

Epistemology after Protagoras: Responses to Relativism in Plato, Aristotle, and Democritus

Mi-Kyoung Lee

https://doi.org/10.1093/0199262225.001.0001

Published online: 01 October 2005 **Published in print:** 24 February 2005 **Online ISBN:** 9780191602924

Print ISBN: 9780199262229

Search in this book

CHAPTER

8 Democritus on appearances and perception: the early sources

Mi-Kyoung Lee

https://doi.org/10.1093/0199262225.003.0008 Pages 181–216

Published: February 2005

Abstract

Democritus rejects the thesis that all beliefs are true, but accepts the idea that things are for each as one's senses tell one. Thus, he gives some sense of what a more and nuanced developed version of Protagorean ideas about perception would look like, one that anticipates Epicurus' slogan that 'all perceptions are true.' This chapter examines the early sources for Democritus' epistemological views, especially Theophrastus, who preserves for us Democritus' theory of perception and sensible properties.

Keywords: sensible qualities, perception, senses, relativity, subjective, appearances, explanation, aitiologia, vision

Subject: Epistemology, Ancient Philosophy

Collection: Oxford Scholarship Online

> The earlier philosophers of nature did not state the matter well, thinking that there is without sight nothing white nor black, nor flavour without tasting.
>
> (Aristotle, *De Anima* III 2. 426^{a}20–3)

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

8.1 Introduction to Democritus[1]

If there was a close contemporary of Plato′s and Aristotle′s who most exemplified the Protagorean ideas they examine and criticize in the *Theaetetus* and in *Metaphysics* Γ5, it would be Democritus, or so I shall argue in this and the next chapter. There are of course major differences between Protagoras and Democritus; Democritus was no relativist, and he is known to have argued against Protagoras′ *Alētheia*. But he seems to have subscribed to a number of ideas that Plato and Aristotle associate with Protagoras. For example, his way of thinking about the senses and sensible qualities is deeply Protagorean, and he made use of Protagoras′ argument from conflicting appearances to argue that nothing is sweet unless it seems so to someone. He also argued that the senses must be viewed as a *kanōn* or ‘standard’—that is, a measure in Protagoras′ language—without which knowledge is not possible. In this chapter and the next, we will explore these Protagorean aspects of Democritus′ epistemology, which will help to sharpen our sense of the diversity of ideas being explored by philosophers in late classical, fourth-century Greece.

p. 182 Democritus and Protagoras are not usually discussed on the same page. Protagoras is a Sophist and an orator; in histories of ancient Greek thought, he is usually put in the chapters on rhetoric or on Plato′s response to the Sophists. Democritus is classified as one of the last of the Presocratic philosophers, an atomist who responded to Parmenides′ arguments concerning being, but whose mode of philosophy hearkens back to the Milesian tradition of monism. They are thought to differ in method (sophistry vs. philosophy), interests (rhetoric vs. science), and goals (persuasion vs. truth). But such neat categories can be limiting for those wishing to understand their ideas and influence. As we have seen, Protagoras′ *Truth* contained epistemological arguments that issue a powerful challenge to realist and objectivist assumptions in philosophy; Protagoras was also concerned with topics of philosophical significance in politics, education, and religion. Democritus was not only a *physiologos*; he also wrote numerous books on ethics, political philosophy, grammar, rhetoric, and music (DL IX 46–9). For this reason, it has been said that if Protagoras was the most philosophical of the sophists, Democritus was the most sophistical of the Presocratics.[2]

According to ancient tradition, both Protagoras and Democritus came from Abdera in Thrace, on the north-western coast of the Aegean. Though it is difficult to establish their dates with certainty, given the unreliable state of the doxographic tradition for pre-Platonic philosophers, it seems that Protagoras lived from *c*.492 to 421[3] and that Democritus lived from *c*.460 to 356,[4] which makes Democritus approximately twenty-five years younger than Protagoras. There is, however, a biographical tradition which makes Democritus older than Protagoras, and Protagoras a protégé of Democritus; Protagoras is said to have originally been a wood-porter, who came to Democritus′ attention because he was using a particularly ingenious shoulder-pad, τύλη, for carrying wood.[5] These reports are impossible; Plato says in the *Meno* (91de = DK 80 A8) that Protagoras was famous throughout Greece for forty years, and that he was 70 when he died, but Democritus cannot have been
p. 183 teaching between 465 and 455, let alone earlier.[6] But these stories may be part of the reason why ancient ↳ biographers tend to classify Protagoras as a member of the ‘school of Democritus′, such as we find in the arrangement of Diogenes Laertius’ *Lives of the Ancient Philosophers*, where Leucippus[7] and Democritus come first, followed by Protagoras, Pyrrho, Timon, and Epicurus. J. A. Davison (1953) argues that attempts to make Democritus older than Protagoras are also responsible for the tradition according to which Democritus lived 104 years; he thinks it is more plausible that Democritus died *c*.396 at the age of 64.[8]

We cannot be very sure about Protagoras′ and Democritus′ exact dates; what is important for us is that it is legitimate to see Democritus as the later figure reacting to Protagoras. We know that Democritus knew of and responded to Protagoras′ measure doctrine. Sextus Empiricus reports:

> One could not say that every appearance is true, since this leads to self-refutation, as Democritus and Plato taught in opposition to Protagoras. For if every appearance is true, then that not every

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

> appearance is true, which is itself an appearance, will also be true, and so it will become false that every appearance is true. (*M* VII. 389–90 = A114/T181)

Plutarch describes a similar argument:

> The first charge Colotes makes against him [Democritus] is that by saying that each thing is no more of one kind than another he has thrown life into confusion. But Democritus was so far from thinking that each thing is no more of one kind than another that he opposed the sophist Protagoras for saying just that and wrote many persuasive arguments against him. (*Against Colotes* 4, 1108f = B156/T178c)

There is no corresponding evidence or testimony that Protagoras responded to or knew of Democritus.

By comparison with Protagoras—and indeed by comparison with the other Presocratic philosophers—
p. 184 Democritus wrote in unprecedented amounts, in all ↳ areas of philosophy, including physics, biology, epistemology, mathematics, astronomy, music and poetry, ethics, politics, medicine, and anthropology. Whereas most of the Presocratics wrote only one or two books or poems, Democritus wrote over seventy books, according to Thrasyllus' catalogue (DL IX 45–9 = A33/T40)—an output only matched in the classical period by Plato and Aristotle. It is useful to keep in mind that Democritus was not really a Presocratic but a contemporary of Socrates' who may have lived well into the fourth century. The volume of his writing was accompanied by a corresponding increase in sophistication and theoretical detail, as Aristotle and Theophrastus attest. But history has been particularly cruel to Democritus; only fragments of his writings remain, and as a proportion of his total output, less remains for him than for the others. We do not possess a single complete book or piece of writing; indeed, we do not even have a significant continuous excerpt from any of his writings.[9] Most of what remains are unconnected one-liners or brief statements in ethics, and these only hint at the larger outlines of whatever ethical theory he had. For other areas of his work, such as his atomist physics and science, we are almost completely dependent on the testimony of ancient philosophers and doxographers of a later generation. And they give us few clues as to the overall shape and argumentative structure of his philosophical treatises. We simply have no idea how Democritus typically began, ended, and organized his treatises, or what the announced aims and methods of his books were.

Despite the fact that almost nothing remains of Democritus' writings, we should not underestimate his importance and influence in antiquity.[10] References to and discussions of Democritus' writings suggest that they were widely disseminated, and that it was still possible to read them in the original at least up to the first century AD, and possibly as late as the fourth century.[11] Cicero ranks him above Chrysippus and Cleanthes;[12]
p. 185 Seneca, Philodemus, and ↳ others lavish praise on him, describing him for example as 'the most learned about nature of all the ancients'.[13] He was also regarded as one of the most foremost stylists of the period, singled out by Dionysius of Halicarnassus, Plutarch, and Cicero, for the clarity of his thought and expression.[14] Plato notoriously fails to mention Democritus in his writings[15]—a fact which need not be construed in a sinister way.[16] But Aristotle regularly mentions and discusses Democritus.[17] For example, in *On Generation and Corruption*, Aristotle singles Democritus out for praise:

> In general, no one has discussed these matters [i.e., the conditions of coming to be and passing away] other than superficially, with the exception of Democritus. He seems not merely to have thought about them all, but to differ from the rest in his approach. (*GC* I 2. $315^{a}34$ = A35/T42a)

Aristotle, Theophrastus, Heracleides Ponticus, Epicurus, his pupil Metrodorus of Lampsacus (*c*.331–278), the Stoics Cleanthes (*c*.331–232), and possibly Sphairos of Bosphorus (mid- to late third century BC), are all said to have written books on Democritus.[18] At the same time, there seems to have been persistent confusion even in antiquity concerning basic facts about Democritus and Leucippus, who is thought to have been Democritus' predecessor and perhaps his teacher. Epicurus denied that Leucippus existed, and there is confusion for example about whether the *Megas Diakosmos* was by Leucippus or Democritus. This, and the ultimate loss of

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

their books, was perhaps due, as Schmid–Stählin suggest, to the lack of an organized school of successors in
p. 186 Abdera. Certainly the Epicureans do not seem to have felt any responsibility for ↳ preserving Democritus' writings—and in this, they were perhaps encouraged by Epicurus' own denials that he owed anything to Democritus.[19]

Ancient traditions of biography connect at least two major schools with Democritus: the Epicureans and the Pyrrhonist sceptics. The histories of these schools, set out in the form of 'successions' or intellectual genealogies purporting to establish student–teacher relationships,[20] are themselves intertwined and converge not only on Democritus but also on Pyrrho (*c*.365 to 270),[21] the latter of whom was adopted by Aenesidemus two centuries later as the forefather of his brand of scepticism. Ancient intellectual genealogies constructed by philosophical schools are not entirely reliable, subject as they are to the whims of ancient biographers (for one thing, it is never clear what is required for one person to qualify as a 'teacher' or 'student' of another) as well as to attempts by later thinkers to establish an intellectual pedigree for themselves. For this reason, they are less useful for establishing a connection between Democritus and the later Hellenistic schools, the Epicureans and the Pyrrhonists. But they are perhaps more reliable when they report that there was a group of late fourth-century philosophers who were influenced by Democritus and exercised some influence, in turn, on Pyrrho and Epicurus. Democritus is said to have taught Metrodorus of Chios, a fourth-century atomist with sceptical tendencies.[22] Metrodorus, in turn, is said to have given Pyrrho 'bad beginnings'; Pyrrho and Anaxarchus of Abdera, another fourth-century atomist, are said to have travelled together on Alexander's expedition to India.[23] Aristocles reports that Pyrrho was a student of Anaxarchus, and later encountered Democritus' books.[24] Pyrrho is reported by his associate Philo to have 'mentioned Democritus most often' (DL IX 67 = T195).[25] Pyrrho in turn is said to have been the teacher of the atomist Nausiphanes of Teos (b. *c*.360 BC), who was the teacher of Epicurus.[26]

Democritus was also taken up by other schools. He was associated with the Pythagoreans,[27] which is why
p. 187 Thrasyllus, a Pythagorean and the court astrologer ↳ of the Emperor Tiberius in the first century AD, took such an interest in Democritus, compiling a catalogue of Democritus' books, organized in tetralogies like the more famous catalogue he compiled for Plato's books.[28] It is also the reason why Iamblichus included in his *Protrepticus* the treatise of the Anonymus Iamblichi, who as we noted earlier was probably a follower of Democritus. Democritus also seems to have been read by ancient medical doctors; some works in the Hippocratic corpus may perhaps show signs of his influence and ideas.[29] It has been argued that the Cynics were champions of Democritus and responsible for the preservation and state of the ethical fragments as we have them, on the grounds that the fragments closely resemble in wording and spirit some of their central doctrines.[30] And finally, despite the fact that Democritus famously said 'For I came to Athens and no one knew me' (DL IX 36 = B116/TD1; also in Cicero, *Tusculan Disputations* V.36.104), there is evidence that his ethical and political works were eventually read by the late fifth or early fourth century in Athens: the text of the Anonymus Iamblichi, mentioned above, appears to be an Athenian document from that period heavily influenced by Democritus' political theory.

We must therefore reconstruct Democritus' views about knowledge and perception from the testimony of sources both roughly contemporary with Democritus and late. We will proceed by examining each piece of testimony, keeping in mind the interest the witness has in Democritus, whether critical or sympathetic, with the hope of being able to trace lines of convergence from these testimonies back to the original source. If we can give a plausible explanation of why later thinkers emphasized certain aspects of Democritus' views as opposed to others, this will give us indirect confirmation that we are proceeding along the right lines.

The testimony concerning Democritus' views about knowledge can be divided into roughly two groups. First, Aristotle and Theophrastus are early sources. They do not address the subject of Democritus' epistemology directly. We want to investigate Aristotle's remarks that Democritus thought that 'truth lies in appearing', or that appearances are true, and his reasons for associating Democritus with Protagoras. Theophrastus is valuable for his testimony concerning Democritus' theories of perception and sensible qualities. Second, we

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

p. 188 have testimony from later Epicurean and sceptical traditions which make Democritus ↳ into a so-called negative dogmatist, someone who thought that no appearances are true and that the truth is impossible for human beings to discover.[31]

Despite the apparent differences between them, one cannot favour one set of testimony over the other, for each set contains elements with affinities with the other set. For example, Aristotle, like the Epicureans, gives evidence of a 'sceptical' Democritus: 'And this is why Democritus, at any rate, says that either there is no truth or to us at least it is not evident' (*Met*. Γ5. 1009^{b}11–12). And his testimony should not be dismissed out of hand, for when interpreted in the light of other testimony and fragments from Democritus, we can discern the fundamental epistemological principles Aristotle thinks characterize Democritus′ thinking.[32] Nor are the late sources—or the early ones—free from tensions. In some passages, Sextus Empiricus presents Democritus as a negative dogmatist who denies that anything is true, but elsewhere he denies that Democritus was a sceptic of any kind, since he makes both reason and the senses sources of knowledge and criteria of the truth. We will proceed on the assumption that Aristotle, Sextus, and the others may be describing different aspects of a single coherent theory; we will discuss Aristotle and Theophrastus in this chapter, and the later sources in Chapter 9.

From our study of the sources, we will arrive at the following picture of Democritus′ epistemology. It will be useful to keep this in mind in this and the next chapter since we will be examining the sources one by one; the pieces of the puzzle will not become clear until the end. Democritus rejected Protagoras′ measure doctrine; he was no subjectivist or relativist, and did not think that all opinions and beliefs are true. As I shall argue, the reason why Aristotle describes him in Protagorean terms, and finds connections between his view and Protagoras′ is that Democritus was indeed a Protagorean about perception and sensible qualities; on his view, one cannot go wrong in perception, because what we perceive are the effects which atoms have on us. But this
p. 189 implies that there is a gap between objects out there and what we perceive; what we perceive is not ↳ the object in itself but the affection it produces in us, and this implies that we can never know how things are in themselves. This thought is expressed in Democritus′ 'sceptical' fragments that the later sceptics and Epicureans take a particular interest in. At the same time, Democritus thought that the senses are a *sine qua non* for knowledge about what is non-evident or unclear to us; knowledge about what is real, that is, atoms and void, is only arrived at through reasoning and inference about what the senses tell us. That is, knowledge is not possible without perception. If then Democritus endorsed a view of sensible qualities according to which things are sweet only if they seem sweet to someone, and if he was committed to the view that knowledge is not possible without the senses, then he held positions that make him a Protagorean, at least according to Plato and Aristotle′s lights, because he makes perception a measure of the truth.[33]

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

8.2 Aristotle: Democritus on appearances

Let us begin with Aristotle. His primary interest is in Democritus' atomist physics and his biology, with a few brief comments about Democritus' view of the soul and intellect. This does not add up to a coherent presentation of Democritus' views on knowledge. But in a number of places, Aristotle does describe Democritus in a way that echoes Protagoras. For example, when discussing his explanation of coming to be, passing away, and alteration in *De Generatione et Corruptione*, Aristotle praises him for going well beyond any of his other predecessors in attempting to explain 'the appearances', and even describes him as thinking that 'truth lies in appearing'. In related passages of the *Metaphysics* and *De Anima* (cf. §8.2, 8.3.3), Aristotle associates Democritus with Protagoras' conflicting appearances argument, and includes Democritus with others whose way of thinking commits them to Protagoras' thesis that all appearances are true. For this reason, any interpretation which makes Democritus a rationalist who rejected the senses as unreliable will tend to downplay and even dismiss Aristotle's testimony; similarly, any interpretation which makes Democritus a proto-empiricist who thought that sensory perception is the point of departure for all apprehension of what is hidden will tend to defend the reliability of Aristotle's testimony on this point. As it turns out, Aristotle is not the only source who attributes this epistemological principle to Democritus, and so we can understand and make use of Aristotle's testimony without having to rely uncritically on it.

p. 190 Let us turn first to the *De Generatione et Corruptione*. Though Aristotle does not directly address Democritus' epistemology, his testimony is extremely important, for he refers, in terms of praise, to an objective and a method that, in his view, sets Democritus (and Leucippus) apart from the earlier philosophers.

> In general, no one except Democritus has applied himself to any of these matters [sc. the conditions of coming to be, passing away, alteration and growth] in a more than superficial way. Democritus, however, does seem not only to have thought about all the problems, but also to be distinguished from the outset by his method. For, as we are saying, none of the philosophers made any definite statement about growth, except such as any amateur might have made. They said that things grow by the accession of like to like, but they did not proceed to explain the manner of this accession. Nor did they give any account of combination; and they neglected almost every single one of the remaining problems, offering no explanation, for example, of action or passion—how in natural actions one thing acts and the other undergoes action. Democritus and Leucippus, however, postulate shapes, and make alteration and coming-to-be result from them. They explain coming-to-be and passing-away by their dissociation and association, but alteration by their grouping and position. And since they thought that the truth lay in the appearance, and the appearances are conflicting and infinitely many, they made shapes infinite in number. Hence—owing to the changes of the compound—the same thing seems different to different people; it is transposed by a small additional ingredient, and appears utterly other by the transposition of a single constituent. For a tragedy and a comedy are both composed of the same letters. (*GC* I 2. $315^{a}35$–$^{b}15$ = A35, DK 67 A9/T42a, trans. Joachim with modifications)

Aristotle describes Democritus as aiming to preserve and explain appearances: he and Leucippus 'thought that the truth lay in the appearance, and the appearances are conflicting and infinitely many', and they introduced an infinite number of shapes in order to explain them. Democritus tried to explain the appearances of substantial and qualitative change—that is, why objects appear to come into or out of existence or to undergo alteration and growth—in terms of fundamental atomic shapes that can be arranged and rearranged.[34]

In *GC* I 8, Aristotle again emphasizes the importance for Leucippus and Democritus of explaining why things appear to come to be, pass away, and undergo change.[35]

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

> The most systematic and general theory [sc. of the nature of change] was proposed by Leucippus and Democritus, taking as their starting-point the actual nature of things. For some of the older philosophers thought that what is is necessarily one and motionless; for the void is not, and there could be no motion without a separate void, nor could there be many things if there were nothing to separate them.…As a result of these arguments they set perception aside, and disregarding it on the
p. 191 ground that one must follow reason ↳ they say that the universe is one and motionless, and, some of them add, infinite; for a limit would bound it against the void.…These things seem to follow logically, but in practice it seems near to madness to think like this; for no madman is so crazy as to think that fire and ice are one and the same, but it is only in the case of what is good and what customarily seems so that some people are mad enough to think that there is no difference between them.
>
> But Leucippus thought that he had a theory which would grant to perception what is generally agreed, and would not do away with coming to be or passing away or motion or the plurality of things. In those respects he agreed with what seems to be the case, but to those who proposed the theory of the One he agreed that there can be no motion without void, and said that the void is not, and that nothing that there is is not; for what really is is a total plenum. (*GC* I 8. $324^{b}35$–$325^{a}29$ = DK 67 A7/T48a)

Aristotle describes Leucippus and Democritus as 'granting to perception what is generally agreed', as 'agreeing with what seems to be the case', and as thinking that 'truth lay in appearances'. This is perhaps misleading—as Hirzel (1877–83: i. 113) puts it, he makes it sound as though Democritus made sensory perception not the point of departure on the way to truth, but the locus of truth itself—but Aristotle clearly does not mean that Leucippus and Democritus thought that all opinions or appearances are true. Rather, his point is that they wished to show how ordinary pre-theoretic opinions and observations—such as the observation that things come into existence, pass away, and undergo alteration—can be explained by 'the actual nature of things' as described by the atomist theory. Unlike their predecessors, Leucippus and Democritus did not deny that there is any truth to how things ordinarily appear to us; on the contrary, they took appearances seriously enough to offer a theory to explain why things are the way they appear.

What sets Leucippus' and Democritus' method and aims apart, according to Aristotle, is that they thought that appearances require explanation. Given such a goal, a theory is only as good as its ability to explain those appearances. As we shall see, Democritus' explanations have the form: given that we observe *x* occurring, what is it about the world that could explain why *x* occurs? For example, given that we experience perceptions of various kinds, how can we explain the causal origins of those perceptions? In other words, Democritus' explanations are abductive, that is, inferences to the best explanation: they move from the level of observation to the level of explanation and cause.

Democritus' search for explanations[36]—and the direction of explanation from what appears to what is hidden—is attested to by other sources:

> Δημόκριτος γοῦν αὐτός, ὥς φασιν, ἔλεγε βούλεσθαι μίαν εὑρεῖν αἰτιολογίαν ἢ τὴν Περσῶν οἱ βασιλείαν γενέσθαι.
>
> Democritus himself, so they say, said that he would rather discover a single explanation than acquire the kingdom of the Persians. (Eusebius *Praeparatio Evangelica* XIV.27.4, citing Dionysius of Alexandria = B118/TD2)

p. 192 Eusebius interprets this as an expression of the hopelessness of finding a single explanation and thinks it is of a piece with what he supposes to be Democritus' and Epicurus' denial of providence. However, this line from Democritus need not express any epistemic scepticism, but rather a commitment to the difficult quest for rigorous explanations: Democritus thinks that such discoveries are preferable to any other human goods, but that it is difficult and rare to find even one such explanation.

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

Democritus uses an unusual word *aitiologia* 'causal account' or 'explanation'.[37] Epicurus also uses this word, calling Democritus and Leucippus *aitiologēsantes* 'investigators of causes' before applying the term to the Epicureans themselves.

> ⟨οἱ⟩ δ' αἰτιολογήσαντες ἐξ ἀρχῆς ἱκανῶς καὶ οὐ μόνον τῶν προτέρων πολὺ διενέγκαντες, ἀλλὰ καὶ τῶν ὕστερον, πολλαπλασίως ἔλαθον ἑαυτούς, καίπερ ἐν πολλοῖς μεγάλοι, κουφίσαντες ἐν τῶι τὴν ἀνάγκην καὶ ταὐτόματον πάντα δύνασθαι.
>
> Those adequately giving an account of causes from the beginning, far surpassing not only their predecessors but their successors too in many ways, though they alleviated many great evils, failed to see what they were doing in making necessity and chance the cause of everything. (Epicurus fr. 34.30 Arrighetti = A69/T208)

Ancient biographers consistently emphasize Democritus' pursuit of explanations. Plutarch tells an anecdote about Democritus wishing to find out what the cause of the sweetness of a cucumber was; he asked the maidservant where she found the cucumber, and when told it was sweet because it had been in a jar with honey, he replies:

> 'You've ruined it,' he said, apparently in anger, 'but all the same I shall pursue the inquiry and investigate the cause' (καὶ οὐδὲν ἧττον ἐπιθήσομαι τῶι λόγωι καὶ ζητήσω τὴν αἰτίαν), as if the sweetness belonged naturally to the cucumber. (*Convivial Questions* I.10.2, 628b–d = A17a/T24)

Similarly, in Philodemus:

> Democritus, a man who was not only the most learned about nature (φυσιολογώτατος) of all the ancients but no less industrious than any other inquirer, says that music is more recent, and identifies its cause (τὴν αἰτίαν ἀποδίωσι), saying that it was not singled out by necessity, but arose as a result of plenty. (*On Music* Herc. papyrus 1497, col. XXXVI. 29–39 = B144/T213)

Thrasyllus' catalogue of Democritus' books contains numerous books on the causes (αἰτίαι) of things: *Celestial Causes*, *Causes in the Air*, *Terrestrial Causes*, *Causes of Fire and of the Things in Fire*, *Causes of Sounds*, *Causes of Seeds, Plants,* ↳ *and Fruits*, *Causes of Animals* in 3 books, *Miscellaneous Causes*, *Causes concerned with Things Seasonable and Unseasonable*, *Legal Causes and Effects* (or *Causes of Laws*, Νομικὰ αἴτια) (DL IX 45–9).[38] Finally, there is ample evidence of Democritus' pursuit of *aitiologia* in what remains of his scientific research. The testimony concerning his interests in biology, medicine, and atmospheric phenomena indicate a wide range of interests, and preserve collections of his observations and proposals for explaining them. In the *Generation of Animals*, Aristotle gives us some idea of Democritus' embryology, with references to his explanations of sex and the differentiation of male and female (*GA* 764^{a}6–^{b}20 = A143/T138^{a}), the formation of the animal in the uterus (*GA* 740^{a}33–^{b}1 = T136^{a} and *GA* 730^{a}13–14 = T137^{a}), birth defects (*GA* 769^{b} 30–6 = T140), and the formation of teeth (*GA* 788^{b}10–28, 789^{b}2–8 = T141). Guthrie's claim that 'the aims of the atomists were not those of empirical scientists' but rather designed to 'meet the Eleatic challenge' (1965: 455) is hard to square with the evidence attesting to Democritus' interests in empirical observation and explanation.

p. 193

To sum up, when Aristotle says in the *De Generatione et Corruptione* that Democritus and Leucippus thought that 'truth lay in appearing', or that they 'agreed with what seems to be the case', he does not mean to imply that they thought that all appearances and opinions are true. Rather, this is Aristotle's shorthand way of saying that they gave a central place to empirical observations and that the aim of their theorizing was to give causal explanations for the features of the world that we observe. This quest for *aitiologiai* is also attested in later sources and testimony concerning Democritus' scientific theorizing. Aristotle does not intend to imply that Democritus was a Protagorean subjectivist, but rather that Democritus had an empirically oriented

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

methodology, one in which the senses and perceptual experience are the starting point for any further investigations into the truth.

However, in related passages in the *De Anima* and in *Metaphysics* Γ5, Aristotle comes closer to saying that Democritus endorsed the Protagorean thesis that all appearances are true. (And in these contexts, he only refers to Democritus, not Leucippus.) In *Metaphysics* Γ5, he describes the conflicting appearances argument supporting Protagoras′ measure doctrine: things appear F to some, and not-F to others, but there seems to be no more reason to suppose that it is F than not-F. It comes as something of a surprise when he ends his description of Protagoras′ argument by paraphrasing Democritus:

> Ποῖα οὖν τούτων ἀληθῆ ἢ ψευδῆ, ἄδηλον οὐθὲν γὰρ μᾶλλον τάδε ἢ τάδε ἀληθῆ, ἀλλ᾽ ὁμοίως. Διὸ Δημόκριτος γέ φησιν ἢτοι οὐθὲν εἶναι ἀληθές ἢ ἡμῖν γ᾽ ἄδηλον.
>
> Which then of these [appearances] are true and which are false is not obvious; for the one set is no more true than the other, but both are alike. And this is why Democritus, at any ↳ rate, says that either there is no truth or to us at least it is not evident. (*Metaphysics* Γ5. 1009^{b}9–12 = A112/T177, trans. Ross)

p. 194

This confirms that Democritus made some use of Protagoras′ undecidability argument.[39] But what does it mean to say that ‘either there is no truth or to us at least it is not evident’? Did Democritus mean to endorse the first alternative, that nothing, or neither appearance, is true, or the second, that even if one appearance is true rather than the other, it is unclear to us? Nothing in the conflicting appearances argument Aristotle has just described would appear to justify the extreme conclusion that nothing, or neither appearance, is true; what is justified is the idea contained in the second clause ‘we cannot tell’, which modifies and softens the first with ‘or at least’ (ἢ …γε). The conflicting appearances argument concludes that one cannot tell whether things are F or not-F, and Aristotle evidently means to say that Democritus, like Protagoras, endorsed this by saying: which appearance is true, if any, is unclear to us. Unfortunately, Aristotle does not explain what further significance this conclusion may have had for Democritus, or what its context in Democritus′ writings might have been. (As we shall see, the argument and Democritus′ conclusion probably concern perceptual appearances—not all appearances and opinions in general.)

Aristotle goes on to say that virtually all of his predecessors were committed in one way or another to the idea that all perceptual appearances are true.

> ὅλως δὲ διὰ τὸ ὑπολαμβάνειν φρόνησιν μὲν τὴν αἴσθησιν, ταύτην δ᾽ εἶναι ἀλλοίωσιν, τὸ φαινόμενον κατὰ τὴν αἴσθησιν ἐξ ἀνάγκης ἀληθὲς εἶναί φασιν ἐκ τούτων γὰρ καὶ Ἐμπεδοκλῆς καὶ Δημόκριτος καὶ τῶν ἄλλων ὡς ἔπος εἰπεῖν ἕκαστος τοιαύταις δόξαις γεγένηται ἔνοχοι.
>
> And in general, it is because these thinkers suppose knowledge to be sensation, and this to be a physical alteration, that they say that what appears to our senses must be true; for it is for these reasons that both Empedocles and Democritus and, one may almost say, all the others have fallen victim to opinions of this sort. (*Met*. Γ5. 1009^{b}12–17)

Aristotle includes Democritus in his list here, though he does not go on to quote him. However, when he quotes Homer, he evidently has Democritus in mind (cf. §7.3.3). Now Democritus does in fact distinguish sense perception from other kinds of awareness and cognition—indeed, he may have been one of the earliest to do so. There is no evidence that he had technical terms for sense perception[40] and the reasoning faculty,[41] but so much has been lost that it is hard to say. But in fragment B11/TD22, Democritus distinguishes between ↳ *gnēsiē gnōmē* ‘genuine knowing’ and *skotiē gnōmē* ‘dark knowing’, where dark knowing consists of seeing, hearing, smell, taste, and touch, and genuine knowing concerns what is too fine for the senses to detect, that is, atoms and void. And in fragment B125/TD23, Democritus has the senses address φρήν, ‘mind’. In these passages,

p. 195

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

which we will discuss more closely in §9.2.2 and 9.4, Democritus evidently marks off the mind from the senses as a distinct cognitive power.

Aristotle does not deny this; his point is not that Democritus simply equated the functions of sensation and thinking. Rather, Aristotle is thinking about what an explanation of thinking ought to look like, and, in his view, Democritus' explanation of how thinking occurs looks too much like his explanation of perceiving (cf. §§7.3, 7.7). Let's take a look at Aristotle's reasons. In *Met*. Γ5, Aristotle quotes from Homer:

> φασὶ δὲ καὶ τὸν "Ομηρον ταύτην ἔχοντα φαίνεται τὴν δόξαν, ὅτι ἐποίησε τὸν Ἕκτορα, ὡς ἐξέστη ὑπὸ τῆς πληγῆς, κεῖσθαι ἀλλοφρονέοντα, ὡς φρονοῦντας μὲν καὶ τοὺς παραφρονοῦντας ἀλλ' οὐ ταὐτά.
>
> And they say that Homer also evidently had this opinion, because he made Hector, when he was unconscious from the blow, lie 'thinking other thoughts',—which implies that even those who are bereft of thought have thoughts, though not the same thoughts [sc. as those who are fully conscious]. (*Met*. Γ5. 1009^{b}28–31)

When Aristotle refers to some ('They say') who attribute this belief to Homer, he means Democritus.[42] We know this because both Theophrastus in the *De Sensibus* and Aristotle in the *De Anima* associate Democritus with this line from Homer. Theophrastus describes Democritus' view of thinking as follows:

> About thought (φρονεῖν), [Democritus] said merely that it occurs when the constituents of the soul are properly balanced (συμμέτρως); when one gets too hot or too cold, then he says change takes place (μεταλλάττειν). That is why it was a good idea of the ancients that one can 'think other things' (ἀλλοφρονεῖν). It is clear, therefore, that he explains thought by the constitution of the body, which is perhaps consistent on his part, since he makes the soul out to be a body. (*DS* 58 = A135/T113)

Theophrastus refers to Democritus' praise of 'the ancients' and uses the same unusual word *allophronein* to describe thinking when the body has been altered. We can infer that Democritus must have praised Homer for saying that when Hector (or Euryalus) suffered an alteration in temperature or proportion in ↳ the soul, he was 'thinking differently'; for, in Democritus' view, this correctly implies that thinking depends on the composition and condition of the body.[43] Similarly, in the *De Anima*, Aristotle tells us that Democritus approved of this line from Homer.

p. 196

> Anaxagoras too says that soul is the cause of motion, and so does anyone else who says that mind sets everything in motion; but that view is not exactly the same as that of Democritus. For he says that soul and mind are simply the same thing, for truth is what appears, which is why Homer was right to describe Hector as 'lying thinking other things'; he does not then treat the mind as a capacity to achieve the truth, but says that soul and mind are the same thing. (*DA* I 2. 404^{a}25–31 = A101/T107a)[44]

'Truth is what appears' and 'Soul and mind are the same' are not quotations from Democritus, but represent Aristotle's own inferences about Democritus.[45] In his view, Democritus' praise of the line from Homer implies that the condition of the body affects and indeed determines the content of one's thoughts; so understood, thinking is a passive condition in which the content of one's thought mirrors the cause, from which it follows that 'truth is what appears'. He describes Democritus as identifying soul and mind only because Democritus fails to distinguish between the two in the right way. For Aristotle thinks that it is necessary to distinguish the soul—i.e. that set of capacities in virtue of which an animal is alive—from the mind (*nous*), the capacity by which a living being grasps truth and is capable of thought. Democritus fails to do this, and assigns life functions and rational functions to the same thing:

> Democritus' explanation of either attribute [i.e. the soul's being a source of motion and the seat of intelligence] is more subtle [i.e. than that of his predecessors]. He says that the soul is the same as the

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

> mind, and is composed of the primary, invisible bodies, and is a source of motion because of their smallness and shape. He says that the sphere is the most mobile of shapes, and that mind and fire are of the same nature. (*DA* I 2. 405[a]8–13 = A101/T107b)

Spherical atoms, whose shape makes them the most mobile of all shapes and which are of the same nature as
p. 197 the atoms in fire, are responsible both for animating the body—that is, for life—and for activating thought in ↳ that body—that is, for intellect. The fact that spherical atoms have both functions explains why Aristotle describes Democritus as identifying the soul with the mind.

According to Lucretius and Sextus, Democritus thought the mind is scattered throughout the body.[46]

> Some say that it [i.e. thought] occurs throughout the whole body, e.g. some people who follow Democritus. (Sextus *M* VII 349 = A107/T110e)
>
> On this point you could not accept what the holy opinion of the man Democritus lays down, that the elements of body and mind are disposed alternately, one by one, and so bind the limbs together. (Lucretius III.370–4 = A108/T110f)

Taylor argues that Lucretius' testimony is particularly important, because in arguing for the Epicurean distinction between the *animus* 'intellect' in the chest and the *anima* or non-rational soul which is distributed throughout the body, Lucretius expressly criticizes other views, including Democritus', according to which the atoms making up the *animus* are distributed throughout the body alternately with those making up the bodily organs and limbs. This implies not only that the mind is not located in any particular part of the body—*pace* Aëtius—but also that 'mind-atoms are not some subset of soul-atoms; rather the living human being is composed of an interconnected web of mind-atoms and body-atoms, matched one to one. Clearly, soul-atoms and mind-atoms are the same set of atoms' (Taylor 1999*a*: 202).

Now if Democritus thought that the same atoms animate the living being and are responsible for thinking and perceiving, it would help to explain why he maintained according to some reports that even the dead may feel something. Since life is determined by the presence of soul-atoms in the larger mass of atoms making up the body, being alive is not an all-or-nothing affair, as Proclus explains:

> Stories of people who appeared to have died and then came back to life were collected by many of the ancients including the scientist Democritus in his writings On Hades….Death was not, as it seemed to be, the extinction of all life in the body, but it was driven out perhaps by a blow or an injury, while some links with the soul were left still rooted in the region of the marrow and the heart retained some
> p. 198 sparks of life hidden in its ↳ inmost regions. And as these remained intact the body was still adapted for life and subsequently regained the life which had been extinguished. (*Commentary on Plato's Republic* II.113.6 Kroll = B1/T112d)[47]

After the cessation of respiration, parts of the soul (that is, spherical atoms) may still be left in the body and their continuing presence allow it to be resuscitated. This is not only true in the case of those who are apparently dead, but also for those who have suffered a blow. Hence the significance of the quotation from Homer: even mid-swoon, it is possible to feel and think, although perhaps not the same feelings and thoughts as when one is fully conscious.[48]

Furthermore, Democritus evidently thought that thinking occurs in the same way as perceiving: in both cases, images or *eidōla* stream off from objects and strike the sensory- or mind-atoms in the body. Thus, when I think of sunshine in Las Palmas, I must have obtained that thought by being directly affected by thought-images of the sunshine in Las Palmas. This may seem too crude to be tenable, but Lucretius offers a similar explanation, and explicitly makes the point that thinking and perceiving must occur in the same way:

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

> Because…[the images′] extreme lightness makes their travel so mobile, it is easy for any one fine image to arouse our mind with a single impact. For the mind is itself delicate and extraordinarily mobile. That this happens as I say it does you can easily tell as follows. In so far as what we see with the mind is similar to what we see with the eyes, it must come about in a similar way. Well, since I have proved that it is by means of whatever images stimulate my eyes that I see, say, a lion, you can now tell that the mind is moved in a similar way through images of lions and equally through the others it sees, no less than the eyes except in that what it discerns is more delicate. (*De rerum natura* 4.779 ff. = LS 15D, trans. Long and Sedley)

According to this Epicurean theory of thought, one thinks of something by means of *eidōla* or 'spectres' that constantly stream off from objects and possess the same shapes that those objects do. As Lucretius puts it, we see with the mind in the same way that we see with the eyes; in both cases, the mind or sense-organ is moved by images which reach it from outside, and constitute the object of one′s thought or perception. Cicero finds this explanation of thinking absurd:

> You must explain it [sc. the Epicurean explanation of thinking] to me when you come safe home, so that I can have your spectre in my power, so that it presents itself as soon as I want to think of you,
p. 199 and not only of you, whom I have in my heart, but if I begin to ↳ think of the island of Britain, its *eidōlon* will come flying into my chest. (*Ad familiares* XV.16.1 = A118/T131a)

He finds it implausible that the content of one′s thoughts, no less than the content of one′s perceptions, should be determined by the *eidōla* or 'spectres' that strike one′s body, that every mental content should be the effect of the impact of these images on the mind.[49] And he clearly lays responsibility for this theory on Democritus (*De Natura Deorum* I.38.105–10 = not in DK/T131b).

If Cicero is correct, then it helps to explain why Aristotle includes Democritus among the philosophers whose explanations of thinking commit them—or so he thinks—to the impossibility of error (cf. §7.7). For, on Democritus′ view, there is a one-to-one correspondence between what one thinks (for example, Cicero thinking of the island of Britain) and what causes one to think (the *eidōla* of Britain flying towards and into Cicero′s mind). This certainly does not imply that Democritus himself endorsed the position that error is impossible and that all opinions are true. Rather, it is a criticism of Democritus′ explanation of thinking, according to which, in attempting to explain how we come to have certain mental contents and think certain thoughts, he ends up explaining too much, and makes it impossible for us to think about nothing, so to speak, that is, about what is not really the case.

It is clear that Aristotle can only take us so far in our investigation into Democritus′ epistemology, into his views of knowledge and perception; this is not an aspect of Democritus′ thinking which occupied his attention. As we have seen, he does not attempt to characterize in general terms Democritus′ epistemology; furthermore, some of his remarks about Democritus (for example, 'truth lies in the appearances') are so cryptic as to be potentially misleading. But if we keep in mind the particular nature of Aristotle′s interests in Democritus, we find that he offers a number of clues about the nature of Democritus′ views about appearances, perception, and knowledge. First, Aristotle confirms that, in *Metaphysics* Γ5, Democritus made use of Protagoras′ argument from conflicting appearances, concluding that 'either there is no truth or to us at least it is not evident'. The meaning of this is still not clear; we will have to turn to other sources in order to determine what conclusions Democritus drew from the argument from conflicting appearances. Second, Aristotle sometimes describes Democritus as making appearances true. He evidently means by this different things in different contexts. (i) In *On Generation and Corruption*, Aristotle describes Leucippus and Democritus favourably, as driven by the
p. 200 desire to discover explanations for why things appear to us as they do. Other sources ↳ besides Aristotle attest to the importance for Democritus of the search for *aitiologiai*, causal explanations of observable phenomena. Aristotle sums this up with the slogan 'truth lies in appearing', which in fact means: appearances are the starting point for any investigation into the truth. We will return to this important principle in Chapter 9. (ii) In

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

the *De Anima*, Aristotle says that Democritus identifies the intellect with the soul, which implies that all appearances are true. With some care, we can unpack these cryptic statements by seeing that, from Aristotle's perspective, Democritus has failed to distinguish between life-functions and intellectual functions in the right way. That is, he means to criticize the way Democritus assigns life functions and rational functions to the same soul/mind-atoms, and the way he explains thinking on the same model as perceiving. For this reason, Democritus clearly exemplifies, for Aristotle, the Protagorean model of thinking Aristotle rejects in *Metaphysics* Γ5 and *DA* III 3.

8.3 Theophrastus on Democritus

Theophrastus, who was Aristotle's student and successor as head of the Lyceum, is, next to Sextus Empiricus, our most important source for Democritus' epistemology. He gives us far more details about Democritus' views about perception and sensible qualities than any other source, and seems to have consulted Democritus' books first-hand. Furthermore, he is a pre-Epicurean witness to Democritus' views, which ensures that any resemblance between Democritus' theories as he describes them and Epicurus' is not the result of his having assimilated the former to the latter. Finally, of all the sources, he gives us the best sense of the reasons for Democritus' attack on the senses, an issue which will be crucial for our reconstruction of Democritus' epistemology in Chapter 9 (see especially §9.2.1).

Theophrastus discusses Democritus' theory of perception in his *De Sensibus* 'On the Senses' which is a review and critique of pre-Aristotelian theories of the senses and of sensible qualities. The *De Sensibus* was thought by Diels to be a fragment of a larger, now lost work *Physikōn doxai* 'Opinions of the Physicists', which apparently set out the views of earlier thinkers on various topics in physics and natural philosophy;[50] more recently, it has been suggested that it was part of a systematic work of Theophrastus' on sense perception, or that it may have been a stand-alone work, a critical exercise and prolegomena for future work on the topic.[51] In any case, the *De*
p. 201 *Sensibus* bears the stamp of the author's teacher. ↳ Its basic themes—such as the idea that theories of perception are either like-by-like or by alteration—are familiar from Aristotle's *De Anima*, as are many of its criticisms. It also makes exemplary use of Aristotle's dialectical method. For it is not organized chronologically, but systematically, to display the sharpest contrast between the thinkers discussed; the intent is not simply to record various thinkers' views on a subject, but to learn something from examining them critically, determining what they got wrong and what they got right, and to discern the trajectory of intellectual progress in them.[52] In the *De Sensibus*, Theophrastus is not curating a museum exhibit of philosophical opinions or compiling a handbook; he seems to assume that the texts he consults are already known and available to his readers. Thus, for example, he does not refer to books or their titles, and he makes no attempt to give an exhaustive account of a person's views.

The *De Sensibus*' strengths and failings from a purely doxographical point of view can be partly measured because we happen to possess Plato's own presentation of his theory of sensible qualities in the *Timaeus*. If Theophrastus does a good job in describing Plato's theory in the *DS*, we have some reason to expect that he is equally conscientious in his accounts of the others where no such control exists. As it happens, Theophrastus follows the *Timaeus* fairly closely, and sometimes quotes almost verbatim from it. Granted, there are enough discrepancies between his description of Plato's views and the *Timaeus* to suggest that his reports of other philosophers are not always comprehensive and may sometimes be misleading.[53] But again this is partly because he is not a doxographer or historian in the strict sense—he is not writing a handbook for those who lack the original text or a summary of opinions, but seems to be motivated by the desire to ascertain the original and derivative aspects of each theory, and to determine which philosophers made the best progress in understanding the nature of perception and the sensible qualities. Theophrastus is undoubtedly superior to most other sources for the Presocratics, and is generally more careful than Aristotle: he quotes more than
p. 202 Aristotle does; he takes greater pains to describe a view objectively and in detail; he clearly ↳ separates what a

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

person says from his own hermeneutical paraphrases and criticisms.[54] In all this he is unlike Aristotle whose criticisms, as we saw earlier, are sometimes so compressed that it is hard to distinguish what a thinker's view was from Aristotle's description of what he believes are the attendant problems or difficulties for that view.

8.3.1 Theophrastus on Democritus' theory of perception

We will begin by examining Theophrastus' account of Democritus' theory of vision in order to get some sense of Democritus' way of explaining perception in general. Theophrastus offers the following detailed account of Democritus' theory of vision.

> He makes sight occur by means of the image; his account of this is original, for he says that the image is not immediately produced in the eyeball, but the air between the sight and the thing seen is compacted by the seer and the thing seen and an impression is made on it, as everything is always giving off an effluence. This mass of air, which is solid and of a different colour, is then imaged in the eyes, which are moist; a dense body does not take the image, but a moist one lets it pass through. That is why moist eyes are better at seeing than hard ones, provided that the outer coating is as fine as possible, and the inside as porous as possible without any dense, strong flesh or thick, greasy liquid, and the veins in the region of the eyes are straight and free of moisture, so that they match the shape of the impressions; for everything most readily recognizes things of the same kind as itself. (*DS* 50 = A135/T113)[55]

According to Theophrastus, vision occurs, for Democritus, by means of an *emphasis* in the eye.[56] *Emphainesthai* means 'appear or be visible in', and an *emphasis* is, literally, an 'appearing in'; it usually refers to the phenomenon of something appearing in reflective surfaces like mirrors or water (e.g. Plato, *Ti.* 46b1). For this reason, the term is sometimes translated as 'reflection' (Guthrie 1965: 442) or 'mirroring' (Aristotle, *De Sensu* 438a6, trans. ROT). However, this implies something more than what Democritus has in mind,[57] for reflections appear in smooth surfaces to viewers looking at the surface, but Democritus evidently means to say that a person sees when an *emphasis* appears in her *own* eye, which itself has a smooth surface for taking those
p. 203 images. ↳ Thus, it is safer to translate *emphasis* more literally as 'appearance' (Burkert 1977) or 'image' (Taylor 1999*a*).

To judge from Theophrastus' account, Democritus posited at least three stages in the production of an *emphasis* in the eye. First, there is a constant stream of effluences consisting of thin layers of atoms emanating from every object.[58] Second, effluences make an image or impression on the air between the object and the eye. Air is the finest of all possible media, and can receive impressions of all kinds; here, we should think, as Walter Burkert (1977: 98) suggests, of sand in comparison with gravel. Air, like sand, must somehow be compacted and compressed between the object and the eye before it can take an impression:

> The thing on which the impression is made must be dense, and must not be scattered, as he himself says in comparing the making of this sort of impression to pressing something into wax. (*DS* 51 = A135/T113)

Once the mass of air has been compacted and the effluence makes an image or impression on it, that in turn is 'imaged' or appears in the eye. The eye, which is made out of water, can only take the image under certain conditions: ideally, the eye should have a fine external coating and not be too dense. As far as we can tell from Theophrastus' description—and no other source tells us as much as Theophrastus—Democritus had nothing more to say about what happens once the *emphasis* is produced in the eye, that is, about how an image's 'appearing' in the eye produces visual awareness in the perceiver.[59]

According to Theophrastus, the air-impressions were an innovation of Democritus', and in his critical comments, he concentrates on this aspect of the theory.[60] Why did Democritus introduce this intermediate

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

stage, instead of simply having effluvia from the object enter the eye directly? Theophrastus wonders about this himself (*DS* 51). The reason will turn out to be that ↳ Democritus thought that, as a matter of fact, air functions as an obstacle between the eye and the objects of vision.

Let us begin with his explanation that 'the air between the sight and the thing seen is compacted (συστελλόμενον) by the seer and the thing seen and an impression is made on it, (τυποῦσθαι), as everything is always giving off an effluence.'[61] This suggests that air plays an intermediate role in vision—as it does in the modern understanding of sound. So why does Aristotle criticize Democritus (among others) for failing to recognize the need for a medium in vision, such as 'the transparent' plays in his own theory?

> [In vision] colour brings about a change in the transparent medium, e.g. air, and the sense-organ is changed by the activity of this continuous medium. For Democritus was not correct to think that if the intervening space was empty one would see acutely enough to see even an ant in the heavens; that is impossible. (*De Anima* II 7. 419^{a}13–17 = A122/T118)

Isn't Democritus' air-impression just such a transparent medium for vision? The answer must be that Aristotle is aware of the function of air in Democritus' theory, but does not believe that air plays the role of a medium in the required sense. Aristotle wants (1) a transparent medium, not a medium-as-obstacle, (2) a sense-organ activated by the activity of that transparent medium, and (3) a theory of vision which does not make it a kind of sensing by contact. The activation of the medium requires the presence of light; this makes vision possible. By contrast, on Democritus' view, vision occurs purely through the impact of external atoms on the atoms that constitute the sense organ. This is why, from Aristotle's perspective, Democritus makes all the senses a form of touch (*De Sensu* 442^{a}29–^{b}1 = A119/T116). If, on Democritus' view, the air is more of an obstacle than a medium for vision, it helps to explain Aristotle's report that, according to Democritus, if the intervening space were empty, one would be able to see an ant in the heavens. Aristotle himself thinks the conditional is false because vision is impossible without a medium and hence impossible in empty space. Doesn't Aristotle's report conflict with Theophrastus' report about the role of air-imprints in Democritus' theory?[62] ↳ It does not, if, following Zeller, we take the conditional as a counterfactual:[63] if space were empty, we would be able to see an ant in the heavens, but as it is, we obviously cannot see that far, though we are certainly capable of seeing. Therefore, space must not be empty, but must contain something which interferes with long-distance vision, namely, air. Air does not play the role of an Aristotelian medium in Democritus' theory of vision, but is rather an obstacle; the challenge for Democritus was to explain how we can see in spite of the presence of air. The explanation he offered was that even if vision would be better in a void, it can still occur in air, as long as the air is compacted so that it can function as a vehicle for the image. Democritus is thus correctly described as making no use of a medium in Aristotle's sense of the word. Presumably he thought air is the cause of a number of different kinds of interference in vision, as is apparent when one attempts to see things far away, in fog, or in extreme heat which gives rise to mirages.

Now an important consequence of Democritus' theory is that we are not directly affected by the object or even by effluences of atoms originating from the object. Rather, as Theophrastus puts it, sight occurs by means of an 'image', and this image is formed in a mass of compacted air that intervenes between the object and eye, acts as a vehicle for the image, and is itself shaped by the object and the eye. This ontological distance between perceiver and object of perception can also be found in Democritus' account of hearing (Theophr. *DS* 55–6 = A135/T113). Hearing is a kind of internal affection which occurs by contact between condensed air and void in the body, especially in the ears, when those areas are dry and 'well-bored'. What strictly speaking affects us are the motions of condensed air which reach and penetrate the inner empty areas of the body, especially but not only the ear.

But if objects like tables and chairs do not affect our sense-organs directly, and only serve to initiate the causal chain of events that ultimately gives rise to the affection of the senses, we can ask: what exactly do we perceive when we see and hear? Do we see the mountain and hear the creek? Or do we only, strictly speaking, see the

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

atoms from the air-impressions that were formed from effluences from the mountains, and hear the air-movements that were set in motion by the creek and eventually reach the inner areas of the ear?[64] As we shall see in the next section, Democritus′ answer is even more surprising: strictly speaking, what we perceive is the effect which things have on our sense-organs. What we learn about through the senses is how the senses are affected, not anything about what the world is like or how things are in themselves. Thus, perception proves to be a disappointingly limited source of information about how things really are.

p. 206

8.3.2 Theophrastus on Democritus' theory of sensible qualities

We shall now turn to Theophrastus′ description of Democritus′ theory of sensible qualities. Theophrastus devotes his discussion of ancient theories of sensible qualities entirely to Democritus and Plato. The reason is that Democritus and Plato were, according to him, the first and only philosophers to develop a real theory of sensible qualities.[65] Theophrastus′ aim is both to ascertain how original each view was, and also to evaluate them critically. As he presents their views, Plato and Democritus each have a thesis about what sensible qualities are, the one opposite to the other, and each then proceeds to contradict himself. We will focus on this part of Theophrastus′ report—not simply on the alleged inconsistency, since it will become clear that the contradiction Theophrastus sees is only apparent, an artefact of his close and perhaps overly literal reading of the texts—but also on the valuable clues Theophrastus gives about Democritus′ views concerning the cognitive value and epistemic power of the senses.

For Theophrastus, the central question we must consider in thinking about sensible qualities is whether they are genuine properties of the objects to which they belong, or merely affections of the sense, produced by the interaction of an object on a sense organ. He finds answers in Plato and Democritus, which he presents as *hypotheseis* ‘assumptions’ (*DS* 60). Plato thinks that sensible qualities have their own nature, and ‘makes them out to be things in their own right’ (καθ’ αὑτὰ ποιῶν ταὶς οὐσίαις, *DS* 61). By contrast, Democritus denies that sensible qualities have their own nature; they are merely ‘affections of the sense’ (πάθη τῆς αἰσθήσεως, *DS* 61). However, each contradicts his own *hypothesis*: ‘Democritus makes them out to be affections of the sense but distinguishes them with respect to their own nature, while Plato makes them out to be things in their own right but ascribes them to affections of the sense’ (*DS* 60–1, trans. Taylor modified). That is, each says something general about the nature of sensible qualities, but contradicts it in the particular way he defines individual sensible qualities.

Now Theophrastus′ term *hypothesis* has to be taken with a grain of salt. In the *Timaeus*, Plato does not use this term to introduce his view of sensible qualities, nor does he explicitly offer a general definition of sensible qualities. What Theophrastus calls Plato′s *hypothesis* represents Theophrastus′ considered judgement about what Plato thinks: because Plato discusses sensible qualities (*Ti.* 61c–69a) right after he discusses primary bodies (which belongs to the section at *Ti.* 47–69 on what comes about of Necessity), Theophrastus understands Plato to mean that sensible qualities are basic properties of the primary bodies. Now,

p. 207

Theophrastus′ considered judgement is eminently worth listening to, ↳ but it is an interpretation, not a report. Indeed, his very distinction between a theory of sensible qualities and a theory of perception was probably not made by Plato or Democritus. Plato for one thinks it is not possible to discuss one without the other (*Ti.* 61cd); this is the reason why he is forced to discuss sense perception prematurely, in the section on Necessity, where he can discuss sensible qualities, although he has not yet introduced the soul–body complex, which comes later in the section on what is produced through the cooperation of Reason and Necessity (*Ti.* 69–92). Likewise, what Theophrastus describes as Democritus′ *hypothesis* about sensible qualities was I believe part of a discussion of the senses, which was perhaps separate from the book in which Democritus describes the particular sensible qualities like flavours and colours.[66]

We will eventually examine this purported *hypothesis* of Democritus. But first it will be useful to try to understand how he went about giving accounts of the particular sensible qualities. There seem to be at least

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

five factors he appealed to in explaining sensible qualities. Theophrastus introduces Democritus' accounts of particular sensible qualities by noting that Democritus 'differentiates some by size, some by shape, and some by order and arrangement' (*DS* 60). This is consistent with Aristotle's report that Democritus postulated a limitless variety in shapes of atoms in order to account for the limitless variety in appearances (*GC* I 2. 315^{b}6–15 = DK 67 A9/T42a; cf. §8.2). Thus, Democritus introduced (1) an infinite variety of shapes and sizes in order to explain the infinite variety of appearances.[67] Theophrastus tells us that he assigned responsibility for each type of flavour or colour to a particular shape of atom (flavours at *DS* 65–7 and *On the Causes of Plants* VI 1.6 = A129/T125, colours at *DS* 73–8). For example, Democritus defines sharp flavour as follows:

> Sharp flavour consists of small, fine-grained atoms of an angular, zigzag shape. Because these are pungent they penetrate everywhere, and because they are rough and angular they compress and contract, thus creating empty spaces in the body and heating it. (*DS* 65)

Similarly, Democritus identified sour flavour with 'large, many-angled atoms with the minimum of roundness' (*DS* 66), sweet flavour with 'round atoms which are not too small' (*DS* 65), and so on.

But no one shape is found unmixed and pure; one shape is always mixed with others.

> None of [the atomic shapes] is found pure and unmixed with others, but in everything there are many, and the same thing contains smooth, rough, round, sharp, and the rest. The shape which occurs most frequently among the constituents is the one which determines how the thing is perceived and what properties it has.... (*DS* 67)[68]

p. 208 Thus, an explanation of what causes different sorts of perceptions also has to refer to (2) the relative predominance of the different types of atomic shapes in a mixture. If good-sized round atoms predominate in an object, then it will give rise to the taste of something sweet; an object containing mostly large many-angled atoms will produce a different, sour, sensation.

Furthermore, any mixture of different shapes of atoms will possess (3) some order and arrangement, with respect to which rearrangement and transposition are possible,[69] and such transposition will produce differences in appearances. As Aristotle puts it, a text of tragedy and a text of comedy are made up out of the same letters, but differ in their arrangements and transpositions of those letters; so too, different rearrangements and transpositions of shapes in a compound will give rise to differences in appearances. For example, a compound in which all the atoms that produce black appearances are thoroughly mixed with the atoms that produce white appearances will look different if the latter become separated off from the rest. Thus, the same thing can look different to different people because its constituent atoms have been rearranged over time, so that each person perceives (correctly) a different arrangement of atoms and void.

So far, Democritus seems to have appealed to three different factors to explain differences in appearance: (1) the size and shape of the atoms, (2) their relative predominance in a mixture, and (3) their arrangements and rearrangements in that mixture. Did he acknowledge the importance of environmental conditions and the physical condition of the perceiver and the sense-organ as factors in what causes things to appear differently to different perceivers?[70] Such differences in appearances include not only the fact that a sunflower looks different from a daffodil but also the fact that a sunflower may look different to different people. According to Theophrastus, Democritus should have taken this into account, but does not.

> (2.1) These [sc. shapes] would perhaps appear, as said above, to be posited for the sake of those [sc. flavours]; he thinks that by this account he can explain their effects, why one contracts, dries and congeals, another smooths, settles and makes regular, another separates and permeates, and so on. Except that perhaps someone might also ask those theorists to say what the subject is like (τὸ ὑποκείμενον ἀποδιδόναι ποῖόν τι). For one has to know not only what is active (τὸ ποιοῦν), but also what is

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

> acted on (τὸ πάσχον), especially if the same flavour does not appear alike to everyone, as he says; for there is nothing to stop what is sweet to us from being bitter to some other animals, and similarly for the rest. (2.2) For it is clear that there is a different constitution of the sense-organ; for the shape underlying the flavour is the same, and it seems that that cannot always have the same effect on a different subject. And if that is true, it is clear that one must take into account the dissimilarity of
> p. 209 subjects. So one should discuss them. At the same time this too is clear, ↳ that the same shape does not have a single effect, if it can act in opposite ways on different subjects. That not everything should be subject to the effect of it is not so absurd, (2.3) for instance fire does not burn everything; but if some things are affected in opposite ways, that needs further discussion. Yet one has to state some cause of those cases; in the case of those things which fire cannot burn or water moisten, there is some cause and explanation; and if they did the opposite, one would need yet more. (*On the Causes of Plants* VI.2.1–3 = partly A130/T125)

As Theophrastus points out, fire has the power to heat, but whether it will successfully heat an object depends on the disposition and condition of that object. A log thoroughly doused in cold water will not light up like dry kindling; similarly, whether something is good at cutting depends on the type of material being cut, say, sheets of paper vs. sheets of metal. Democritus should have discussed the importance of the condition of the perceiver —not because this is Theophrastus′ own view of the matter, but because it is Democritus′ goal to explain the causal effects that atoms have in the world, and thus he is obliged to say something about the contributory role of the physical condition of the subjects in which those effects are produced.

Despite what he says, Theophrastus′ point cannot be that Democritus nowhere discusses the role of the perceiver′s condition in perception anywhere, but rather, that while he does so in certain writings, he does not in his accounts of individual sensible qualities.[71] For Theophrastus himself mentioned (4) the role of the environment and (5) the condition of the perceiver in his report of Democritus′ theories of the senses. As we saw in §8.3.1, Democritus discusses the role of the environment when he introduces air-impressions and talks about the role of the sun in vision. And he emphasizes the importance of the condition of the perceiver as a necessary condition for vision to occur: an eye must be properly moist, and not too dense, and porous inside without any dense, strong flesh or thick, greasy liquid, and the veins around the eye must be straight and free of moisture (*DS* 50). If the pores in the sense-organ are not properly moist, or if they are too hard, this will block the reception of the image, and one will fail to see. Similarly, for hearing to occur, the external coating of the body must be dense, with empty veins, dry, and well-bored throughout (*DS* 56). This shows that Democritus thinks that perception occurs when objects affect the sense organs in certain ways, and that the condition of the sense-organ makes an important contribution to what the effect will be. Moreover, Theophrastus concludes his description of Democritus′ definitions of flavours with the following remark:

> The shape which occurs most frequently among the constituents is the one which determines how
> p. 210 the thing is perceived and what properties it has, though that also ↳ depends on the disposition of whatever observer it comes into contact with; for there are considerable differences there too, since sometimes the same feature produces opposite effects, and sometimes opposite features produce the same effect. That is his account of flavours. (*DS* 67)

This indicates that Democritus did acknowledge the importance of environmental conditions and the condition of the perceiver. If so, then Theophrastus′ point must be that he fails to do so when he identifies individual sensible qualities, like sweetness or the colour white, with specific atomic shapes.

We can now characterize in general terms the way Democritus went about explaining the perception of sensible qualities. He apparently referred to at least five causal factors in the production of different perceptions: (1) the size and shape of atoms, (2) quantity and preponderance in a compound, (3) arrangement, (4) environmental conditions, and (5) the condition of the perceiver. His explanations make excellent sense if he was trying to identify the causal factors at the atomic level which can explain differences in appearances, that

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

is, why things look different from one another, and why two people can differ in their perceptual experiences of the same things. If Democritus is able to explain how perception occurs, and which features of atoms and void in objects are responsible for the affections they cause in sense-organs, there will be two payoffs for him. First, he will be able to give causal explanations for why things appear the way they do to us, and demonstrate what basis our perceptions have in the material world. Discovering the causal bases for perceptual appearances is like figuring out how a thermometer works, what its readings correlate with and why. According to Aristotle, Democritus' achievement is to show that *contra* the Eleatics, 'there is truth in appearances' (*GC* I 2. $315^{b}9$ = DK 67 A9); in so doing, he confirms the ability of the senses to detect and discriminate among the different features of the world around us. Second, being able to explain how the senses work indirectly reinforces the atomist theory itself, as a demonstration of its superior explanatory power. Aristotle suggests that the motivation for postulating an infinite variety of shapes and sizes was to explain the variety of appearances in the visible world as effects which the atoms give rise to; this is consistent with our earlier suggestion that Democritus' method was to start from observed features of the world and to move by means of abductive inference to conclusions about the nature and properties of atoms and void. Just as the hypothesis of the existence of God in the design argument is supposed to explain otherwise inexplicable features of the observable universe and, if successful, is confirmed as the best available explanation of those features, so too the atomist theory is supposed to explain the nature and origin of perceptual appearances, and, if successful, is itself confirmed in so far as it offers the best explanation of appearances available.

However, it is less clear what kind of theory of sensible qualities this commits Democritus to. Theophrastus suggests that Democritus denied that sensible qualities have any nature of their own, that he thought that when perceptual appearances conflict, one is no more true than the other. It is worth setting out this important
p. 211 passage in full. ↳

> τών ζέ άλλων αισθητών ονδενος εἶναι φύσιν, άλλα πάντα πάθη της αισθήσ€ως άλλοιουμένης, є᾽ξ ης γίν€σθαι την φαντασίαν. ονξσέ γάρ τον φνχροῦ και τον θἶρμοϋ φύσιν ὑπάρχεἶν, άλλα το σχήμα μεταπἶπτον Ιργάζεσθαι και την ημἶτίραν άλλοίωσιν ο τι γαρ άν άθρουν ἡ, τβύτ᾽ ένισχύζιν ίκά,στψ–, το δ εἶς μακρά διανζνεμημςνον άναίσθητον ζἶναι. σημεἴον δ ώς ουκ εἶ.σι φύσεἶ το μη ταύτα πάσι φαίνεσθαι τοις ζώοις, «λλ᾽ δ ημἶν γλυκύ, τοῦτ᾽ άλλοις πικρον και ίτέροις οζύ και άλλοις ορημύ τοἶς §6 ατρυφνον και τα άλλα δ ωσαύτως, έτι δ᾽ αυτούς μ€το,βάλλ€ἶν τη κρίσζι[72] κατά τα πάθη και τάς ηλικίας· ἡ και φανερόν, ώς ή διάθίσις αιτία της φαντασίας, απλώς μζν ούν περϊ τών αισθητών ούτω δεἶν ύττολαμβάνειν, ου μην άλλ′ ώσπίρ και τά άλλα και ταύτα άνατίθησι τοις σχημασί′ πλην ονχ απάντων άποδίδωσι τάς μορφας, άλλα μάλλον τών χυλών και τών χρωμάτων και τούτων ακριβίστερον διόριζα τα π€ρι τους χυλούς αναφερών την φαντασίαν προς άνθραηταν.
>
> None of the other sensible qualities [besides heavy, light, hard, soft] has any nature of its own, but all are affections of the sense when it is altered so as to give rise to an appearance.[73] For there is no nature belonging to hot or cold, but change in shape [sc. of the thing perceived] brings about alteration in us; a concentrated effect dominates each individual, whereas an effect which is spread out over time is not noticed. The evidence for this is that things do not naturally seem the same to all creatures, but what is sweet to us is bitter to other creatures, sharp-tasting to others, pungent to others, sour to others again, and the same for other cases. (64) Further, they [i.e. observers] vary in their judgements according to their different states and to their ages; which makes it clear that their disposition is the cause of how things seem to them. That, omitting qualifications, is how one should regard the objects of sense. However, these [sc. the objects of sense][74] are, like everything else, ascribed to the shapes [sc. of the atoms]. Though he does not set out the shapes underlying them all, but rather those underlying flavours and colours, and of these flavour is given the more precise account, in which the appearance is referred to [the state of] the individual. (*DS* 63–4, trans. Taylor modified)

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

Sensible qualities lack their own nature not because they have no external reality,[75] but because they are 'affections of the sense when it is altered so as to give rise to an appearance'. This suggests that if F has its own
p. 212 nature, then the ↳ question of whether or not an object has F depends solely on facts about that object, and a definition of F will refer only to intrinsic properties of an object. By contrast, if F does not have its own nature, then it cannot be defined without reference to something else to which it stands in some relation. In Democritus' theory, a sensible quality cannot be defined without reference to the fact that objects which have it produce a certain alteration or effect. Moreover, it is not enough to produce an alteration or effect; the alteration has to be noticed by the perceiver ('a concentrated effect dominates each individual, whereas an effect which is spread out over time is not noticed'). That is, whether an object is sweet depends not only on whether it produces a certain effect on the tongue; it depends on whether it produces the impression of sweetness in the perceiver. Thus, when Theophrastus says that Democritus deprives sensible qualities of their own nature, we could also put this by saying that Democritus makes sensible qualities subjective, perceiver-dependent properties of objects.[76]

The reason why sensible qualities must be affections of the senses is that things do not seem the same to all creatures; what appears sweet to human beings may seem bitter to other animals. Furthermore, things do not appear the same to all human perceivers, because of their condition and ages; the condition of the perceiver can explain why different perceivers may simultaneously perceive the same object differently, as Theophrastus reports:

> Further, they [sc. observers] vary in their judgements according to their different states and to their ages; which makes it clear that their disposition ((ή διάθεσις) is the cause of how things seem to them (αίτια ττίζ φαντασίας) (*DS* 64)
>
> [How a thing is perceived and what properties it has] also depends on the disposition of whatever observer it comes into contact with. For this makes no small difference. Thus, the same thing sometimes causes opposite effects, and opposite things the same effect. (*DS* 67)
>
> He has previously said that things appear differently to those who have different dispositions (το τοις άνομοίως διακειμίνοις ανόμοια φαίνεσθαι), and again that none has more truth than any other (το μηθερ μάλλορ ςτςρον έτερου τυγχά,νει,ν της αληθείας). (*DS* 69)

Recall that Aristotle also reports that Democritus made use of the conflicting appearance argument
p. 213 (*Metaphysics* Γ5. 1009^{b}7–12 = A112/T177). Evidently, ↳ Democritus takes the fact that the same thing appears different to different perceivers as a sign that what one perceives depends on how one is affected, which in turn depends on one's particular physical condition. But no one's appearance is more true than another's.

It is significant that Theophrastus raises the same objections to this argument in Democritus that Aristotle raises against Protagoras. For example, he argues:

> It is reasonable that the better should have more truth than the worse and the healthy more than the sick, for they are more in accordance with nature. (*DS* 70)

This echoes Aristotle's argument that not everyone is equally authoritative and in an equally good position to judge (*Met*. Γ5. 1010^{b}3–11, cf. § 7.8). He continues:

> Further, if there is no nature of the objects of sense because they do not appear the same to everyone, it is clear that there will be no nature of animals or other bodies; for there is not [universal] agreement in judgement on those either. (*DS* 70)

Theophrastus' point is that Democritus' inference from the fact of conflicting appearances that sweet, bitter, etc. are simply a matter of perceiving something to be such assumes, mistakenly, that universal agreement is a

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

necessary condition for something's being the case by nature. If the fact that sensible qualities do not appear the same to everyone shows that there is no objective nature of sensible qualities, then the same argument could be used to show that there is no nature of anything at all, since it is presumably possible to find disagreement on any matter. Theophrastus' next objection also echoes Aristotle:

> And again, even if sweet and bitter are not tasted by everyone in the same circumstances, all the same the nature of sweet and bitter appears the same to everyone, as he himself would appear to testify. For how could what is sweet to us be bitter or sour to other perceivers if there were no determinate nature of these qualities? (*DS* 70)

Aristotle argued that even if things appear sweet and bitter to different people, there is no disagreement about sweet and bitter themselves (*Met*. Γ5. 1010^{b} 19–30, cf. § 7.8). Here, Theophrastus says that Democritus himself must agree that there is a nature of sweet and bitter, which is universally apparent to all, since otherwise we could not even talk of sweetness and bitterness.[77] This objection, like the previous two, attacks the idea that the fact of conflicting appearances concerning sensible qualities shows that they do not have their own nature, and that they are nothing other than states of the sense.

If Democritus espoused a Protagorean theory of sensible qualities, according to which nothing is really sweet or bitter, but is so only if it appears so to someone, then we can make sense of Theophrastus' argument that Democritus' view of the nature of sensible qualities conflicts with his own definitions of individual sensible qualities in terms of objective properties of atoms and void. ↳ ὅλως δέ μέγιστον έναντι ω μα και κοινον έττι –πάντων, άμα μέν πείθη ποιεῖν της αιαθησεως, άμα δε τοις σχήμασι διορίζειν, και το αυτό φαίν€σθαι τοις μέν πικρόν, τοις δέ γλυκύ, τοις δ᾽ άλλως. οντ€ γαρ οῖόν ⟨τε⟩ το σχήμα πόβος ῖῖναι οῦτ€ ταύτον τοις μέν σφαιροειοές, τοίς δ′ άλλως. ανάγκη δ᾽ [ίίπερ] ίσως, εῖτκρ τοις μέν γλυκύ, τοις δέ πικρόν, ονοέ κατά τάς ημετέρας εζεις μεταβάλλειν τάς μορφάς. άπλώς ζέ το μέν σχήμα κα,θ′ αότό εστί, το δε γλυκύ και όλως τὸ αίσθητον προς άλλο και έν άλλοις, ώς φησιν. άτοπον δέ και το πάσιν άζιοῦν ταύτό φαίνεσθαι τω῀ν αυτω῀ν αἰισθανομενοις καὶ τούτων την άλήθειαν έλέγχειν, και ταύτα ειρηκότα προτερον το τοις άνομοι ως διακειμένοις ανόμοια φαίνεσθαι και πάλιν το μηθέν μάλλον έτερον έτέρου τυγχάνειν της αληθείας.

p. 214

But in general the greatest contradiction, which pervades the whole theory [of sensible qualities], is his both making them states of perception and at the same time distinguishing them by their shapes, and saying that the same thing appears bitter to some, sweet to others, and different to yet others. For it is impossible for the shape to be a state, or for the same thing to be spherical to some and differently shaped to others (yet perhaps that is how it has to be, if it is sweet to some and bitter to others), or for the shapes to change according to our dispositions. It is simply the case that shape is intrinsic, but sweet and sensible qualities in general are relative and dependent on other things, as he says. And it is absurd to require that the same appearance should be presented to everyone who perceives the same thing, and should be the test of their truth, when he has previously said that things appear differently to those who have different dispositions, and again that none has more truth than any other. (*DS* 69–70)

Theophrastus' basic point here (and also at *de caus. plant*. VI.2.1 = A130/T125) is that it is inconsistent (A) to identify individual sensible qualities with intrinsic qualities of the atoms (e.g. by saying that sweet is round good-sized atoms), but at the same time (B) to define sensible qualities generally as affections of the senses (*DS* 61, 63, 72) and (C) to maintain that the same thing may be sweet for one person and bitter for another (where one is no more correct than the other). These can be combined in various ways to produce absurdity. For example, (B) says that a sensible quality is identical with a state of the sense, and (A) says that a sensible quality is identical with a kind of shape of atoms; but, as Theophrastus says, 'it is impossible for the shape to be a state [sc. of the sense].' It is also impossible 'for the same thing to be spherical to some and differently shaped to others (yet perhaps that is how it has to be, if it is sweet to some and bitter to others)', but this follows again from (A) and (C), which says that the same thing may be sweet for some and bitter for others. If (A) sweetness can be identified with atoms of a certain spherical shape, and (C) some things are sweet for some and not for

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

others, then either the atoms of that object must be spherical for some and not for others, or atoms can change with respect to their shapes. All of these consequences would presumably be unwelcome for Democritus.

But we can now see that Democritus probably does not intend (A): or, at least, when he identifies an individual sensible quality with a specific shape of atom, this is not supposed to constitute a definition. When he identifies sweetness with round good-sized atoms, he presumably thinks there are consistent causal correlations
p. 215 between round, good-sized atoms and the sensation of sweetness ↳ they produce on the tongue. He may even think that it is impossible for a round atom, which normally produces a sweet taste, to produce the flavour of bitterness, even in someone ill.[78] If someone perceives the flavour of sweetness, some round atoms must have produced that flavour; that is, the presence and activity of round atoms on the tongue is a necessary condition for the production of the sensation of sweetness. This condition is quite strong, and may have led Theophrastus to suppose that Democritus intended to define individual sensible qualities in terms of atomic shapes.

But if Democritus did not think it possible for round atoms to produce a sensation of bitterness, then how could he have held, as Theophrastus repeatedly says he does, that (C) different perceivers perceive the same object in different ways? The answer must be that shape is necessary but not sufficient for producing a certain effect in a perceiver, because perceptual effects are produced not by single atoms but by composites. Thus, different perceivers can taste different parts of a mixture or can be affected by different sets of effluences coming from a single object, which might be similar, but are distinct in number. Once those atoms reach the perceivers, they will encounter perceivers in different physical conditions, with sense organs that admit atoms of some kinds but not others. For example, internal ear cavities must be sufficiently dry to be affected by air movements; otherwise, moisture will clog up the cavities. A glass of wine in which a small quantity of pointy atoms is floating in a sea of round atoms will taste sweet to the normal person. But to someone who is ill and whose tongue-pores are therefore closed off to all but the small spiky atoms that produce the flavour of bitterness, it will taste bitter.

If we suppose that sentences like ‘Sharp flavour consists of sharp-angled atoms (τὸν μέν οὖν εἶναι τώ σχήματι γφνοειδη) constitute not definitions of sweetness but necessary conditions for the perception of sharp flavour—and thus that Theophrastus is wrong to regard (A) as a definition—then Democritus′ position can be made consistent: he thinks that (B) sensible qualities are affections of the sense organ and that (C) one appearance is no more true than another. According to Democritus, there is no independent fact of the matter about whether something is sweet, bitter, red, or white. This has nothing to do with the atoms′ being microscopic and therefore individually beyond the scope of our sense organs. That issue seems to me a red herring; we cannot perceive the shapes of atoms, but that doesn′t prevent shape from being an intrinsic property of atoms. As Taylor argues, the reason why atoms lack the so-called secondary qualities like smells, colours, and flavours is not because they are too small to be detected, but because Democritus has an observer-dependent conception of secondary qualities, according to which ‘for an object to be red…is…for it to emit films of atoms of such a nature that, when those films collide with an appropriately situated perceiver, the object will look red to that
p. 216 perceiver’ ↳ (1999a: 177). Thus, by definition, single atoms cannot have colours and smells because only aggregates can send off films of atoms.

I think Taylor is on the right track, but that Democritus′ view is even more radical than the one he describes. According to Taylor, Democritus has a dispositionalist account of sensible qualities; there is a fact of the matter about which objects have which qualities, though it is a perceiver-dependent fact, relative to a standardized perceiver. Something is blue if it emits films of atoms of such a nature that it will look blue to a perceiver in the right condition, under the right lighting conditions, etc. Of course, if it is dark or the perceiver is ill, it may fail to appear blue; it is blue nonetheless, for it still has the disposition to produce such appearances under normal conditions. However, this is not Democritus′ view, for he maintains that one appearance is no more true than another. If so, there is no such thing as being blue or being sweet *simpliciter*; if something were blue or sweet *simpliciter*, then those who fail to perceive blueness or sweetness would be wrong. But Democritus denies that

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

any sensory impressions are true rather than others. Thus, he must think that being sweet is a matter of appearing sweet to someone; there is no other fact of the matter involved. That is, Democritus held a radically subjectivist account of sensible qualities: a thing has a sensible quality if and only if it appears to so to a perceiver.

Democritus may have been nudged in the direction of saying that no appearance is any more true than another in part by his own theory of perception (cf. §8.3.1). Democritus′ theory of perception focuses on the effect on perceivers of effluences, or films of atoms coming off the object, which are in turn affected by the intervening medium between object and perceiver. Macroscopic objects produce effluences and (in vision) have a role in compressing air. But it is not clear whether the represented object of perception is the same as the cause of the perception. When one is looking at a mountain creek, one′s contact with the collection of atoms constituting that creek is minimal at best, on Democritus′ view, for strictly speaking one is affected only by a tiny subset of those atoms that happen to reach one′s senses in the perceptual process. But if we therefore say that perception is of something produced in the perceptual episode, and not of the object itself, then we are not strictly speaking perceiving or being affected by the same things in perception, but something unique to each perceptual encounter, and the colour or image produced in one person′s encounter with a stone is not the same as that produced in any other. Thus, what we see—sensible qualities—is to be identified with the effect produced, not something outside the perceiver.

This attitude toward sensible qualities has profound epistemological implications for the senses as a cognitive capacity and source of knowledge. If the senses tell us about sensible qualities, but these are really nothing other than the effect that atomic bombardments have on our senses, then what exactly is the value of what the senses teach us about the world? Democritus was evidently worried about this aspect of perception, as we shall see when we turn next to Sextus Empiricus, who describes just such an attack on the senses and their prospects as potential sources of knowledge.

Notes

1 In this chapter, references to testimony or fragments of Democritus are given to Diels-Kranz's *Die Fragmente der Vorsokratiker* (6th edn., 1952), and to Taylor, *The Atomists: Leucippus and Democritus* (1999*a*). References of the form ‘A114’ or ‘B9’ are abbreviations of ‘DK 68 A114’ and ‘DK 68 B9’; they refer to the testimonia and fragments, respectively, in Diels–Kranz ch. 68 on Democritus. References preceded by the letter ‘T’ are to Taylor's edition; ‘T1’ refers to Taylor testimony no. 1, and ‘TD1’ refers to Taylor fragment ‘D1’. All translations of the Democritean fragments or testimony are Taylor's, unless otherwise indicated.

2 Mejer 1968: 58–9. One exception to the rule that Protagoras and Democritus are studied separately is in the area of ethics and politics, where some scholars have detected similarities between their theories; cf. Nestle 1908, Segal 1961, Cole 1961, Nill 1985, Farrar 1988.

3 Davison 1953: 33–8; see also Morrison 1941: 2–7, Ferguson 1965: 19–20.

4 These dates come from Apollodorus' testimony in DL IX 41 and II 7, according to which Democritus said in the *Mikros Diakosmos* that he was forty years younger than Anaxagoras (=B5/T6), for whom Davison (1953: 39) gives a birthdate of about 500; they are generally accepted (cf. Ferguson 1965). Thrasyllus' testimony (DL IX 41 = A1/T6), which gives Democritus a birthdate of 470/69, is also plausible (cf. O'Brien (1994: 655–77), who argues for a date of death in 380/79), but Diodorus Siculus' testimony (XIV 11, 5 = A5/T10), with dates of 494–404, is not. See also Davison 1953, Mansfeld 1983*b*; Salem (1996*a*: 23–8) gives a useful summary of the evidence and issues.

5 DL IX 50, 53 = DK 80 A1, citing Aristotle's ‘On Education’ and Epicurus as authorities; repeated also by Athenaeus, *Deipnosophistes* VIII 354C = A9, and by Philostratus, *V. soph*. 10 = A9; Hesych.(?) ap. *Sch. Plat. Rep*. 600C = DK 80 A3. (The evidence is collected at T14.)

6 Cf. Davison 1953: 38–9, Ferguson 1965: 20. The τύλη may have been a metaphor for some kind of grammatical or rhetorical invention, or have some connection with the report of Protagoras' dividing speech into four kinds, which follows immediately after in Diogenes Laertius. The testimony which makes Protagoras a protégé of Democritus cites Epicurus as an authority and may derive from Epicurean efforts to downplay his influence on Democritus. Another possibility is that it

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

derives from misunderstandings of comic references to him. Dover (1976) notes that an incident or bit of slander retailed on the comic stage is often reported a hundred years later as truth by historians or anecdotalists; we do, in fact, know of the existence of comedies in which Protagoras was a character (Eupolis, *Kolakes* 146–78 Kock).

7 Aristotle attributes the atomist theory to Leucippus and 'his associate' Democritus (*Metaphysics* $985^{b}4$ = DK 67 A6/T46a; cf. *GC* A8. $324^{b}35$–$326^{b}6$ = DK 67 A7/T48a), as does Simplicius (*Commentary on Physics* 28.4–27 = DK 67 A8/T45). Almost nothing is known about his life, birthplace, and dates, except that he was older than Democritus, and thus lived some time in the fifth century (Taylor 1999*a*: 157–8).

8 Democritus' death date is usually calculated on the basis of the testimony of Pseudo-Lucian, *Macrob*. 18 (=A6/T11a; cf. Censor. 15, 3 = A6/T11b), according to whom Democritus lived 104 years, but Davison (1953: 39) argues that this number probably comes from Epicurean attempts to make Democritus older than Protagoras; since there is evidence in Plato that Protagoras was old enough to be Socrates' father, their solution was to make Democritus thirty years older than Socrates, with a birthdate of 499. If so, then Pseudo-Lucian's testimony implies that Democritus' death date was in fact 396; if we assume he was born around 460, then he lived to the age of 64. It is also possible to use the testimony of Diodorus Siculus, according to which Democritus lived to 90 (cf. O'Brien 1994: 674–7).

9 It has been argued that the author of the text of the Anonymus Iamblichi (DK 89) was Democritus; it contains close parallels with the fragments of Protagoras and Democritus (Cataudella 1932, Cataudella 1937). But A. T. Cole (1961) argues that Anonymus was probably not Democritus but an Athenian follower of Democritus who was influenced by late fifth-century rhetoric; he concludes: 'the treatise is, however, a faithful reproduction of the contents, if not the style, of its model' (Cole 1961: 155), Democritus' *Peri Andragathias e Peri aretes* 'On the Goodness of Man or On Excellence', now lost (DL IX 46).

10 For a survey of Democritus and his influence in antiquity, see Schmid–Stählin 1948: I.5.236–349; on the fate of his writings in antiquity, see pp. 243–53.

11 Plutarch's *Against Colotes* and *Quaest. Conu.* in the 1st c. AD seem to indicate a personal acquaintance with Democritus' writings. R. Löbl (1987: 58) argues that Democritus was read up to the fourth century AD, but Schmid and Stählin (1948: 247) think he was not widely read after the third century BC. O'Brien (1981: 279–81) notes that, unlike with Parmenides, Anaxagoras, Empedocles, and Diogenes of Apollonia, Simplicius does not attempt to say anything about what Democritus really thought, based on his own perusal of the evidence; this strongly suggests that he did not possess the texts of Democritus. At the same time, as O'Brien notes, 'it does not show that [Simplicius] considers himself to be lacking in information about what I may perhaps call the facts of Democritus' theory.' That is, Simplicius seems to have found Aristotle's treatise on Democritus and some version of Theophrastus' *Physicorum Opiniones* sufficient for determining the basic character of early atomist theory.

12 Cicero, *Acad.* II, 23, 73 = partly in B165/TD5 cit.

13 Philodemus, *On Music* Herculaneum papyrus 1497, col. XXXVI.29–39 = B144/T213; see also Seneca, *Natural Questions* VII.3.2 = A92, DL IX 40 = A1/T6.

14 Dionysius of Halicarnassus *De Comp. Verb.* 24 = A34/T41d, Cicero *Orator* 20.67 = A34/T41b, *De Oratore* I.11.49 = A34/T41a, *De Divinatione* II.64.133 = A34/T41c, Plutarch *Quaest. Conu.* 5.7.6, 683A (=A77/T133b).

15 Possible allusions to Democritus at *Timaeus* 48bc and at *Sophist* 246ab (cf. Cornford 1935: 231). Thrasyllus thought that the unnamed 'pentathlete' in the *Rivals in Love*, if by Plato, might be Democritus (DL IX 37), but the dialogue is generally held to be spurious.

16 Cf. Natorp 1890a, Hammer-Jensen 1910, Bollack 1967, Ferwerda 1972. Bollack argues that Plato was not hostile to Democritus; Ferwerda suggests the problem may not have been professional jealousy (*pace* DL X 40 = A1/T6), but political differences with Democritus' pro-democratic inclinations (on which see Farrar 1988).

17 Aristotle does not mention Democritus' ethics; as C. H. Kahn (1985: 2) suggests, he may have thought they were outmoded in comparison with Plato's (cf. *Parts of Animals* I 1. $642^{a}24$–31 = A36/T43a, quoted in §9.2.3).

18 All of the evidence is collected in DK ii. 92–3. Aristotle devoted two works to him, Περὶ Δημοκρίτου 'On Democritus' (Simpl. *de caelo* 294.33 = A37/T44a) and Προβλήματα ἐκ τῶν Δημοκρίτου β' 'Problems from Democritus' (DL V 26). Theophrastus: Περὶ Δημοκρίτου ᾱ (DL V 49), Περὶ τῆς Δημοκρίτου ἀστρολογίας ᾱ (DL V 43). Heracleides Ponticus, a student of Speusippus' who attended Aristotle's lectures: Περὶ ψυχῆς καὶ περὶ φύσεως καὶ περὶ εἰδώλων πρὸς Δημόκριτον (DL V 87), Πρὸς τὸν Δημόκριτον ἐξηγήσεις (DL V 88). Epicurus: Πρὸς Δημόκριτον (schol. Zenon. de lib. dic. VH^{1} v 2 fr. 20 = Usener *Epic*. p. 97,10). Metrodorus of Lampsacus: Πρὸς Δημόκριτον (DL X 24). Cleanthes: Πρὸς Δημόκριτον (DL VII 174). Sphairos of Bosphorus wrote Περὶ ἐλαχίστων, Πρὸς τὰς ἀτόμους καὶ τὰ εἴδωλα (DL VII 178), but it is not entirely clear to me that these books are about Democritus.

19 For references and discussion, see Huby 1978; she defends Epicurus from the charge that he had a pathological unwillingness to admit that he was indebted to any teacher or predecessor, not even Democritus. Sedley (1992*b*: 22) suggests that the very idea of atomism as constituting a single school in antiquity is a modern doxographical fiction.

20 On the successions literature from the second century AD on, see von Kienle 1961.

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

21 Cf. Brunschwig 1999, Bett 2000a: 152–60.

22 Cf. Clement *Strom*. I 64 (=DK 70 A1), SE *M* VII 87–8 (=DK 70 A25), Cicero *Ac. pr*. II 23.73 and Eusebius *PE* XIV 19.8=DK 70 B1.

23 DL IX 61; cf. Bett 2000*a*: 1–2.

24 Aristocles in Eusebius, *PE* XIV.18.27; see also Numenius in Eusebius, *PE* XIV.6.4.

25 Decleva Caizzi (1984) suggests that Pyrrho may have been interested in Democritus' atomism not as a scientific theory of cosmology, but more as a myth or metaphor for the vanity of human life, and thus chiefly interested in atomism's ethical implications. By contrast, Bett (2000*a*: 152–60, 187–8) argues that Pyrrho was interested not in Democritus' atomism or any kind of physical theorizing, but in his epistemology.

26 DL I 15 (=T198a), Clement *Miscellanies* I.64 (=T198a), DL IX 64, 69; SE *M* 1.2; Eusebius *PE* XIV.20.14.

27 See DL IX 38 (=A1/T6), DL IX 46 (=T40), Proclus *Commentary on Plato's Republic* II 113.6 Kroll (=B1/T112d). Democritus' connection with the Pythagoreans is discussed by Cataudella (1932, 1937) in the context of the Anonymus Iamblichi (reference from Cole 1961: 155). Some dismiss these purported connections, but not Burkert (1972).

28 Cf. Tarrant 1993: 85–9. According to Thrasyllus, 'He [sc. Democritus] seems to have been an adherent of the Pythagorean doctrines; and indeed he refers to Pythagoras himself, expressing admiration of him in his book of the same title. He appears to take all his views from him, and would even appear to have been his pupil, did not chronology make that impossible' (DL IX 38 = A1/T6). Thrasyllus accordingly gave pride of place to Democritus' 'Pythagorean' books in the first tetralogy in his catalogue (DL IX 46 = A33/T40).

29 On the influence of Democritus on Hippocratic medicine, see Wellmann 1929, Diller 1934, Lopez Ferez 1974; on his influence on the development of Hippocratic and Hellenistic medicine, see the recent series of studies by Stückelberger 1979, 1984, 1992 (references from Salem 1996: ch. 5). Such influence is hard to prove; Jouanna (1992: 386–7) expresses doubts. An overview of the evidence and literature can be found in Salem 1996*a*: ch. 5.

30 Cf. Stewart 1958.

31 Interpretations of Democritus' epistemology fall roughly into four categories: (1) Some reject Aristotle's testimony as gross misinterpretations of Democritus, mistakenly ascribing to Democritus the view that all perceptions and perceptual appearances are true, and accept Sextus as correctly describing Democritus as a scientist and a rationalist, not a sceptic (Zeller 1920: I.ii. 1135–9, Natorp 1884: ch. 4, esp. 173–8, Rodier 1900: 51, Ross 1924: i. 275, Guthrie 1965, KRS 1983, Curd 2001). (2) Aristotle's testimony cannot be entirely rejected because Sextus also says various things in line with it; hence they must be reconciled (Hirzel 1877: i. 110–17, Weiss 1938, Asmis 1984, Morel 1998, Taylor 1999*a*, 1999*b*). Taylor (1999*a*: 216–22) has a particularly clear and cogent account of how the 'sceptical' fragments fit together with Democritus' theoretical aspirations. (3) Democritus was ultimately a sceptic of some kind (Dyroff 1899, Barnes 1982, Decleva Caizzi 1984, Asmis 1984). (4) Democritus' epistemology contained internal tensions, which he never entirely faced or resolved (Morel 1998, O'Keefe 1997), or, alternatively, he did not really have an epistemology properly speaking (Sedley 1992b: 24 n. 7).

32 See especially R. Hirzel (1877–83: i. 110–17), who argues that Aristotle recognizes Democritus' fundamental epistemological principle, namely, that in order to arrive at knowledge of what is hidden one must proceed from what is given through the senses, and that sensory perception and experience is the point of departure on the way to truth, but that Aristotle puts this somewhat misleadingly as the principle that 'truth lies in what appears'.

33 McKim (1984) is one of the few recent scholars to take seriously the possibility that Democritus conceived of the truth of perceptual appearances as an axiom or explanandum for an adequate account of reality. But more recently Taylor (1999*b*) has endorsed McKim's hypothesis that Democritus shares with Protagoras the position that all perceptual appearances are equipollent, and equally true. One has to look to the nineteenth century to find earlier versions of this proto-Epicurean interpretation of Democritus (Hirzel 1877–83: i. 110–17, Brieger 1902: 56 ff., Dyroff 1899: 74, 88). My interpretation has much in common with that of Hirzel, who emphasizes the importance for Democritus of the epistemological principle—attested to both by Sextus and Aristotle—that the search for truth must begin with the senses, even if they cannot tell the whole truth by themselves.

34 See also Philoponus (*Commentary on Aristotle GC* $315^{b}9$, 23.1–8 = not in DK/T42b), who suggests that Democritus used the theory of shapes in order to explain differences in perceptual appearances between observers, and to 'preserve the truth of those appearances of the same thing'.

35 Aristotle's comments here are important for reconstructing the connections between the early atomists and Parmenides. There is a huge literature on this subject; for a clear statement of the orthodox view, see Taylor 1999*a*: 160–4, and for fuller discussion with references, see Curd 1998: 180–216.

36 Democritus' search for causes is the main theme of Morel 1996, an impressively careful and detailed study of Democritus' *aitiologiai* across a range of topics. Morel makes a persuasive case for thinking that, if we take into account the full scope of Democritus' scientific ambitions, instead of focusing exclusively on a few fragments from Sextus *M* VII, we would be less inclined to suppose that the only causes in Democritus' universe were atoms and void, or that he was necessarily

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

committed to a programme of reductive eliminativism, the position that nothing else exists or can have causal force besides atoms and void.

37 This word is rare, and mostly attested in connection with Democritus or Epicurus; cf. Morel 1996: 25–30.

38 Of course, these titles may not be Democritus' own; even so, ancient titles tend to be labels describing the subject matter of the books. See Schmalzriedt 1970 on how ancient books got their titles.

39 Democritus used the οὐ μᾶλλον formula in a variety of contexts; cf. Graeser 1970.

40 Langerbeck 1935: 114, Kahn 1985: 19.

41 See Kahn 1985: 9–10, 19–24 on why Democritus uses *gnome* where we might expect *psyche*, and his lack of a consistent terminology for psychic functions quite generally. Kahn suggests that Democritus had not fully conceptualized his notions of the soul's psychic and rational functions into a theory of the psyche, such as we find Plato attempting to work out in the *Gorgias* and in the *Republic.* See also Claus 1981: ch. 2.

42 Mansfeld (1996: 168) argues that when Aristotle says 'Homer is thus right to say "Hector lay thinking something else" ', 'il faut ajouter, mentalement, un "comme on prétend" ', and thinks that here as in *Met*. Γ5, the reference to Homer is due to an anonymous third party, in particular, that it may be Hippias who 'serait la source de la majorité des passages parallèles cités par Aristote' (1996: 164 n. 20; see also 1986: 18/40 in reprint). This is part of Mansfeld's argument (1986: 18 ff., 1983*a*: 43 ff.) that Aristotle's doxographies—e.g. *Metaphysics* Book A, *Physics* I, and *De Anima* I 2—may not have been compiled by Aristotle himself, but came from doxographies compiled by others, in particular Hippias, who is known to have made collections of sayings. Hippias could be Democritus' source for this quotation, but φάσι probably refers to Democritus, as Aristotle makes clear in *DA* I 2.

43 Bailey (1928: 173) says that Democritus praises Homer for the term ἀλλοφρονέων ('out of his mind'), 'a word which Democritus thought an exact expression of the effect of anger, which makes the soul too hot and incapable of true thought'. There is no particular reason to think that Democritus or Homer used this term to refer to the effect of anger, but, as we will see from Aristotle's testimony, temperature does indeed affect mental functions because soul-atoms and fire-atoms are, according to Democritus, the same in nature.

44 404^{a}25–31: ὁμοίως δὲ καὶ Ἀναξαγόρας ψυχὴν εἶναι λέγει τὴν κινοῦσαν, καὶ εἴ τις ἄλλος εἴρηκεν ὡς τὸ πᾶν ἐκίνησε νοῦς· οὐ μὴν παντελῶς γ' ὥσπερ Δημόκριτος. ἐκεῖνος μὲν γὰρ ἁπλῶς ταὐτὸν ψυχὴν καὶ νοῦν τὸ γὰρ ἀληθὲς εἶναι τὸ φαινόμενον, διὸ καλῶς ποιῆσαι τὸν "Ομηρον ὡς "'Ἕκτωρ κεῖτ' ἀλλοφρονέων". οὐ δὴ χρῆται τῷ νῷ ὡς δυνάμει τινὶ περὶ τὴν ἀλήθειαν, ἀλλὰ ταὐτο λέγει ψυχὴν καὶ νοῦν.

45 Cf. Langerbeck 1935: 80, Guthrie 1965: 457. As C. H. Kahn (1985: 10) notes, it would have been more accurate for Aristotle to say that Democritus did not clearly distinguish between *psyche* and *nous*.

46 Some sources say that Democritus did locate the mind in a particular area of the body: in the chest (Ps.-Plutarch *Epitome* in Aëtius IV.4.6 = A105/T110a) or in the head (Ps.-Plutarch *Epitome* in Aëtius IV.5.1 = A105/T110b; Theodoretus, *Cure for the Ills of the Greeks* V.22 = not in DK/T110c). Guthrie (1965: 433) accepts Lucretius' testimony that soul-atoms are dispersed with body-atoms throughout the body, but thinks that the *Placita* shows that the mind, or thinking portion of the soul, is 'a concentration of soul in a particular part of the body'; he favours Aëtius IV.5.1 (which puts the mind in the head) over Aëtius IV.4.6 (which puts it in the chest), on the grounds that any source that links Democritus with Epicurus (as Aëtius IV.4.6 does) is likely to be incorrect. Mansfeld (1990*a*: 3088 n. 120) however concludes that Aëtius' testimony does not allow us to determine 'whether Democritus spoke of a dominant part of the soul, let alone where he put it'. Taylor (1999*a*: 200–8) argues, convincingly in my view, that Lucretius is the authority here, and that Aëtius should be rejected altogether; Lucretius is clear that Democritus did not locate it anywhere.

47 H. B. Gottschalk (1986) argues that the particular explanation given here for apparent cases of corpses coming back to life may not be Democritus', but Proclus' explanation based on Plato's myth of Er. Even so, it is clear that Democritus gave some explanation for the phenomenon; cf. Celsus II.6 (A160/T112cit.), Pliny *Natural History* VII.55.189–90 (not in DK/T112cit.), Varro *Satires* fr. 81 (A161/T112cit.), Ps.-Plutarch, *Epitome* in Aëtius IV.4.7 (A117/T112b), Tertullian, *De Anima* 51.2 (A160/T112c).

48 Indeed, some late sources report that Democritus thought that animals and plants can think, which may explain, or be evidence of, ancient Pythagorean interest in Democritus. On plants, see Ps.-Aristotle *On Plants* 815b14–16 (= DK 31 A70, DK 59 A117/T155a) and Plutarch *Natural Causes* I, 911e (=DK 59 A116/T155b). On animals, see Plutarch, *On the Rationality of Animals* 20, 974a (=B154/T187a) and Porphyry, *On Abstention from Animal Food* III.6 (=not in DK/T187b).

49 Taylor (1999*a*: 204–5) suggests quite plausibly that the difference between sensation and thinking, for Democritus, is that sensation occurs when *eidola* fit the channels of a sense-modality and go through them to the web of mind-atoms permeating the body, whereas thinking occurs when more finely structured *eidola* penetrate the body and affect the mind-web directly, without going through sensory channels. Such an explanation for the causal origins of thoughts would have been useful for explaining the origins of dreams, for example, beliefs about the gods, and successful prophecy. Cf. Taylor 1999*a*: 207–8, 211–16.

50 Diels, *Doxographi Graeci* (1879). On the question of what this work was like and what its influence on subsequent

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

doxography was, see Mansfeld 1990*a*, Mansfeld 1992, Mansfeld and Runia 1997. W. Leszl (2002) discusses this in connection with the question of Theophrastus as a source for Democritus.

51 Han Baltussen argues that the *DS* is 'not just a list or collection of *doxai* (Usener, Diels), nor exclusively a critical history (Regenbogen), nor a mere dialectical exercise (Mansfeld)', that 'in essence, it lacks a clear purpose altogether, or at least *one single purpose*' (1998: 196), and thinks that the *De Sensibus* is too large to have been one book of the *Physics*. On the purpose and method of the *De Sensibus*, see also Baltussen 2000 and Mansfeld 1996.

52 Mansfeld (1986: 24) notes: 'There is no doxography in the proper sense of the word in Aristotle or Plato, or even in Theophrastus, because the *doxai* at issue are presented from a systematical point of view in order to further the discussion of problems of a systematical nature.'

53 See the line-by-line comparisons between the *DS* and the *Timaeus* in Long 1996, McDiarmid 1959, and Baltussen 2000: 95–139. Long and McDiarmid deliver negative assessments of Theophrastus' reliability and accuracy; Long describes Theophrastus' account as regularly careless and misleading, with inexplicable omissions and inaccuracies. McDiarmid (1953, 1959) attributes these defects to Theophrastus' Aristotelian bias; Sedley (1992*a*) arrives at similar conclusions in his study of Theophrastus' presentation of Empedocles' theory of vision. Generally positive assessments can be found in Stratton 1917, Kahn 1960: 21, Furley 1993: 74–5, Laks 1999: 256–9, Baltussen 2000: 95–139; these scholars have in mind Theophrastus' superiority both as a source and as an intelligent interpreter to the later sources for the Presocratics. Baltussen (2000: 137–8) defends Theophrastus, arguing, with respect to Theophrastus' report on Plato, that 'accuracy in *reporting* and accuracy in *interpreting* Plato…are separate issues', and that in Theophrastus 'the level of accuracy becomes adjusted to the requirements of the context.'

54 This is also noted by Baltussen (1998: 173–4).

55 *DS* 50: ὁρᾶν μὲν οὖν ποιεῖ τῇ ἐμφάσει ταύτην δὲ ἰδίως λέγει τὴν γὰρ ἔμφασιν οὐκ εὐθὺς ἐν τῇ κόρῃ γίνεσθαι, ἀλλὰ τὸν ἀέρα τὸν μεταξὺ τῆς ὄψεως καὶ τοῦ ὁρωμένου τυποῦσθαι συστελλόμενον ὑπὸ τοῦ ὁρωμένου καὶ τοῦ ὁρῶντος ἅπαντος γὰρ ἀεὶ γίνεσθαί τινα ἀπορροήν ἔπειτα τοῦτον στερεὸν ὄντα καὶ ἀλλόχρων ἐμφαίνεσθαι τοῖς ὄμμασιν ὑγροῖς. καὶ τὸ μὲν πυκνὸν οὐ δέχεσθαι, τὸ δὲ ὑγρὸν διιέναι. διὸ καὶ τοὺς ὑγροὺς τῶν σκληρῶν ὀφθαλμῶν ἀμείνους εἶναι πρὸς τὸ ὁρᾶν, εἰ ὁ μὲν ἔξω χιτὼν ὡς λεπτότατος [καὶ πυκνότατος] εἴη, τὰ δ' ἐντὸς ὡς μάλιστα σομφὰ καὶ κενὰ πυκνῆς καὶ στιφρᾶς σαρκός, ἔτι δὲ ἰκμάδος παχείας τε καὶ λιπαρᾶς, καὶ αἱ φλέβες ⟨αἱ⟩ κατὰ τοὺς ὀφθαλμοὺς εὐθεῖαι καὶ ἄνικμοι, ὡς "ὁμοιοσχημονεῖν" τοῖς ἀποτυπουμένοις. τὰ γὰρ ὁμόφυλα μάλιστα ἕκαστον γνωρίζειν.

56 According to Theophrastus, 'About Anaxagoras' doctrine of the *emphasis*, it is one widely held; for nearly everyone assumes that seeing comes about by means of the appearance (*emphasis*) produced in the eyes' (*DS* 36, see also *DS* 27).

57 See also Burkert 1977: 98.

58 This is probably not original to Democritus; Burkert (1977: 99) notes that ἅπαντος γὰρ ἀεὶ γίνεσθαί τινα ἀπορροήν (*DS* 50) is an almost verbatim quotation from Empedocles fragment B89 γνοὺς ὅτι πάντων εἰσὶν ἀπορροαί, ὅσσ' ἐγένοντο.

59 Aristotle makes this complaint at *De Sensu* 2. 438^{a}5–12 = A121/T117; similarly, Theophrastus asks, concerning Anaxagoras' account of *emphasis*, why vision occurs when something 'appears in' the eye, while it does not occur when something 'appears in' lifeless things, such as water or bronze (*DS* 36).

60 Because other sources for Democritus' theory of vision (T115–22) make no mention of air-impressions, C. Bailey (1928: 167) dismisses Theophrastus' testimony as 'unsupported'. But Theophrastus' testimony is detailed and should be given greater weight than Aristotle's cursory descriptions (*De Sensu* 438^{a}5–12 = A121/T117), which make no mention of air-impressions, no doubt because he has rendered in extremely abbreviated fashion the same theory Theophrastus describes above. For example, Aristotle simply says that Democritus made water that by which we see, whereas Theophrastus gives more detailed explanations of why the eye must be sufficiently moist, not dense or dry, to admit images (*DS* 50, 51, 54); Aristotle's 'seeing is *emphasis* (mirroring)' is obviously a more compressed version of Theophrastus' 'he makes seeing occur by means of *emphasis* (reflected image or mirroring)'. Aristotle's only remark about *emphasis* is that Democritus' explanation of it is unsatisfactory; he does not mention the role of air-impressions probably because it does not interest him. Later authors like Alexander may be following Aristotle's description without consulting the original text—unlike Theophrastus. It is also possible that later sources make no mention of air-impressions because they have assimilated Democritus with Epicurus (cf. Burkert 1977). Epicurus mentions the idea of air-impressions only in order to reject it (*Letter to Herodotus* in *DL* X 49, 53).

61 How the eye contributes to the compacting of air is not clear. Either vision occurs when *eidola* from the object meet a visual ray coming from the eye, like light coming from a lantern (as in Plato *Ti.* 45b, 67c–d, Empedocles DK 31 B84; cf. Guthrie 1965: 443, von Fritz 1971: 612–13, Burkert 1977: 99–100) or he thought air is compacted simply by the pressure exerted from the surface of the eye and the surface of the object (cf. Baldes 1975, Barnes 1982: ch. 22 n. 9, O'Brien 1984: n. 60). The sun or light emits fire-atoms that also play a role in compacting the air, as Theophrastus suggests in his criticism of Democritus (*DS* 54). Hence, light seems to have the double role of compressing the air to prepare it for imprinting and of transporting the image back to the eye.

62 For a fuller discussion of the interpretative options, see Burkert 1977: 102. O'Brien (1984) has more recently argued that

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

Democritus introduced air-impressions in order to explain the perception of the distance of the perceived object. He cites Lucretius IV. 244–53 and Alexander on *De Sensu*, 57.28–58.1 in support of the idea that the atomists thought that the quantity of air blowing through the eye allows us to perceive distance. However, Taylor (1999*a*: 209 n. 41) points out that Theophrastus, at least, does not connect air-impressions with the issue of distance-perception (see *DS* 50 on the former, *DS* 54 on the latter), and since he explicitly wonders about the purpose of air-impressions, he presumably would have made this connection if Democritus had.

63 Zeller 1920: i. 2. 1126–8, Beare 1906: 27, Morel 1996: 194–5.

64 The same questions arise concerning Epicurus' effluence-based theory of perception; cf. Striker 1977, Taylor 1980, Everson 1990.

65 It is worth noting that Theophrastus includes under the rubric of sensible qualities not only Aristotle's list of proper sensibles (colours, sounds, smells, flavours, and tactile qualities) but qualities such as light, heavy, hard, and soft (*DS* 61–2) which are not obviously secondary qualities in the modern sense. This raises difficult questions about the canonical list of sensible qualities, including the vexed question of whether Democritus thought atoms have weight, but these issues lie outside our concerns; for discussion and references, see Taylor 1999*a*: 179–84.

66 The fact that Theophrastus may have extracted a Democritean theory about sensible qualities from what was a discussion of the senses will become important to us in §9.2.1.

67 It is not clear whether Democritus meant to say that there are infinite gradations in size as well; for discussion and references, see Taylor 1999*a*: 173–5.

68 *DS* 67 ἁπάντων δὲ τῶν σχημάτων οὐδὲν ἀκέραιον εἶναι καὶ ἀμιγὲς τοῖς ἄλλοις, ἀλλ' ἐν ἑκάστῳ πολλὰ, εἶναι καὶ τὸν αὐτὸν ἔχειν λείου καὶ τραχέος καὶ περιφεροῦς καὶ ὀξέος καὶ τῶν λοιπῶν. οὗ δ' ἂν ἐνῇ πλεῖστον, τοῦτο μάλιστα ἐνισχύειν πρός τε τὴν αἴσθησιν καὶ τὴν δύναμιν..

69 Aristotle *GC* I 2. 315^{b}6–15 = DK 67 A9/T42a, Theophrastus, *de causis plant*. VI.7.2 = A132/T126, Aristotle, *Met*. 985^{b}13–22 = DK 67 A6/T46a; Simplicius, *Commentary on Physics* 28. 15–27 = A38/T45.

70 This was an important part of the Epicurean explanation of conflicting appearances (Plutarch, *adv. Col*. 1109C–E = LS 16I).

71 Theophrastus has probably taken the descriptions of Democritus' accounts of the individual flavours and colours from Democritus' books on flavours and colours listed in Thrasyllus' catalogue (DL IX 46 = A33/T40); Democritus' account of perception, where he does discuss the importance of the perceiver's condition in perception, probably belonged to a different book, perhaps *On the Senses*.

72 This is the manuscript reading. Schneider, followed by Diels, preferred κράσει; Mullach, with Papencordt, preferred τὴν κρίσιν.

73 Here, Theophrastus seems to be closely paraphrasing Democritus; he returns to speaking in his own voice with the sentence 'That, omitting qualifications, is how one should regard the objects of sense.'

74 Taylor translates this sentence (p. 517.18–19 Diels) as follows: 'Of course, these too [i.e. states of observers] are, like everything else, ascribed to the shapes [sc. of the atoms].' But ταταν】τατα refers to ττών αισθητών in the previous sentence, and *o* ου μην αλλ' ώσπςρ sets up an opposition with what came before. The previous sentence notes the importance of the disposition of the perceiver to how things appear to them; this sentence says that Democritus in fact explains everything, including *ta aistheta* in terms of the shapes, not in terms of the states of perceivers, say, as his *hypothesis* would lead us to expect.

75 According to G. M. Stratton (1917), the sensible qualities lack any external reality, but Theophrastus never suggests that things without a nature do not exist at all. T. S. Ganson (1999: 207–8) also points out that, according to Theophrastus, Plato's account of astringency as what contracts the pores fails to get at the φύαις of the flavour; as Ganson explains, 'accounts of this sort fail to reveal what the essence (την ονσίαν) of each flavor is and why the flavors have the effects they do (διά τί ταύτα δρώσιν). In general an account of the φύσις of a sensible quality will tell us what that quality is such that it has the effects that it does. So φύσις in [sc. *DS*] 60 should be understood as *nature* or *explanatory essence*, not as *external reality*.' This is closer to what Theophrastus has in mind, although it suggests—mistakenly in my view—that to say that a theory 'deprives sensible qualities of their nature' is simply a way of saying that it is a bad explanation of sensible qualities and fails to reveal their essence. On my reading of Theophrastus, a theory of *x* deprives *x* of its nature when it makes *x* a subjective or relational property.

76 O'Keefe 1997 and Ganson 1999 come to a similar conclusion. O'Keefe (1997: 124–6) argues against earlier interpreters according to whom Democritus denies that sensible qualities are real because sensible qualities are changeable (Furley 1993: 93), because all macrosopic objects are unreal (Wardy 1988, Purinton 1991), or because sensations and affections are reducible to physical states (Sedley 1998: 298–9); rather, Democritus denies that sensible qualities are real because relativity implies unreality. Ganson (1999: 212) objects to this last argument on the grounds that properties like *being heavier than iron* are relational according to Democritus but no less real. The larger question of what it is for something to be real, according to Democritus, and whether he would admit *any* relational properties as being 'real' is not one I will try

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025

to address here; for one thing, one must decide whether spatial relations, arrangements, and configurations are 'real' properties of atoms or not.

77 How Democritus might have replied we don't know; it is not clear that he thought in terms of definitions, essences, or universals. But see now Mourelatos 2003.

78 Furley (1993: 80) says: 'There is no hint in *De Sens*. that the same *shapes* produce different *pathe* in different people.'

Downloaded from https://academic.oup.com/book/8133/chapter/153618924 by OUP-Reference Gratis Access user on 15 August 2025