something beyond the compound (I mean by "the compound" whenever something is predicated of matter), or nothing, or whether for some there is, whereas for others there is not, and what sorts of beings these are.[262]

[P9] Further, whether the starting-points are definite in number or kind (*eidos*), both those in the accounts and those in the underlying subject.[263]

[P10] Also, whether the starting-points of what passes away and of what does not pass away are the same or distinct, and whether none of them passes away or those of things that pass away do pass away.[264]

[P11] Further, the most difficult one of all and the one involving the most puzzles—whether the one and being are not, as the Pythagoreans and Plato used to say, another thing, but rather the substance of the beings, or whether this is not so but the underlying subject is another thing, which Empedocles says is love, someone else, fire, someone else, water or air.[265]

[P12] Also, whether the starting-points are universal or like particular things.[266]

[P13] Further, whether they are [causes] potentially or actively, and further whether they are [causes] in any other way than as regards movement.[267] For these topics too cause much puzzlement.

[P14] In addition, whether or not numbers, lines, figures, and points are substances of some sort or not, and if they are substances, are they separate from the perceptible ones or components present in them?[268]

For concerning all these not only is it difficult to be in puzzle-free possession of the truth but it is not easy even to go through the puzzles well in the account.

B 2

[P1] The first, then, concerns the things we mentioned first, namely, whether it belongs to one science or to more than one to get a theoretical grasp on all the kinds (*genos*) of causes. For how could it belong to one science to know the starting-points if these are not contraries?[269]

Further, to many beings not all the starting-points pertain. For in what way can there be a starting-point of movement for immovable things?[270] Or in what way can the nature of the good be such a starting-point, if indeed everything that is good intrinsically and because of its own nature is an end and a cause in this way, namely, that for its sake the other things both come to be and are, and if the end—that is, the for-the-sake-of-which—is an end of some action, and all actions involve movement?[271] So in the case of immovable things this starting-point could not exist, nor could there be any good-itself. That is why in mathematics too nothing is shown through this cause, nor is there any demonstration where the cause is this: "because it is better or worse." Indeed no one mentions any such thing at all. And so this is why some of the Sophists—for example, Aristippus—used to shower abuse on mathematics, since in the other crafts, even manual ones like carpentry and shoemaking, the cause is always stated in terms of better or worse, whereas the mathematical sciences take no account of good and bad things.[272]

But then if there are *several* sciences of the causes, and a distinct one for each starting-point, which of them should we say is the one we are inquiring into? Or which of those who possess these sciences should we say has the highest degree of scientific knowledge of the object of our inquiry? For it is possible for all the ways of being causes to pertain to the same thing—for example, in the case of a house the source of the movement is the craft or the builder, the for-the-sake-of-which is the

function, the matter is earth and stones, and the form is the account.[273] Based on our earlier determinations about which of the sciences should be called wisdom, there is reason to apply the term to each.[274] For insofar as wisdom is most ruling and most leading, and insofar as, like with handmaidens, for the other sciences ever to contradict it is not just, it is the science of the end and of the good that is of the same sort as wisdom (for other things are for the sake of the end and the good).[275] And insofar as wisdom was determined to be about the primary causes and about what is most scientifically knowable, it is the science of substance that must be of the same sort as it.[276] For since people may scientifically know the same thing in many ways, we say that the person who knows what the object is by its being knows it better than the person who knows it by its not being, and of those who know it better some know it better than others, and the person who knows it best is the person who knows what it is, not the person who knows [merely] its quality or quantity or what it can naturally do or have happen to it. Further, in other cases, too, even those of which there are demonstrations, we think that there is knowledge of each thing when we know what it is—for example, what squaring a rectangle is, namely, that is the finding of a mean, and similarly in other cases.[277] And about comings to be and actions, and about every sort of change, we think there is knowledge when we know the starting-point of the movement; but this is distinct from and opposed to the end, so that it might seem that for each of these causes it belongs to a distinct science to get a theoretical grasp on it.

[P2] But then about the starting-points of demonstration too, and whether there is one science of them or more than one, there is dispute (by the starting-points of demonstration I mean the common beliefs on the basis of which we all prove things, such as that in every case it is necessary either to affirm or deny, and that it is impossible for something at the same time to both be and not be, and any other propositions like that), namely, about whether there is one science of these and of substance or distinct ones, and, if it is not one science, which of the two should be identified with what we are now inquiring into?[278]

Well, for there to be one science of them is not reasonable. For how is it more special to geometry than to any science whatever to comprehend them? So if indeed it belongs to every science alike to comprehend them, but cannot belong to all [as their special subject], then, just as it is not special to the others, neither is it special to the one who knows substances to know about them. At the same time, indeed, in what way can there be a science of them? For what each of them in fact is we know even now—at any rate, even the various crafts make use of

them as things that are known. But if there is a demonstrative science concerned with them, there will have to be some hypothesized genus, as well as attributes, on the one hand, and axioms pertaining to them, on the other, since it is impossible for there to be demonstrations of everything.[279] For demonstration is necessarily *on the basis of* some things, *about* a certain subject, and *of* some things. And so it follows that all provable things belong to some one genus, since all demonstrative sciences make use of the axioms.

But then if the science of substance and the science concerned with the axioms are distinct, which of them naturally has more control and is prior?[280] For it is the axioms that are most universal and the starting-points of all things, and if not to the philosopher, then to whom does it belong to get a theoretical grasp on what is true and what is false about them?[281]

[P3] And in general, where substances are concerned, is there one science of all of them or more than one? Well, if there is not just one, to what sorts of substance should we take our science to pertain? On the other hand, it is not reasonable that there should be one of all of them, since then there would be one demonstrative science of all [intrinsic] coincidents—if indeed every demonstrative science gets a theoretical grasp on the intrinsic coincidents of some underlying subject on the basis of the common beliefs.[282] In fact, to get a theoretical grasp on the intrinsic coincidents *of the same genus* on the basis of the same beliefs does belong to the same science.[283] For of *the what about* there is one science and of the *on the basis of which* there is one science too (whether the same one or a distinct one), and so the coincidents are also theoretically grasped either by these sciences or by one composed of them.[284]

[P5] Further, is the theoretical knowledge concerned with substances alone or also with their [intrinsic] coincidents?[285] I mean, for example, if the solid is a sort of substance and so are lines and planes, does it belong to the same science to know these and the [intrinsic] coincidents of each genus, of which the mathematical sciences provide proofs, or to another science?[286] If to the same one, the science of substance would also be a demonstrative science, but there does not seem to be a demonstration of the what-something-is.[287] On the other hand, if it belongs to another science, which of them is going to get a theoretical grasp on the [intrinsic] coincidents of substance? This is a very difficult question.[288]

[P4] Further, are we to say that only the perceptible substances exist, or that there are others beyond these? And is there one kind (*genos*) or are there in fact several kinds of these substances—as those say who assert the existence both of the Forms and of the intermediates, with 997b1

which they say the mathematical sciences are concerned? Now the way in which *we* say that the Forms are both causes and intrinsically substances has already been stated in our first accounts of them.[289] But while Forms involve difficulties in many places, none is stranger than to say that there are certain natures beyond those in the heaven as a whole, and that these are the same as perceptibles, except that they are eternal whereas the latter pass away.[290] For they say that there is man-itself and horse-itself and health-itself, and nothing else—like those who introduce gods, but say that they are human in form.[291] For those people were making the gods nothing but eternal human beings, and these are making the Forms nothing but eternal perceptibles.

Further, if beyond the Forms and the perceptibles someone is going to posit the intermediates, he will face many puzzles. For it is clear that there will be lines beyond the lines-themselves and the perceptible lines, and similarly with each of the other kinds (*genos*). So if indeed astronomy is one of the mathematical sciences, there will also be a heaven beyond the perceptible heaven, as well as a sun and a moon, and similarly with the other bodies throughout the heaven.[292] And yet how are we supposed to believe these things?[293] For a thing of that sort to be immovable is not reasonable, but for it to be moving is altogether impossible. Similarly too for the things that optics busies itself with and those in harmonics, since it is impossible—due to the same causes—for them to be beyond the perceptibles.[294] For if there are intermediate perceptibles and perceptions, it is clear that there will also be animals that are intermediate between the animals themselves and the ones that pass away.[295]

But someone might also raise this puzzle: with reference to which sorts of beings are we supposed to look for these sciences [of intermediates]? For if geometry is to differ from measurement only in this respect, that measurement is of things we perceive, whereas geometry is not, it is clear that there will also be a science beyond medicine (and beyond each of the others), intermediate between medicine-itself and the medicine for the things that exist here.[296] And yet how is this possible? For there would also have to be healthy things beyond the perceptible ones and the healthy-itself. At the same time, though, not even this is true, namely, that measurement is of perceptible magnitudes that pass away, since it would then pass away when they did.[297]

But then [geometry] would not be concerned with perceptibles, nor would astronomy be concerned with the heaven that is here. For perceptible lines are not the way a geometer says lines are—for no perceptible thing is straight or round in the way he says they are,

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since a circular hoop makes contact with a ruler not at a point but as Protagoras used to say it did when refuting the geometers—nor are the movements and spirals of the heaven like those about which astronomy produces its accounts, nor do points have the same nature as stars.[298]

There are some, however, who say that these so-called intermediates between the Forms and the perceptibles exist, although not *separate* from perceptibles but rather in them.[299] To go through all the impossible consequences of these views would require too long an account. It is enough to get a theoretical grasp even on the following ones: It is not reasonable, after all, that this should hold only of the intermediates, rather, it is clear that the Forms too might exist in the perceptibles, since the same argument applies to both of them. Further, it follows that two solid things are necessarily in the same place, and that [the intermediates] are not immovable, since they at any rate are *in* things that are moving—namely, perceptibles. And in general, for the sake of what would someone posit that they exist but that they exist in perceptibles? For the same strange consequences will follow that we have already mentioned, namely, there will be a heaven beyond the heaven, only not separate from it but rather in the same place—which is just what is even more impossible.

B 3

[P6] Where these issues are concerned, then, there is much puzzlement both about the way we should put things in order to hit on the truth, and about the starting-points, namely, whether it is the genera that we should take to be elements and starting-points or, rather, the primary components present in each thing.[300] For example, the elements and starting-points of voiced sound seem to be those primary things from which voiced sounds are composed, not the common [genus]—voiced sound.[301] And we speak of the elements of diagrams as those things whose demonstrations are present in the demonstrations of the other things, either of all of them or of most.[302] Further, both those who say that there are several elements of bodies and those who say that there is one speak of the things from which a body is composed as starting-points. For example, Empedocles says that fire, water, and the ones that come after these are elements present in beings from which these beings are composed, but does not speak of these as genera of beings. In addition to this, if we also want to examine the nature of other things (for example, a bed), when we know the parts from which it is composed and the way they are put together, then we know its

nature. On the basis of these arguments, then, the genera would not be the starting-points of beings.

On the other hand, insofar as we know each thing through definitions, and the genera are the starting-points of definitions, then the genera must also be the starting-points of the definable things.[303] And if to get scientific knowledge of beings is to get it of the species (*eidos*) in accord with which beings are said [to be what they are], the genera are starting-points at any rate of the species.[304] And some even of those who speak of *the one* or *being* or the great and small as elements of beings apparently treat them as genera.

But then neither is it possible to speak of the starting-points in *both* ways. For the account of the substance is one, whereas the definition by means of genera will be distinct from the definition that states the components present in a thing.[305]

[P7] In addition to this, even if it is the genera that are to the highest degree starting-points, is it the primary genera that we should acknowledge as starting-points or the ultimate ones, which are predicated of the indivisibles?[306] For this too admits of dispute. For if the universal ones are always to a higher degree starting-points, it is evident that the highest of the genera [will be to the highest degree starting-points], since they are said of all things. There will then be as many starting-points of beings as there are primary genera, and so being and the one will be starting-points and substances, since these are to the highest degree said of all beings.[307] But it is not possible that either the one or being should be a single genus of beings. For the differentiae of each genus must each both be and be one, but it is impossible either for the species of the genus to be predicated of their own proper differentiae or for the genus to be predicated without its species.[308] So if indeed the one is a genus or if being is, no differentia will either have being or be one. But then if they are not genera, neither will they be starting-points, if indeed the genera are the starting-points.

Further, the intermediate ones, taken together with the differentiae, will also be genera, down to the indivisible ones, but as things stand some seem to be genera and others do not.[309] In addition to this, the differentiae will be starting-points to a still higher degree than the genera.[310] But if these too are starting-points, then the starting-points become (one might almost say) unlimited in number, especially if we take the primary genus as a starting-point. But then, if the one is, at any rate, to a higher degree the kind (*eidos*) of thing to be a starting-point, and what is indivisible is one thing, and everything that is indivisible is so either in quantity or in species, and what is so in species is prior, and

the genera are divided into species, then the ultimate genus predicated of a thing would be to a higher degree one (for the human is not the *genus* of particular humans).[311]

Further, in the case of things among which there is priority and posteriority, what is over them cannot be something beyond them.[312] For example, if two is the first of the numbers, no number will exist beyond the species of numbers.[313] Nor, similarly, will there be a [geometrical] figure beyond the species of figures. But if not of these things, there will hardly be genera beyond the species of other ones, since of these above all there seem to be genera.[314] (But among the indivisibles, one is not prior and another posterior.[315]) Further, where one thing is better and another worse, the better is always prior, so that of these also there would not be a genus.[316]

On the basis of these considerations, then, the ones predicated of indivisibles appear to be starting-points rather than the [primary] genera. But again, in what way we should take these to be starting-points is not easy to say.[317] For the starting-point, or the cause, must exist beyond the things of which it is a starting-point and must be capable of existing as separated from them.[318] But why should we take any such thing to exist beyond the particular things, besides the fact that it is predicated universally and of all of them? But again if is because of *that*, then we should posit that the more universal ones are starting-points to a higher degree, and so the primary genera would be starting-points.

B 4

[P8] Connected with these there is a puzzle, most difficult of all and most necessary to get a theoretical grasp on, to which our account now turns.[319] For if nothing exists beyond the particular things, and the particular things are unlimited in number, how is it possible to get scientific knowledge of unlimited many things? For it is insofar as they are one and the same thing, and insofar as something universal belongs to them, that we know all things.

But then, if this is necessary, and there must exist something beyond the particulars, it will be necessary that the genera exist beyond the particulars—either the ultimate genera or the primary ones. But we just went through a puzzle concerning the impossibility of this.[320] Further, if something exists most of all beyond the compound (I mean by "compound" whenever something is predicated of the matter)—if it exists, is it beyond all of them [that is, all the compound things] that it must exist, or beyond some but not others, or beyond none?

999[b]1 Now if nothing exists beyond the particular things, there will be nothing intelligible, but all will be perceptible, and there will be no scientific knowledge of anything, unless someone says that perception is scientific knowledge.[321] Further, nothing will be either eternal or immovable, since all perceptibles pass away and are in movement. But then, if *nothing* is eternal, neither is it possible for anything to be coming to be. For there must be something that comes to be and something from which it comes to be, and of these the last one cannot have come to be, if indeed there is a stopping point and if coming to be from not being is impossible. Further, if coming to be and movement exist, there must also be a limit. For no movement is unlimited, but every one has an end, and what cannot *come* to be cannot be *coming* to be, and what *has* come to be must *be* at the first moment it has come to be. Further, if indeed the matter exists because it cannot have come to be, it is yet much more reasonable that the substance—the thing that matter is coming to be—should exist. For if neither the substance nor the matter is to exist, nothing at all will exist.[322] And if that is impossible, something must exist beyond the compound, namely, the shape—that is, the form.

Again, though, if we are to posit this, there is a puzzle, namely, in which cases are we to do so and in which not? For that we cannot do so in all cases is evident, since we could not posit a house that is beyond the particular houses. In addition to this, will the substance of all things be one—for example, of all men? But that would be strange, since all those things are one of which the substance is one.[323] But are they many and different? But this too is unreasonable.[324] At the same time, in what way does the matter come to be each of these things, and in what way is the compound both these things?[325]

[P9] Further, where the starting-points are concerned, we might also raise this puzzle. If they are one in form [only], nothing will be one in number, not even the one-itself and being.[326] And how will there be scientific knowing, if there does not exist something that is a one over all?[327]

But then, if they are one in number, that is, if each of the starting-points is one, and not, as in the case of perceptibles, different for different perceptibles (for example, the starting-points of this syllable, which is the same in form [as that], are also the same in form and [not in number], since they belong to syllables that are distinct in number)—if they are not one in the latter way, but instead the starting-points of beings are one in number, nothing else will exist beyond the elements (for whether we say "one in number" or "particular" makes no difference, since by "particular" we mean "one in number," and by "universal" we mean "what is over particulars"). So it is just like this:
1000[a]1 if the elements of voiced sound were definite in number, it would be

necessary for all of literature to amount to the number of these elements, since there could not be two or more of the same ones.[328]

[P10] No less a puzzle than any has been passed over both by people now and by previous ones, namely, whether the starting-points of things that can pass away and things that cannot pass away are the same or distinct. For if they are the same, how is it that some things can pass away, whereas others cannot pass away, and due to what cause?[329]

Now the followers of Hesiod and all the theologians thought only of what was persuasive to themselves, but had contempt for people like us. For they made the starting-points to be gods and what is born from gods, and say that those who did not taste nectar or ambrosia became mortal, clearly using terms familiar to themselves. Although about the very *ingestion* of these causes they have spoken over our heads. For if it is for the sake of pleasure that the gods touch these, then nectar and ambrosia are in no way the causes of their being; but if these *are* the causes of their being, how could the gods be eternal, since they need nourishment?[330]

Where mythical subtleties are concerned, to be sure, a serious investigation is not worthwhile, but we should cross-question those who use the language of demonstration to learn from them why in the world from the same things come, on the one hand, beings that are eternal in nature and, on the other, beings that pass away. But since they neither mention a cause nor is it reasonable that things should be this way, it is clear that the starting-points and causes of these things cannot be the same. For even the very person we might think to speak most consistently, namely, Empedocles—even he suffers from the same deficiency. For he posits a starting-point, strife, as a cause of passing away, but this would seem to be no less a cause of coming to be [for everything] apart from the one, since from strife come all the other things except the god. At any rate, he says:

> From which all things—those that were, those that are, those that will be hereafter—
> Trees, and men and women, took their growth,
> and beasts and birds and water-nourished fish,
> and long-aged gods.[331]

But quite apart from these lines it is clear. For if strife had not been present in things, all things would have been one, as he says. For whenever these come together, "strife was taking a stand at the lastmost place."[332] That is also why it follows for him that the happiest god is less wise **1000ᵇ1**

than the others, since he does not know all things. For he does not have strife [in him], and knowledge is of like by like. "For by earth," he says,

> we see earth, by water, water,
> By ether, divine ether,
> By love (*storgê*) love, and strife by baneful strife.[333]

But—and this is the place from which our account began—this at least is evident, that it follows for him that strife is no more the cause of passing away than of being, nor love (*philotês*) likewise the cause of being, since by bringing the other things together into the one it causes them to pass away. And at the same time he says nothing about the cause of the changeover itself, except that it is naturally that way:

> But when great strife was nourished in the limbs [of the sphere],
> He leaped up to claim his office as the time was fulfilled,
> Which had been fixed for their exchange by a broad strong oath,[334]

as if it were necessary for there to be a changeover. But he makes no cause of the necessity clear. Nonetheless, thus far at least he alone does speak consistently. For he does not make some beings capable of passing away and others incapable of passing away, but makes all of them capable of passing away, except the elements. But the puzzle we are now talking about is why one lot is one way and the other the other, if indeed they come from the same starting-points.

So as regards the fact that the starting-points [of the two] cannot be the same, let that much be said. But if there are distinct starting-points, one puzzle is whether these too will be incapable of passing away or capable of passing away. For if they can pass away, it is clearly necessary for these also to come from certain things, since all things that pass away do so into the things they come from. And so it follows that other starting-points are prior to *the* starting-points. But this is impossible, both if the series comes to a stop and if it goes on without limit. Further, what way will things that can pass away be, if their starting-points are to be done away with? On the other hand, if the starting-points cannot pass away, due to what will things that *can* pass away come from *these* things that cannot pass away, whereas from the other ones it is things that *cannot* pass away? For this is not reasonable—on the contrary, either it is impossible or it would require much argument. Further, no one has even tried to posit other starting-points [for the two sorts of things], instead, they say that the starting-points

of all things are the same. But they sidestep the first puzzle as if they took it to be something trivial. **1001ᵃ1**

[P11] Of all of the puzzles, however, the one that is most difficult even to get a theoretical grasp on, and the one most necessary for knowledge of the truth, is whether being and the one are really substances of beings, and whether each of them is—not by being another thing—one and being respectively, or whether we must inquire into what being really is and what the one really is on the supposition that some other nature underlies them as subject.[335] For some people think their nature is of the former sort, others of the latter sort. For Plato and the Pythagoreans think that neither being nor the one is another thing, but that *this* is what the nature of each of them is, on the supposition that the substance of it is to be one or to be being.[336] Those concerned with nature, however, [take the latter view]. For example, Empedocles—supposing that he was leading it back to something more familiar—says what the one is. For he would seem to say that love (*philia*) is something of this sort. At any rate, this is for all things the cause of their being one. But other people say that fire, and others that air, is the one and the being in question, from which beings are and have come to be. Those who posit a plurality of elements also hold the same view, since they too must say that the one and being are precisely as many as the starting-points that they say exist.

However, if we do not posit the one and being to be some sort of substance, it follows that none of the other universals exists either, since these are the most universal of all. And if there is not some one-itself and being-itself, there would scarcely be any others that are beyond the so-called particulars. Further, if the one is not substance, it is clear that number would not exist either as a nature separated from the beings. For number is composed of units, and the unit is just what a certain sort of one is. But if there exists some one-itself and being-itself, then one and being must be their substance, since it is not another thing that is predicated of them, but these themselves.

But then if there *is* to be some being-itself and one-itself, there is much puzzlement as to how anything else will exist beyond these—I mean, as to how beings will be more than one. For what is other than being *is not*, and so, according to Parmenides' argument, it necessarily follows that all beings are one, and this one is being. Either way, it is difficult. For whether the one is not substance or whether there is some one-itself, number cannot be substance. We said earlier why this holds if the one is not substance, but if it is substance, the puzzle is the same as that concerning being.[337] For from what, beyond the one-itself, will **1001ᵇ1**

there be another one? Indeed, it must be not-one. But all beings are either one or a many of which each is one.

Further, if the one-itself is indivisible, according to Zeno's axiom it would be nothing.[338] For what neither makes larger when added nor smaller when subtracted, he says, has no being—on the supposition, clearly, that a being is a magnitude, and that if it is a magnitude, it is corporeal. For body has being in every [dimension], whereas other things—for example, a plane and a line—will make something larger when added in one way, but when added in another way will not do so, but a point and a unit in no way make something larger. But since he gets a theoretical grasp on the matter in a crude way, and it is possible for something indivisible to exist, against him too there is some defense, since something indivisible will not make a larger magnitude by being added, but will make a larger number—still, *how* from a one of the relevant sort, or from several such ones, will a magnitude come? For it is like saying that a line comes from points.

But then, even if we suppose the case to be such that, as some people say, number comes from the one-itself and from something else that is not one, nonetheless we must inquire into why and how what comes to be is sometimes a number and sometimes a magnitude, if indeed the not-one in question was the unequal and was the same nature [in both instances]. For it is clear that there is no way in which magnitudes could come to be from one and this nature, or from some number and this nature.

B 5

[P14] Following these issues is a puzzle as to whether numbers, bodies, planes, and points are substances or not.[339] For if they are not, then it escapes us what being is and what the substances of beings are. For attributes, movements, relatives, dispositions, and ratios do not seem to signify the substance of anything, since all are said of some underlying subject and none is a *this something*.[340] And as for the things that would seem most of all to signify substance, water and earth and fire and air, from which composite bodies are composed, heat and cold and the like are attributes of these, not substances, and only the body possessed of these attributes persists as a sort of being, that is, a sort of substance. But then body is certainly substance to a lesser degree than surface, surface than line, and line than unit and point. For it is by these that body is defined, and it seems possible for them to exist without body but impossible for body to exist without them.[341] That is why,

while most thinkers and the earlier ones thought that substance and being were body and that other things were attributes of this, so that the starting-points of bodies were also the starting-points of beings, later and seemingly wiser thinkers thought that these were numbers.[342] As we said then, if these are not substances, there is no substance or being at all—for the coincidents of these, at any rate, certainly do not deserve to be called *beings*.

But then, if it is agreed that lines and points are substance to a higher degree than bodies, but we do not see to what sort of bodies they might belong (for it is impossible for them to be in perceptible ones), then no substance would exist at all.[343] Further, it is evident that all these things are divisions of bodies—one in breadth, one in depth, one in length.

In addition to these, any shape whatever is present in the solid in the same way, or else none at all is. Thus if Hermes is not present in the stone, neither is the half of the cube present in the cube as something definite; therefore neither is the surface, since if any surface whatever were present, so too would be the surface that determines the half. And the same argument also applies to line, point, and unit. Thus if body is in the highest degree substance, and these divisions are so more than body is, but these do not exist nor are they certain substances, then it escapes us what being is, and what the substance of beings is.[344]

In addition to what has been said, the consequences that follow where coming to be and passing away are concerned are unreasonable. For it seems that substance, whether it did not exist earlier but does exist now or existed earlier but does not exist later, undergoes these through coming to be and passing away. But points, lines, and surfaces neither admit of a process of coming to be nor of passing away, though at one time they exist and at another do not. For when bodies make contact or are divided, at one time (when they make contact) there immediately comes to be one surface, whereas at another time (when they are divided) there immediately come to be two, so that when they are put together their surfaces do not exist, but have passed away, whereas when they are divided, surfaces exist that did not exist earlier (for it certainly is not that an indivisible point has been divided into two). And if they come to be and pass away, from what do they come to be? The case is also quite similar to that of "the now" in time, since it does not admit of coming to be or passing away either, yet it seems to be always something distinct nevertheless, because it is not a sort of substance.[345] It is clear that it is similar where points, lines, and planes are concerned. The argument is the same, since they are in a similar way either limits or divisions.

B 6

[P14a] And we might in general raise the puzzle as to why it is even necessary to look for other things beyond perceptibles and intermediates, such as the Forms that we posit.[346] For suppose it is because of this, namely, that the objects of mathematics, while they differ from the things we find around here in some other respect, in there being many of the same form they do not differ at all, so that their starting-points will not be definite in number (just as the starting-points of the writings that exist here are not definite in number either, although they are so in form—provided we do not take the starting-points of this syllable here or of this voiced sound here, since of these the starting-points will be definite in number as well—and similarly too in the case of the intermediates, since things of the same form are unlimited in number there as well).[347] Thus if there are not, beyond perceptibles and the objects of mathematics, other things such as some people say the Forms are, there will not be substance that is one in number, but in form, nor will the starting-points of beings be so-and-so many in number, but in form.[348] Accordingly, if this is necessary, it is also necessary because of it to posit that the Forms exist. For even if those who say this do not articulate it well, still this is what they mean at least, and it is necessary for them to say these things, because each of the Forms is a sort of substance and none exists coincidentally.

But then, if we *are* to posit both that the Forms exist and that the starting-points are one in number, not in form, we have said what impossibilities necessarily follow.[349]

[P13] Closely connected with these topics is going through the puzzles about whether the elements are [causes] potentially or in some other way.[350] For if it is in some other way, something else will be prior to the starting-points (for the capacity is prior to that other cause, and not all of what is capable of being in a certain way is in that way).[351] But if the elements are [causes] potentially, it is possible that none of the other beings should exist.[352] For even what is not yet has the potentiality to be, since what is not [yet] does come to be, whereas none of the things that lack the potentiality to be comes to be.

[P12] So we must go through both these puzzles about the starting-points and ask whether they are universal or exist in the way we say particulars do. For if they are universal, they will not be substances. For no common thing signifies a this something but a such-and-such sort of thing, whereas substance is a this something.[353] And if we are to posit that what is predicated in common is a this something and can be set out, then Socrates will be many animals: himself and the human

and the animal—if indeed each of these signifies a this something and one thing.[354]

If then the starting-points are universals, these things follow. But if they are not universals, but [exist] as particulars, they will not be scientifically knowable. For scientific knowledge of all things is universal. Thus there will be other starting-points prior to *the* starting-points, namely, those that are predicated universally, if indeed there is going to be scientific knowledge of these.

Book Gamma (IV)

Γ 1

There is a science that gets a theoretical grasp on being qua being and of the [coincidents] belonging intrinsically to it.[355] But this is not the same as any of the so-called special sciences, since none of these investigates being qua being in a universal way. Rather, each cuts off a part of being and gets a theoretical grasp on what is an [intrinsic] coincident of that—as, for example, the mathematical sciences do. But since we are inquiring into the starting-points and the highest causes, clearly these must be the starting-points and causes of some nature as it is intrinsically.[356] So if those who were inquiring into the elements of beings were inquiring into these same starting-points, it is necessary that the elements too be elements of being not coincidentally but qua being. That is why it is of being qua being that we too must grasp the primary causes.

Γ 2

Something is said to be in many ways, however, but with reference to one thing and one nature—that is, not homonymously.[357] Rather, just as what is healthy all has reference to health, one by safeguarding it, another by producing it, one by being an indication of health, another because it is a recipient of it, and what is medical all has reference to the craft of medicine (for one thing is said to be medical by possessing the craft of medicine, another by being naturally well disposed to it, another by being a result of the craft of medicine), and we shall find other things that are said to be in ways similar to these, so, too, something is said to be in many ways, but all with reference to one starting-point.[358] For some things are said to be because they are substances, others because they are attributes of substances, others because they are a route to substance, or else by being passings away, lacks, or qualities of substance, or productive or generative either of substance or of things that are said to be with reference to substance, or denials of one of these or of substance (that is why we say even of not being that it *is* not being).[359]

And so just as of all healthy things there is one science, so it is in the case of the others as well.[360] For not only in the case of things that are said to be in accord with one thing does it belong to one science

to get a theoretical grasp on them, but also in the case of things that are said to be with reference to one nature, since even these are in a way said to be in accord with one thing.[361] So it is clear, in the case of beings too, that it belongs to one science to get a theoretical grasp on them qua beings. In every case, however, a science in the fullest sense is of what is primary, and of what the other things are based on, and because of which they are said to be. So if this is substance, it will be of substances that the philosopher must possess the starting-points and causes.

Of every one genus (*genos*) there is both one perception and one science—for example, grammar, which is one science, gets a theoretical grasp on all voiced sounds.[362] That is why to get a theoretical grasp on all the sub-kinds (*eidos*) of being qua being belongs to a science that is one in kind (*genos*), and to the sub-kinds (*eidos*) of it to get such a grasp on the sub-kinds (*eidos*).

Being and one are the same and one nature, in that they follow along with each other, just as starting-point and cause do, but not in that they are made clear by one account (although it makes no difference if we do take them like that, instead it in fact helps with our work).[363] For *one human* and *a human who is* and *a human* are the same thing, and no other thing is made clear by an expression that uses two of them, "He is a human and a human who is."[364] On the contrary, it is clear that the two are separated neither in coming to be nor in passing away, and similarly in the case of being one.[365] And so it is evident that the addition in these cases makes the same thing clear, and that being one is nothing beyond being. Further, the substance of each thing is one in no coincidental way, and likewise is just a certain sort of being.[366]

So there are as many sub-kinds (*eidos*) of being as there are of being one, and to get a theoretical grasp on the what-it-is of each of them belongs to a science that is one in kind (*genos*)—I mean, for example, on same, similar, and other such things. Pretty much all of the contraries are referred back to this starting-point. The theoretical grasp we got on these in the "Selection of Contraries" may suffice.[367]

And there are as many parts of philosophy as there are [sub-kinds] of substances, and so it is necessary for there to be a primary philosophy among them and one that follows this.[368] For being and being one fall straightaway into kinds (*genos*), which is why the sciences will follow these.[369] For a philosopher is said to be what he is just like a mathematician, since mathematics also has parts, and there is a first and a second science and other successive ones within mathematics.[370]

But since it belongs to one science to get a theoretical grasp on opposites, and being many is opposed to being one (and to get a theoretical grasp on the denial and the lack belongs to one science, because in both cases we are getting a theoretical grasp on the one thing of which it is the denial or the lack, since we either say that unconditionally it does not belong or that it does not belong to some genus, and in the latter case the differentia is present beyond what is in the denial, for the denial is [just] the thing's absence, and in the case of the lack a certain nature is also involved that is the underlying subject of which it is said), and [to repeat] being many is opposed to being one, so that to know the opposites of the things we mentioned—other and unlike and unequal, and everything else that is said to be either in accord with these or in accord with being many and being one—belongs to the science we mentioned.[371]

But contrariety is also one of these. For contrariety is a sort of difference, and difference a sort of distinctness. So, since things are said to be one in many ways, these things will all be said to be in many ways. Nonetheless, it belongs to one science to know all of them. For it is not when they are said to be in many ways that knowing all of them belongs to distinct sciences, but when they are neither said in accord with one thing nor is there one thing to which their accounts are referred back. But since all things are referred back to what is primary, (as, for example, all things that are said to be one are referred back to what is primarily one), this is also what we should say holds of same, other, and contraries generally. And so after determining the number of ways in which something is said to be each of them, we then have to explain, by reference to what is primary in each predication, the way things are said to be in relation to *that*. For some things will be said to be by possessing it, some by producing it, others in other such ways.

It is evident, then, that it belongs to one science to have an account of these as well as of substance (which was one of the very puzzles we mentioned), and that it belongs to the philosopher to be able to get a theoretical grasp on all of them.[372] For if it does not belong to the philosopher, then who will be the investigator of whether Socrates and Socrates seated are the same, or whether one thing has one contrary, or what a contrary is, or in how many ways something is said to be a contrary? And similarly with other questions of that sort. So, since these things are intrinsic attributes of being one qua being one and of being qua being, and not qua being numbers or lines or fire, it is clear that it belongs to that science to know both what each of them is and also their [intrinsic] coincidents.[373] And the error made by those who investigate these questions is not that they are not doing philosophy, but that substance is a topic about which they comprehend nothing.

For just as of number qua number there are special attributes (for example, oddness, evenness, commensurability, equality, excess, deficiency), and these belong to all numbers either intrinsically or in relation to each other (and similarly there are other special attributes of what is solid, of what is immovable, of what is moving, of what is weightless, and of what has weight), so too there are certain special attributes of being qua being , and it is about these that it belongs to the philosopher to investigate the truth.[374]

An indication of this is that dialecticians and sophists in fact cut the same figure as the philosopher. For sophistic is only apparently wisdom, and dialecticians discuss all [these] things, and being is common to all [these], but clearly they discuss them because they properly belong to philosophy.[375] So sophistic and dialectic are indeed concerned with the same kind (*genos*) as philosophy, but philosophy differs from dialectic in the way its capacity is employed, and from sophistic in the life it deliberately chooses.[376] For dialectic employs peirastic about the issues philosophy seeks to know about, while sophistic appears to be knowledge but is not.[377]

Further, one of the two columns of contraries is a lack, and all of them are referred back to being and not being, and of being one and being many (as, for example, being at rest belongs with being one, moving belongs with being many). And pretty much everyone agrees that beings and substance are composed of contraries; at any rate, they all say that the starting-points are contraries. For some say that they are odd and even, some that they are hot and cold, some that they are limited and unlimited, some that they are love (*philia*) and strife. And all the others are evidently also referred back to being one and being many (let us take this referring back as established), and the starting-points posited by other thinkers also fall completely under one and many as their kinds (*genos*).[378] **1005ᵃ1**

So it is evident from these considerations too that it belongs to one science to get a theoretical grasp on being qua being. For all things either are or are derived from contraries and the starting-points of contraries are being one and being many.[379] And these belong to one science, whether they are said in accord with one thing or are not said in accord with one thing (which is presumably in fact the truth). Nonetheless, even if things are said to be one in many ways, the others will be said to be one with reference to the first, and contraries similarly. And because of that—and if being or the one is not a universal and the same over all things or separable, as presumably it is not, but some things are said to be or to be one with reference to one thing, others in virtue of succession—and because of that [to repeat], it does not belong to the geometer to get a theoretical grasp on what a contrary

is, or what completeness is, or what being or being one is, or same or other, except on the basis of a hypothesis.[380]

It is clear, then, that it does belong to one science to get a theoretical grasp on being qua being, and on the attributes that it has qua being, and that the same science will get a theoretical grasp not only on substances but also on their attributes, both the aforementioned ones and prior and posterior, genus and species, whole and part, and others of this sort.

Γ 3

We do, however, have to say whether it belongs to one science or to distinct ones to get a theoretical grasp both on what in mathematics are called "axioms" and on substance.[381] It is evident, then, that the investigation of these does also belong to one science and, besides, that the one in question is the philosopher's. For these axioms hold of all beings, and not of some special genus separate from the others. Also, because they are true of being qua being and each genus is a genus of being, all people do use them. However, they use them only so far as is adequate for their purposes, that is, so far as the genus extends about which they are carrying out their demonstrations.

So, since it is clear that these axioms hold of all things qua beings (for this is what is common to them), it belongs to the person who knows being qua being to get a theoretical grasp on them as well. That is why none of those who investigate a part [of being]—neither geometer nor arithmetician—attempts to say anything about them, as to whether or not they are true. But some natural scientists, as makes perfect sense, did do this, since they were the only ones who thought that they were both investigating nature as a whole and investigating being. But since there is someone further, higher than the natural scientist (for nature is one particular kind (*genos*) of being), it will belong to him whose theoretical grasp is universal and concerned with primary substance also to investigate these axioms.[382] Natural science, however, is a sort of wisdom too, but it is not the primary sort.[383]

As for the attempts of some of those who speak about the truth, as to the way in which it should be accepted, they do this because of a lack of educatedness in analytics.[384] For people should come with prior scientific knowledge of analytics, not look for it while listening [to lectures in the science they are learning].

It is clear, then, that it belongs to the philosopher—that is, to the one who gets a theoretical grasp on the nature of all substance—also to investigate the starting-points of deductions. And it is fitting for

the one who knows best about each kind (*genos*) to be able to state the most stable starting-points of his subject matter, and so when this is beings qua beings, the most stable starting-points of all things. And this person is the philosopher. The most stable starting-point of all, however, is the one it is impossible to be deceived about.[385] For such a starting-point must be both the best known—since it is things that people do not know that they can all be fooled about—and unhypothetical.[386] For a starting-point that must be possessed by anyone who is going to apprehend *any* beings is no hypothesis. And what someone must know who knows anything at all, he must already possess. It is clear, then, that such a starting-point is the most stable of all.

What it is, however, we must next state. It is: that the same thing cannot at the same time belong and also not belong to the same thing and in the same respect (and let us assume that we have also added as many other qualifications as might be needed to respond to logico-linguistic difficulties).[387] This, then, is the most stable of all starting-points, since it has the aforementioned distinguishing feature. For it is impossible for anyone to take the same thing to be and not to be, as some people think Heraclitus says.[388] For it is not necessary for what someone says to be what he takes to be so. But if it is not possible for contraries at the same time to belong and not belong to the same thing (and let us assume that the usual qualifications have been added to this proposition too), and if what is contrary to a belief is the belief in its contradictory, then it is evident that it is impossible for the same person at the same time to take the same thing to be and not to be, since a person who has false views on this point would hold contrary beliefs at the same time.[389] That is why all who are carrying out a demonstration lead it back to this as an ultimate belief, since this is by nature the starting-point of all the other axioms too.[390]

Γ 4

But there are some people who, as we said, themselves assert both that it is possible for the same thing to be and not to be and also to take this to be so. Many even of those concerned with nature make use of this claim.[391] But we have just taken it to be impossible for anything at the same time to be and not to be, and by means of this we have shown that it is the most stable of all starting-points.[392]

Now some people do demand that we demonstrate even this, but this is due to lack of educatedness.[393] For it is lack of educatedness not

to know what things we should look for a demonstration of and what things we should not. For it is in general impossible to demonstrate everything (for it would go on without limit, so that even then there would be no demonstration). But if there are things we should not look for a demonstration of, these people would not be able to say what starting-point they think has more of a claim to be such.

There is, however, a demonstration by refutation even that this view [that we started with] is impossible, if only the disputant says something.[394] But if he says nothing, it is ridiculous to look for an argument against someone who has an argument for nothing, insofar as he has none. For such a person, insofar as he is such, is like a vegetable. And by "demonstrating by refutation" I mean something different from demonstrating, because in demonstrating we might seem to be assuming the starting-point at issue, but if the other person is responsible for an assumption of this sort, it would be refutation not demonstration.

The starting-point for all such arguments is to ask the disputant not to *state* something to be or not to be (since someone might take this to be assuming the starting-point at issue), but rather to *signify* something both to himself and to another person, since that is necessary if indeed he is to say something.[395] For if he does not grant this, no argument is possible for such a person, either with himself or with another. But if he does grant it, demonstration will be possible, since there will already be something definite. The one responsible for it, however, is not the one who gives the demonstration but the one who submits to it, since in doing away with argument, he submits to argument. Further, anyone who agrees to this has agreed that something is true without a demonstration, so that not everything will be so-and-so and not so-and-so.[396]

[A1] First, then, this at least is clearly true: the name [agreed to signify something by the disputant] signifies is or is not this, so that not everything will be so-and-so and not so-and-so.[397]

[A2a] Further, if "the human" signifies one thing, let this be *the two-footed animal*.[398] I mean by "signifying one thing" that if human is this, then insofar as anything is human, this will be the being for human.[399] But even if someone were to say that the name involved signifies more than one thing, it makes no difference, provided that these were definite, since to each account a distinct name could be assigned. I mean, for example, if someone were to say that "the human" signified not one thing but several things, and the account of one of these was "the two-footed animal," although there were also several other accounts of it, but a definite number of them. For a special name could be assigned to

each account. If, however, he did not assign that way, but instead said that "the human" signified an unlimited number of things, it is evident that no argument would be possible [with him].[400] For not to signify one thing is to signify nothing, and if names do not signify, discussion with others is done away with, as in truth it is even with ourselves.[401] For it is not possible even to understand without understanding one thing.[402] On the other hand, if it is possible, then one name could be assigned to this thing.

Suppose then, as we said at the start, that the name signifies something, and that it signifies one thing. It is not, then, possible that "the being for human" should signify just what is not being for human, if "the human" signifies not only about one thing but also one thing.[403] For we do not think that this is what it is to signify one thing, namely, to signify about one thing. For *that* way even "the musical" and "the pale" and "the human" would signify one thing, and so all would be one, since they would be synonymous.[404]

Also, it will not be possible to be and not to be the same thing except homonymously—as if what we call "human" others were to call "not human." But the puzzling thing is not this, namely, whether it is possible for the same thing at the same time to be and not be human in name, but whether it is possible for it to be so in fact. If, however, "the human" and "the not human" do not signify distinct things, it is clear that neither will "the not being for human" signify something distinct from "the being for human," and so the being for human will be the not being for human, since they will be one thing (for "to be one thing" signifies this: to be like mantle and cloak, if their account is one). But if they are one thing, then "the being for human" and "the being for not human" will signify one thing. It has been shown, however, that they signify distinct things.[405] Therefore, if it is true to say of something that it is human, then it is necessary for it to be two-footed animal, since this is what "the human" signified. And if that is necessary, then it is not possible for the same thing not to be at that time the two-footed animal (for "necessary for it to be" signifies this: that it is impossible for it not to be). Hence it is not possible at the same time for it to be true to say that the same thing is human and is not human.

[A2b] And the same argument also applies in the case of not being human. For "the being for human" and "the being for not human" **1007ª1** signify distinct things, if indeed even "to be the pale" and "to be the human" signify distinct things. For the former are much more opposed, and so signify something distinct. But if the disputant says that "the pale" too signifies one and the same thing as "the human," we will say just the same as we said before, namely, that all—and not only

opposites—will be one. But if that is not possible, what we have stated follows, if he will answer what he is asked.

But if, when he is asked the question unconditionally, he adds the denials as well, he is not answering the question asked. For there is nothing to prevent the same thing from being human and pale and a thousand other things. Nonetheless, since the question was whether it is true to say that this thing is human or not, the answer should signify one thing and not add that it is also pale and large. And in fact it is impossible to go through all its coincidents, which are unlimited in number. So he should go through either all or none. Similarly, therefore, even if the same thing is a thousand times human and not human, he should not, in answering the question whether it is human, add that it is at the same time also not human, unless he is to add the other coincidents too, those that it is and that it is not. But if he does that, he is not engaged in discussion.

[A2c] And in general those who say this do away with substance and essence. For it is necessary for them to say that all are coincidents and that there is no such thing as just the being for human or just the being for animal.[406] For if anything is to be just [the] being for human, this will not be [the] being for not human or [the] not being for human (and yet these are its denials).[407] For what was signified was one thing, and this was something's substance. But to signify the substance of something is to signify that the being for it is no other thing. But if for it to be just the being for human is either for it to be just the being for not human or just the not being for human, it will be some other thing, so that it is necessary for them to say that this sort of account applies to nothing, but that all are coincidental. For substance and coincident are distinguished by this: the pale coincides with the human because he is pale but not just [what] pale [is].

But if everything is said coincidentally, there will be no primary thing that they are said of, if a coincident always signifies a predication of some underlying subject. Hence it is necessary for predication to go on without limit; but that is impossible, since no more than two things can be combined in predication. For a coincident does not coincide with a coincident, unless it is because both coincide with the same subject. I mean, for example, that the pale is musical and the musical is pale, because both coincide with the human.[408] But it is not the case that Socrates is musical in that way, namely, that both [he and it] coincide with some other thing. Accordingly, since some things are said coincidentally in the former way, others in the latter, those said in the way in which the pale coincides with Socrates cannot form an unlimited series in the upward direction (so that, for example, of

pale Socrates some other thing is a coincident), since no one thing comes about from all of them.[409] Nor indeed will another thing—for example, the musical—be a coincident of the pale, since it no more coincides with the pale than the pale does with it. At the same time too what coincides in this way has been distinguished from what coincides in the way in which the musical coincides with Socrates. But in cases of the latter sort the coincident does not coincide with a coincident, although in those of the former sort it does, so that not everything will be said coincidentally. Even [when things are said] in this way, then, there will be something signifying substance. And if that is so, it has been shown that contradictories cannot be predicated at the same time.

[A3a] Further, if contradictories are all true of the same thing at the same time, it is clear that all will be one.[410] For the same thing will be a trireme and a wall and a human, if it is possible either to affirm or deny something of all of them, as those who give the argument of Protagoras must do.[411] For if a human is believed by someone not to be a trireme, then clearly he is not a trireme—and so, he also *is* a trireme, if indeed the contradictory is true. Indeed, we also, then, get the view of Anaxagoras, that all things were together, so that there is nothing that is truly one.[412] It is about the indefinite, then, that they would seem to be speaking, and while they think they are speaking about being, they are really speaking about not being. For it is potential being but not actual being that is indefinite.[413]

But then they must at least affirm or deny everything of everything. For it would be strange if to each thing its denial belonged, while the denial of some other thing, which does not belong to it, did *not* belong to it. I mean, for example, that if it is true to say of a human that he is not a human, it is clear that he is both a trireme and not a trireme. So if the affirmation belongs, the denial does too. But if the affirmation does not belong to him, at least the denial belongs to him more than his own denial does. So if even the latter belongs to him, the denial of trireme will belong to him too; and if it does, the affirmation of it will as well.

[A3b] And not only does this follow for those who give this argument, but it also follows that it is not necessary either to affirm or deny.[414] For if it is true that he is a human and not a human, it is clear that he will also be neither a human nor not a human. For of the two there are two denials, but if one is composed of the former two, it will also be opposed by one.[415]

[A4] Further, either this applies to all of them, and a thing is both pale and not pale, both being and not being, and similarly for all other

affirmations and denials, or it does not do so, but applies to some and does not apply to others. And if it does not apply to all, these could be agreed on. But if it does apply to all, then once again either the denial will belong wherever the affirmation does and the affirmation will belong wherever the denial does, or else the denial will belong wherever the affirmation does but the affirmation will not always belong where the denial does. [A4a] And if the latter is the case, there will be something that is assuredly *not* being, and this will be a stable belief. And if not being is something stable and knowable, the opposite affirmation will be more knowable. [A4b] But if anything denied can also equally well be affirmed, then necessarily either it is true to divide and say, for example, that a thing is pale and, in turn, to say that it is not pale, or it is not true. [A4b–i] But if it is not true to divide and say this, then he is not really saying these things and nothing whatever has being. (How, though, could things that do not have being walk and talk?) Also, all things will be one, as we said earlier, and the same thing will be human and god and trireme and the denials of these (for if they belong in the same way to each thing, one thing will in no way differ from another, since if it did differ, that would be true and special to it). [A4b–ii] Similarly, even if it is possible to divide and speak truly, what we have said still follows, and in addition everyone will speak truly and everyone will speak falsely, and so the disputant will speak falsely by his own admission.

At the same time it is evident that in response to this person there is nothing for an investigation to be about, since he says nothing. For he says neither that it is so-and-so nor that it is not so-and-so, but that it both is so-and-so and is not so-and-so; and then again he denies both of these, saying that it is neither so-and-so nor not so-and-so. For if he did not, something would already be definite.

[A5] Further, if whenever an affirmation is true, its denial is false, and whenever it is true, the affirmation is false, it will not be possible both to affirm and to deny the same thing truly at the same time. (But presumably disputants might say that this was the very point at issue from the start.)

[A6] Further, is someone who takes it that something is some way, or that it is not some way, speaking falsely, while someone who takes it that it is both is speaking truly? For if the latter is speaking truly, what can be meant by saying that the nature of beings is like that? But if he is not speaking truly, but is speaking more truly than someone who takes it in the former way, then beings will already be in some way, and this will be true and not at the same time also not true. And if all

speak both falsely and truly to the same degree, there will be nothing for a person in that condition to utter or say. For at the same time he says this and also not this. And if he takes nothing to be so, but instead thinks and does not think to the same degree, how would his state be any different from a vegetable's?

From this too it is entirely evident that no one—whether other people or those who give this argument—is in fact disposed in this way. For why does someone walk to Megara instead of staying where he is, when he thinks he should walk there?[416] Why does he not early one morning march straight into a well or into a ravine, if one happens to be about, instead of taking evident care to avoid doing so, as if he were someone who is *not* to the same degree thinking that it is not good to fall in and that it is good?[417] Hence it is clear that he takes one thing to be better and that the other not better. And if this is so, he must also take one thing to be human and another not human, one thing sweet and another not sweet. For he does not look for and take all things to be equally so (for if he thinks it is better to drink water and to see a human, he proceeds to look for these things), and yet he *should* do so, if the same thing were to the same degree human and not human. But, just as we said, there is no one who does not take evident care to avoid some things and not others, so that, as it seems, everyone takes something to hold unconditionally, if not about all things, then about what is better and worse. And if this is not scientific knowledge but belief, they should be all the more concerned about the truth, just as someone who is sick should be more concerned about health than someone who is healthy. And indeed someone who has beliefs, when compared to someone who has scientific knowledge, is not in a healthy condition in relation to truth.[418]

[A7] Further, however much all things may be so-and-so and not so-and-so, still there is certainly a more and less present in the nature of beings. For we would not say that two and three are to the same degree even, or that someone who thought that four things were five and someone who thought they were a thousand were to the same degree deceived. If, then, they are not these things to the same degree, it is clear that one of them is such to a lesser degree, and so is more true. So if what is more is closer, then there must be something true to which the more true is closer. And even if there is not, at any rate there is already something more secure and more truth-like, and we shall have set ourselves free from the extreme version of the argument that prevents us from having anything definite in our thought.

Γ 5

The argument of Protagoras also derives from the same belief, and both alike must be either true or untrue.[419] For if all the things that seem to be so and all the appearances are true, everything must at the same time be true and false.[420] For many people take things to be so that are contrary to those taken to be so by others, and think that people who do not believe what *they* believe are deceived, so that it is necessary for the same thing to be and also not to be. And if that is the case, then the things that seem to be so must all be true. For those who believe falsely and those who believe truly believe opposite things from each other. So if beings are the relevant way, everyone will believe truly. It is clear, then, that both arguments derive from the same line of thought.

But the same way of inquiry should not be used in response to all the disputants we encounter, since some need persuasion, others force.[421] For the ignorance of those who take this to be so because they were puzzled is easily cured, since the reply to them is directed not at the argument but at the line of thought [behind it]. Those, on the other hand, who state it for the sake of argument must be cured by refutation of the argument as expressed in their speech and their words.

Those who are genuinely puzzled come to this belief from perceptibles. [1] They believe that contradictories and contraries belong to things at the same time because they see contraries coming to be from the same thing. So if it is not possible for what is not to come to be, the thing in question must have previously been both alike. And as Anaxagoras says, "everything is mixed in everything," and also Democritus, since he says that the void and the full belong alike to every part whatever, and yet one of these is being and the other not being.[422] In response to those, then, who take what they take to be so on this basis, we shall say that in one way they speak correctly but in another way they speak in ignorance. For things are said to be in two ways, so that in one way it is possible for something to come to be from not being, whereas in another way it is not, and for the same thing at the same time to be and not to be, although not in the same way. For it is possible for contraries to potentially belong to the same thing at the same time, but not to do so actually. Further, we shall require them to take it that among beings there is also another sort of substance to which neither movement nor passing away nor coming to be at all belongs.[423]

[2] Similarly, too, some have come to believe in the truth of appearances on the basis of perceptibles.[424] For they think it inappropriate to discern the truth by the large or small number [of people who believe it], but that the same thing seems sweet to some who taste it, bitter to

others, so that if all were sick or bereft of thought, while two or three were healthy or possessed of understanding, it is these who would seem to be sick and bereft of thought and not the others. Further, many of the other animals have appearances contrary to ours concerning the same things, and even for each one of us, relative to himself, the same things do not always seem the same to perception. Which, then, of these appearances is true or false is unclear. For the one lot is no more true than the other lot, but rather equally so. That is why Democritus, at any rate, says that either there is no truth or that to us at least it is unclear.

In general, however, it is because they take perception to be thought, and take it to be an alteration, that they say that what appears to perception must of necessity be true.[425] For it is on the basis of these views that both Empedocles and Democritus and (one might almost say) all the others have been captivated by beliefs of this sort. And Empedocles in fact says that people who change their state change their wisdom:

> For cunning increases in men in relation to what is present to their senses.

And elsewhere he says that:

> To the extent they change over to become altered, to that extent they always find
> Their thinking too presenting other things.[426]

And Parmenides expresses himself in the same way:

> For as at each moment is the mixture of their much wandering parts,
> So is understanding present in men. For the same thing
> Is just what does the thinking, namely, the nature of his parts,
> In each and every human. For what predominates is what is understood.[427]

A saying of Anaxagoras to some of his companions is also recorded, that "things would be for them as they took them to be." People say that even Homer evidently held this belief, because he made Hector, when he was stunned by a blow, lie there "thinking altered thoughts," as if even those bereft of thought are thinking, but not the same thoughts.[428] So it is clear that if both are states of thinking, then beings will be so-and-so and not so-and-so at the same time. And it is insofar as this is so that the consequences are most difficult. For if those who have seen as much of the truth as is possible for us (and these are the ones who look for it the most and love it the most)—if they hold beliefs of this

sort and express these views about the truth, how can we expect beginners in philosophy not to lose heart? For to look for the truth would be a wild goose chase.

1010ª1 What caused these people to hold this belief, however, was that while investigating the truth about beings, they took the only beings to be the perceptible ones, and in these there is much of the nature of the indefinite—that is, of the sort of being we described.[429] That is why, though they speak in a perfectly sensible way, they do not speak truly. 5 (For it is more fitting to put the matter like that than as Epicharmus put it against Xenophanes.[430]) Further, seeing that all this sort of nature is in movement, and that about what is changing nothing true can be said, they concluded that about what is in every respect and in every way changing, at any rate, it is not possible to grasp the truth. For it was 10 this supposition that blossomed into the most extreme of the beliefs we have mentioned, that of the declared Heracliteanizers. This was also the sort held by Cratylus, who in the end thought that he should say nothing, but instead only moved his finger, and criticized Heraclitus for saying that it is not possible to step into the same river twice, since he thought that we could not do so even once.[431]

15 We, however, in response to this argument too shall say that while they do have some argument for thinking that what is changing, when it is changing, *is not*, yet even *this* is disputable. For what is losing something has some of what is being lost, and of what is coming to be, something must already be.[432] And in general if something is passing away, there will be something that it is, and if something is coming to 20 be, there must be something from which it comes to be and something by which it is generated, and this does not go on without limit. But leaving that point aside, we may say this, that it is not the same thing to change in quantity and to change in quality.[433] Granting, then, that a thing's quantity does not remain what it was, still it is by its form [not its quantity] that we know each thing.

25 Further, those who took this to be so could fairly be criticized for asserting about the whole of the heaven what they saw only in a minority even of perceptibles.[434] For the region of the perceptible realm around us is the only one that remains in a permanent process of coming to be and passing away. But this is (one might almost say) not even 30 a fraction of the whole, so that it would be more just to acquit this portion because of the other than to condemn the other because of it.

Further, it is clear that we shall also say in response to these people what we said before, since it must be shown to them, and they must be persuaded, that there is a certain nature that is immovable.[435] Indeed, 35 to say that things at the same time are and are not is to imply that all of

them are at rest rather than that they are moving, since there is nothing for things to change into, since everything belongs to everything.[436]

But where truth is concerned, [we must show] that not everything that appears is true. First, even if perception, at any rate of a special object, is not false, still imagination is not the same thing as perception.[437] Again, it is fair to wonder if our respondents are really puzzled as to the following: whether magnitudes and colors are such as they appear to people at a distance, or as they appear to those close at hand; or whether they are such as they appear to the healthy or such as they appear to the sick; or whether things are heavier if they appear so to weak people or if they appear so to strong ones; or whether things are true if they appear so to those asleep or to those awake. For that the people involved do not think so, at least, is evident. At any rate, no one who is in Libya and [while asleep] one night takes himself to be in Athens sets off for the Odeon [when he wakes up]. Further, where the future is concerned, as Plato too says, the belief of a doctor and that of an ignorant person are surely not equally in control [of the truth]—for example, about whether someone is going to become healthy or not going to.[438] **1010ᵇ1**

Further, among perceptual capacities themselves there is not the same degree of control in the case of the object of a capacity other than itself as in that of its special object, nor in the case of a neighboring object as in that of its own, but where color is concerned it is sight that has control, not taste, and where flavor, it is taste that has it, not sight.[439] And each of these never says in the same time frame about the same thing that it is so-and-so and not so-and-so at the same time. Nor even when different time frames are involved was there dispute about the attribute, but about the thing with which the attribute coincided. I mean, for example, that the same wine might, if either it changed or the body of the perceiver changed, seem at one time sweet and at another time not sweet. However, *the sweet*, the sort of thing it is when it is present, has in no way changed, rather the sense always grasps the truth about it, and whatever is to be sweet is of necessity of this sort. And yet all these arguments do away with this, and just as nothing is substance, so nothing is of necessity either. For what is necessary cannot possibly be in one state *and* another, so that if anything is of necessity, it will not be both so-and-so and not so-and-so.[440]

And in general, if indeed only the perceptible exists, nothing would exist unless animate beings existed, since there would be no perception. Now that neither perceptibles nor perceptions would exist is presumably true (since this is a way of the perceiver's being affected), but that the underlying subjects that produce perception would not exist even without perception is impossible.[441] For perception is certainly

not perception of itself, but there is also some other thing beyond the perception, which is necessarily prior to the perception.[442] For what moves something is prior in nature to what is moved, and even if they are said to be with reference to each other, this is no less so.[443]

Γ 6

There are some people who are puzzled, however, both among those who are persuaded by all this and among those who merely give these arguments.[444] For they are inquiring about who will discern the person of sound mind and, in general, concerning each thing, discern it correctly.[445] But puzzles of this sort are like being puzzled about whether we are asleep now or awake, and all such puzzles amount to the same thing. For those who pose them demand an argument for everything. For they are looking for a starting-point, and to get hold of it through demonstration, since that they, at any rate, are not persuaded is evident in their actions. But just as we said, this is how they are affected.[446] For they are looking for an argument for things for which there is no argument, since the starting-point of demonstration is not a demonstration.[447]

These people, then, might be easily persuaded of this, since it is not difficult to grasp. But those who are looking to find in argument alone the force [that will persuade them] are looking for the impossible. For they demand to state things contrary, and at once are stating contrary things.[448]

If, however, not everything is relative to something, but some things also are intrinsically, not everything that appears will be true. For what appears, appears to someone, so that the person who says that everything that appears is true makes all beings relative to something. That is why those who are looking to find in argument the force [that will persuade them], and who at the same time also demand to subject themselves to argument, must guard themselves and say that it is not what appears that is true but what appears to the one to whom it appears, when it appears, to the sense to which it appears, and the way it appears. If they subject themselves to argument, however, but not on these terms, they will quickly find themselves stating contrary things. For it is possible for the same thing to appear to be honey to sight but not to taste and—since we have two eyes—for things not to appear the same to the sight of each, if the two sights are dissimilar. For to those who, due to the causes we mentioned earlier, say that what appears is true, and that this is why all things are alike false and true, since the same things do not appear the same to everyone, or even always the

same to the same person, but often things have contrary appearances at the same time (for touch says there are two things when the fingers are crossed, whereas sight says there is one)—to these we shall say, "but not, at any rate, to the same sense and in the same part of it and in the same way and in the same time frame," and so *this* would be true. And presumably this is why those who state these things not because they are puzzled but for the sake of argument must say that it is not true, but true *for this person*. As has also been said before, then, they must make everything relative to something, that is, to belief and perception, so that nothing either has come to be or will be without someone first having a belief about it. But if something has come to be or will be [without anyone's having a belief about it], it is clear that not everything can be relative to belief.

Further, if a thing is one, it is one relative to one thing or to something definite; and if the same thing is both half and equal, still it is not to the double, at any rate, that the equal is relative.[449] If, then, relative to a believer the same thing is human and the object of belief, it is not the believer who will be human but the object of belief.[450] And if each thing is to be relative to a believer, a believer will be relative to things that are unlimited in kind (*eidos*).[451]

The fact that the most secure belief of all is that opposite affirmations are not true at the same time, what the consequence are for those who say that they are, and why it is that they say this, may now be regarded as adequately discussed. But since it is impossible for contradictories to be true of the same thing at the same time, it is evident that contraries cannot belong to the same thing at the same time either. For one of a pair of contraries is a lack no less [than a contrary], or a lack of substance, and a lack is the denial [of a predicate] to some definite kind (*genos*).[452] So if it is impossible at the same time to affirm and to deny truly, it is also impossible for contraries to belong at the same time, unless either both belong in a certain way or one in a certain way and the other unconditionally.

Γ 7

But then neither is it possible for there to be anything in the middle between contradictories, but it is necessary either to affirm or to deny one thing, whatever it may be, of one thing.[453] This will be clear if we first define what truth is and what falsehood is. For to say of what is that it is not, or of what is not that it is, is false, whereas to say of what is that it is, or of what is not that it is not, is true. So he who says of anything that it is, or that it is not, will say either what is true or what

is false. But it is said that neither what is nor what is not either is not or is.[454]

Further, what is in the middle between the contradictories will be so either in the way in which gray is between black and white or in the way in which what is neither a human nor a horse is between the two. Well, if it is in the latter way, what is in the middle could not change [into either of the extremes] (for a thing changes from not good to good or from good to not good), but in fact it evidently always does do this (for there is no change except to opposites or things in the middle). On the other hand, if it is in the middle [in the former way], then in this way too there would be some sort of coming to be that is a change to white but not a change from not white. In fact, though, this is never seen.

Further, every object of thought and every intelligible object is one that thought either affirms or denies—this is clear from the definition—whenever it says what is true or says what is false.[455] Whenever it combines things this way in an affirmation or denial, it says what is true, whenever this other way, it says what is false.[456]

Further, there must be a middle beyond all contradictories, if it [the denial of PEM] is not being stated for the sake of argument.[457] And so someone could neither state the truth nor not state the truth, and there will be something between what is and what is not; and so there will also be a sort of change between coming to be and passing away.[458]

Further, in those kinds (*genos*) in which the denial implies the contrary, even in those there will be a middle—for example, in numbers there will be a number that is neither odd nor not odd; but that is impossible, as is clear from the definition.[459]

Further, the process will go on without limit, and the beings will be not half as many again but even more, since it will be possible to deny *this* in turn as regards its affirmation and denial, and this will be a [new] thing, since its substance is something else.[460]

Further, when someone, on being asked whether something is white, says that it is not, he has denied nothing other than that it is [white], but that it is not [white] is the denial.

Some people, however, have come to this belief as they have to other contradoxical ones: when they are unable to solve eristic arguments, they give in to the argument and accept that the conclusion is true.[461] But while some say what they say due to this cause, others do so because of looking for an argument for everything. In response to all these people, however, the starting-point is based on a definition. But the definition is based on the necessity of they themselves signifying something, for the account of which the name [they use] is a signifier will be a definition.

It seems, though, that whereas Heraclitus' argument, which says that everything is and is not, makes everything true, that of Anaxagoras, that there is something in the middle of contradictories, makes everything false.[462] For when things are mixed, the mixture is neither good nor not good, so that there is nothing true to say.[463]

Γ 8

Given these distinctions it is evident that the one-sided things that some people say, and say about everything, cannot hold good—some saying that nothing is true (for there is, they say, nothing to prevent everything from being like the commensurability of the diagonal), others that everything is true.[464] For these statements are pretty much the same as that of Heraclitus. For anyone who states that everything is true and that everything is false also makes each of these statements separately, so that if indeed each is impossible, the combination of the two is also impossible.

Further, there are manifest contradictories that cannot be true at the same time—and cannot, then, all be false either—although this might *seem*, from what has been said, to be more possible.

Against all such statements, however, we must assume (as was also said in the arguments given above) not that something be or not be, but that something signify something, so that we must base discussion on a definition, having taken for granted what "falsity" and "truth" signify.[465] And if what it is true to affirm is nothing other than what it is false to deny, it is impossible for everything to be false, since of a contradiction one part must be true.

Further, if it is necessary that everything be either affirmed or denied, it is impossible for both to be false, since it is *one* part of the contradiction that is false. Indeed, the often expressed objection to all such statements clearly follows, namely, that they do away with themselves.[466] For anyone who says that everything is true also makes the contrary of his own statement true, and so his own is not true (for the contrary statement denies that it is true), whereas anyone who says that everything is false makes his own statement so as well. But if each makes an exception of these cases, the former saying that the contrary of his statement is alone not true, the latter that his own is alone not false, it follows nonetheless that each must assume an unlimited number of statements to be true or false. For the one that says that the true statement is true is true, and this will go on without limit.

It is evident, though, that neither those who say that all things are at rest nor those who say that all things are moving speak truly.[467] For if

all things are at rest, the same things will always be true and the same ones always false, but it is evident that this changes (for the speaker himself at one time was not and will not be again).[468] And if all things are moving, nothing will be true. Hence everything will be false. But it has been shown that this is impossible. Further, it is necessary that what is changes, since change is from something to something. But then it is not the case that all things are at rest or moving *sometimes*, and nothing *always*. For there is something that always moves the things that are moving, and the prime mover is itself immovable.

Book Delta (V)[469]

Δ 1

Something is said to be a STARTING-POINT if it is: [1] The point in a thing from which we would move first—for example, of a line or of a road there is this starting-point from here, and another from the contrary direction. [2] The one from which each thing would best come to be—for example, even in learning we must sometimes begin not from what is primary, that is, the starting-point of the thing, but from the point from which it is easiest to learn.[470] [3] The component from which a thing first comes to be—for example, as of a ship the keel does and of a house the foundation, whereas of animals some take it that the heart does, some the brain, and others some other such thing.[471] [4] The *non*-component from which a thing first comes to be, from which movement and change naturally first begin—for example, a child comes to be from its father and mother, and a fight from abusive language. [5] The one in accord with whose deliberate choice what is moved is moved and what is changed is changed—for example, the rulers in cities, dynasties, and kingships are said to be *archai*, as are crafts, especially architectonic ones.[472] [6] Further, the one from which a thing can first be known is also said to be a starting-point of the thing—for example, the hypotheses are the starting-points of demonstrations.[473]

Things are also said to be causes in an equal number of ways, since all causes are starting-points.[474]

It is common, then, to all starting-points to be the first thing from which a thing is, or comes to be, or is known; but of these some are components, others external. That is why the nature of a thing is a starting-point, as is the element of a thing, and also thought and deliberate choice, and substance and the for-the-sake-of-which.[475] For of many things the starting-point both of knowledge and of movement is the good and the noble.[476]

Δ 2[477]

Something is said to be a CAUSE if it is: [1] The component from which a thing comes to be—for example, the bronze of a statue or the silver of a bowl, and also the kinds (*genos*) of these.[478] [2] The form

or paradigm, that is, the account of the essence, and kinds (*genos*) of this (for example, of the octave, the ratio 2 : 1 and number in general), and the parts included in the account. [3] Further, that from which the change or rest from change first starts—for example, the person who has deliberated is cause [of the action] and the father of his child and in general the producer is cause of the thing being produced and the change-maker of the change. [4] Further, the end, and this is the for-the-sake-of-which—for example, of taking walks health is the end. For why does he take walks? "In order that he may be healthy," we say. And in speaking that way we think we have presented the cause. Also, anything, then, that comes to be as an intermediate means to the end, when something else has started the movement—for example, in the case of health, making thin, purging, drugs, or instruments, since all these are for the sake of the end, although they differ from each other in that some are instruments and others works.[479]

These, then, are pretty much all the ways in which things are said to be causes, and because they are said to be such in many ways it follows both [a] that there are many causes of the same thing, and not coincidentally (as, for example, a statue has both the craft of sculpture and the bronze as causes—not, in accord with its being another thing but insofar as it is a statue—although not in the same way, but the one as matter and the other as that from which the movement derives), and [b] that things can be causes of each other (as, for example, exercise [is a cause] of good physical condition and the latter of exercise, although not in the same way, but the one as end and the other as the starting-point of movement).[480] Further, the same thing can be the cause of contraries, since the thing that, when present, is the cause of so-and-so, we sometimes hold causally responsible, when absent, for the contrary result—for example, the cause of a shipwreck is the absence of the captain whose presence was a cause of its preservation. Both things, presence and lack, are causes in the way moving causes are.

All the causes now mentioned fall into four most evident ways [of being causes].[481] For phonetic elements are causes of syllables, matter of artifacts, fire, earth, and all such things of bodies, the parts of the whole, and the hypotheses of the conclusion, as being causes from which [the relevant things come].[482] And of these some are causes as underlying subject (for example, the parts), some as the essence (for example, the whole, the mode of constitution, and the form).[483] And the seed, the doctor, the deliberator, and in general the producer are all starting-points from which comes change or rest. The remainder are

causes as the end and the good of other things. For what other things are for the sake of tends to be the best for them and their end. Let us assume that it makes no difference whether we say "good" or "apparent good."[484]

These, then, are the causes and this is the number of their kinds (*eidos*), but the ways of being causes, though many in number, also come under comparatively few headings. For things are said to be causes in many ways, even within the same kind (*eidos*), as being prior or posterior to each other—for example, [as a cause] of health, the doctor and the craftsman; of the octave, the double and number; and in every case whatever includes any of the particular causes.

Further, there are coincidental causes and their kinds (*genos*)—for example, [as a cause of] a statue, in one way Polyclitus, in another a sculptor, because the sculptor coincides with Polyclitus, and, as examples of what includes the coincidental cause, a human is a cause of the statue, or in general an animal, because Polyclitus is human and a human is an animal.[485] And among coincidental causes some are more remote than others, some less—for example, if the pale and the musical were said to be causes of the statue, but not Polyclitus or a human only.[486]

Beyond all the things said to be causes either properly or coincidentally, however, some are said to be so potentially others actively—for example, [as a cause of] the house's being built, a builder on the one hand and a builder building on the other.[487]

Similarly, the things that causes are causes of will also be said to be in the ways mentioned—for example, this statue, a statue, or in general a likeness, or this bronze, bronze, or in general matter; and similarly in the case of coincidental [effects].[488]

Further, both the former [proper] and the latter [coincidental] may be said to be causes in combination—for example, not Polyclitus or sculptor but Polyclitus the sculptor.

But still all of these things are just six [i–vi] in number, each said to be in two ways [a–b]: either [a–i] as the particular, [a–ii] as the kind (*genos*), [a–iii] as the coincidental, or [a–iv] as the kind of the coincidental is, or as these are either [a–v] as combined or [a–vi] as taken simply, and [b] all of them either as actualities or potentially. But they differ to the extent that what is actual and what is particular exists, or does not exist, at the same time as the things it causes—for example, this person curing at the same time as this one recovering his health, this builder building with this building being built.[489] But this is not always the case with what are potentially causes, since the house does not pass away at the same time as the builder.

Δ 3

Something is said to be an ELEMENT if: [1] It is the primary component from which a thing is composed, and indivisible in kind (*eidos*) into other kinds (*eidos*)—for example, the elements of a voiced sound are the things from which the voiced sound is composed and the ultimate things into which it is divided, while *they* are no longer divided into voiced sounds distinct in form from them, rather, if they are divided, their parts are of the same form—for example, a part of water is water (but a part of a syllable is not a syllable).[490] Similarly those who speak of the elements of bodies mean the ultimate things into which bodies are divided, while they are no longer divided into other things differing in form; and whether the things of this sort are one or more than one, they call these elements.

[2] In a quite similar way, things are also said to be the elements of diagrams and, in general, of demonstrations.[491] For the demonstrations that are primary and that are components of more than one other demonstration are said to be elements of demonstrations; and of this sort are the primary deductions consisting of three terms proceeding through one middle.[492]

[3] By metaphorical transference from this case people also call something an element when, being one and small, it is useful for many things. That is why what is small, simple, and indivisible is said to be an element. From which it comes about that most universal things are elements (because each of them, being one and simple, belongs to many things, either to all or to most) and that the one and the point are thought by some to be starting-points. Since, then, the so-called genera are universal and indivisible (for there is no account of them), some say that the genera are elements, and more so than the differentia because the genus is more universal—for where the differentia belongs, the genus too follows along with it, but where the genus belongs, the differentia does not always do so.[493]

Common to all the cases, however, is that the primary component of each thing is an element of it.

Δ 4[494]

What is said to be NATURE (*phusis*) is: [1] In one way, the coming to be of things that grow, as if we were to pronounce the *u* long.[495] [2] In another way, the first component from which a growing thing grows. [3] Further, that from which the first movement in each of the beings that are by nature is present in it insofar as it is itself.[496] Those things

are said to grow that get their increase in size through another thing by making contact and growing together or by adhesion, as in the case of embryos. But growing together differs from contact, since in the case of contact it is not necessary that any other thing exist besides the contact, whereas in the case of things that grow together there is some one thing, the same in both, which makes them grow together instead of [merely] making contact, and makes them one as regards continuity and quantity, although not as regards quality.[497]

[4] Further, that from which some one of the beings that are by nature first is or comes to be, and which is unshaped and cannot be changed from the capacity that belongs to it, is said to be its nature—for example, bronze is said to be the nature of a statue and of bronze artifacts, wood of wooden ones, and similarly in the case of others. For something is from these when the primary matter is preserved throughout.[498] For it is in this way that the elements of the beings that are by nature are also said to be their nature, some saying fire, some earth, some air, some water, and others some or all of these.

[5] Further, in another way the substance of the beings that are by nature is said to be their nature—as, for example, with those who say that the nature is the primary mode of constitution, or as Empedocles says:

> Nothing that is has a nature,
> But rather there is only mixing and separating of things
> Mixed, and "nature" is but a name bestowed on them by men.[499]

That is why, as regards the things that are or come to be by nature, although that from which they naturally come to be or are is already present, we still do not say that they have their nature if they do not have their form or shape. What is by nature, then, is what is composed of both of these—for example, animals and their parts.[500] And nature is both the primary matter—and this in two ways, either primary relative to the thing itself or primary in general (for example, in works of bronze the bronze is primary relative to themselves, but in general perhaps water is primary, if all meltable things are water) and the form and the substance, which is the end of their coming to be.

[6] By metaphorical transference from this case every substance in general is said to be a nature, because the nature of a thing is a sort of substance.

On the basis of what has been said, then, the thing that is said to be nature in the primary and full way is the substance of things that

have a starting-point of movement within themselves, insofar as they are themselves. For the matter is said to be nature because it is receptive of this, and comings to be and growing because they are movements arising from it. The starting-point of change for the beings that are by nature, which is in some way a component of them, either potentially or actually, is also this.

Δ 5

Something is said to be NECESSARY: [1a] If it is that without which, as a contributing cause, living is impossible—for example, breathing and nourishment are necessary for an animal, since it cannot exist without these. [1b] Also, if it is anything without which it is not possible for the good to be or come to be, or for the bad to be got rid of or taken away—for example, drinking the medicine is necessary in order not to be sick, as is sailing to Aegina in order to get the money. [2] Further, if it is forced or is force (that is, what is contrary to the impulse or the deliberate choice impedes or tends to hinder). For what is forced is said to be necessary, which is why it is also painful (as Evenus says, "every necessary thing, indeed, has a troublesome nature") and force is a kind of necessity (as Sophocles says, "but force necessitates that I do this").[501] And it seems that necessity is something that cannot be persuaded, and correctly so, since it is contrary to the movement that is in accord with deliberate choice and in accord with rational calculation.[502]

[3] Further, we say that it is necessary for what does not admit of being otherwise to be the way it is. And it is in accord with this sort of necessity that all the others are in some way said to be necessary. For what is forced is said to be necessary either to do or to suffer, when it is not possible to follow impulse because of what is doing the forcing—implying that necessity is that because of which it is not possible for a thing to be otherwise. And similarly in the case of the contributing causes of living and the good, since when in the one case the good, and in the other case living and being, are not possible without certain things, those things are necessary and that cause is a sort of necessity. Further, demonstration is among the things that are necessary, because it is not possible for something to be otherwise if it has been demonstrated unconditionally. The cause of this is the primary things, if the things from which deduction proceeds cannot be otherwise.[503]

Of some things, then, another thing is the cause of their being necessary, of others nothing is such a cause, rather, because of them other things are necessary. And so the necessary in the primary and full way

is the simple.[504] For it is not possible that this should be in more than one state, or even to be both in one state *and* another, since it would thereby be in more than one state.[505] Hence if there are certain things that are eternal and immovable, there is nothing forced or contrary to nature in them.[506]

Δ 6

Things are said to be ONE either coincidentally or intrinsically: [1] Coincidentally—for example, Coriscus, the musical, and musical Coriscus are one (for it is the same thing to say "Coriscus," "the musical," and "musical Coriscus"), and the musical, the just, and musical and just Coriscus are one.[507] For all these are said to be one coincidentally, the just and the musical, because they coincide with one substance, the musical and Coriscus, because one coincides with the other. Similarly, the musical Coriscus is in a way one with Coriscus, because one of the parts in the account coincides with the other—for example, the musical with Coriscus.[508] And musical Coriscus is in a way one with just Coriscus, because a part of each coincides with one and the same thing. The case is similar if the coincident is said of the genus or of the names of something universal—for example, that a human and a musical human are [one and] the same. For it is either because the musical coincides with the human, who is one substance, or because each of the two coincide with some particular thing—for example, Coriscus. Except they do not both belong to him in the same way, but human presumably does so as genus and included in the substance, whereas musical does so as a state or attribute of the substance.[509] Things that are said to be one coincidentally, then, are said to be so in this way.

[2a] Of things said to be one intrinsically, some are said to be so because they are continuous—for example, a bundle [is one] because of being tied together, and pieces of wood, because of being glued together.[510] And a line, even if bent, is said to be one if it is continuous, as is each part—for example, a leg or an arm. Of these themselves, the continuous by nature are more one than the continuous by craft. A thing is said to be continuous when its movement is intrinsically one and cannot be otherwise, and a movement is one when it is indivisible, and indivisible with respect to time. And things are intrinsically continuous when they are one but not by contact. For if you place pieces of wood so that they make contact with each other, you will not say that these are one piece of wood, or one body, or one whatever else that is continuous. Continuous things in general, then, are said to be

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