

Empedocles on Sensation, Perception, and Thought

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Abstract

Aristotle claims that Empedocles took perception and knowledge to be the same; Theophrastus follows Aristotle. The paper begins by examining why Aristotle and Theophrastus identify thought/knowing with perception in Empedocles. I maintain that the extant fragments do not support the assertion that Empedocles identifies or conflates sensation with thought or cognition. Indeed, the evidence of the texts shows that Empedocles is careful to distinguish them, and argues that to have genuine understanding one must not be misled into supposing that sense perception is sufficient for knowledge. Nevertheless, sense perception is necessary for human knowing.

In *De Anima* III.3 (427a15 ff.) and in *Metaphysics* Γ.5 (1009b13 ff.) Aristotle claims that Empedocles took perception and knowledge to be the same; Theophrastus follows Aristotle. Why would Aristotle and Theophrastus identify thought/knowing with perception in Empedocles? Are they right about this? I shall argue that the extant fragments do not support the assertion that Empedocles identifies or conflates sensation with thought or cognition. Indeed, Empedocles is careful to distinguish them, and argues that to have genuine understanding one must not be misled into supposing that sense perception is sufficient for knowledge. Nevertheless, sense perception is necessary for human knowing.

I begin by making some distinctions that are implicit in the surviving fragments. Being aware of them can help us to explicate and to understand Empedocles' accounts of sensation, perception, and thought, although I do not suppose that Empedocles himself recognized them.¹ First, I limit the concepts of *sensing* and *sensation* to the mechanical process that occurs in an organism when a sense organ is affected by the external world. For Empedocles seeing in this sense occurs when the relevant effluences (whichever they are) enter the pores of the eye, the organ of sight; hearing as sensing is the affecting "of the cartilaginous part [...] suspended in the ear" by the air "set in motion by the voice" (A93 and A86) and so on, *mutatis mutandis*, for the other senses. I use the terms *perceiving* and *perception* to refer to the *awareness* of an organism that a sensing is occurring. Thus, if effluences of fire and water enter the appropriate pores in my left eye, which admits the effluences but is nevertheless blind, I can be said to sense but not to perceive. If my right ear is deaf (i. e. the nerves fail to connect properly with my brain), the ear drum can be affected by sound waves (effluences) so that my ear is *sensing* but I do not *perceive* sound. Usually, in most animals in good condition, there will be both sensing and perceiving; yet, there may still be differences in range and acuity. The same motions of air can affect

¹ Part of the difficulty is the wide-ranging meaning of *αἰσθάνεσθαι*. See Anaxagoras A117 [Aristotle]: *desiderio eas [plantas] moveri dicunt, sentire quoque et tristari delectarique asserunt*. "Sentire" has the same wide range of meanings. See, for example, the first note in Stratton's 1917 English translation of *De Sensibus*: "The meaning of the word *αἰσθησις* would be more accurately represented here by 'sensation and sense perception'; but this is too cumbersome for frequent repetition. Nor have I found it possible to render *αἰσθησις* by any constant English expression. According to need, it has been translated as 'sense' or 'sensation' or 'sense perception'".

both me and my dog (we both sense, i. e. the relevant parts in our ears are affected by the motion), but his perception is more acute: I perceive nothing, but he leaps to his feet, barking at the sound.² Finally, I use *thinking* to refer to cognitions of various kinds that all involve intellectual states (judging, believing, knowing, understanding, etc.). With these distinctions in hand, we might begin to untangle Empedocles' claims about sensation, perception and thought, and to answer the question why Aristotle, Theophrastus, and those following them say that Empedocles equates sensation, perception, and thinking. (The distinctions can also be useful for grasping what Empedocles means by saying that all things can be affected by pleasure and pain.)

What we might think of as a new consensus about Empedocles has been emerging since the publication of the Strasbourg Papyrus (Martin & Primavesi 1999). While scholars continue to disagree about the number of poems Empedocles wrote (and there are still sharp disagreements about the relations among the doctrines, and about the relations between the cosmic and daimonic cycles), they now more readily recognize that we cannot classify Empedocles' various doctrines as belonging exclusively *either* to physics *or* to religion. Many have discarded the sharp division that dominated some Empedocles interpretation in the 20th century that allowed only certain doctrines, such as the theory of elements and the cosmological cycles to be scientific, while confining others to the religious side of Empedocles' thought. Empedocles was equally serious about and committed to the doctrines on each side (as it were). This means that Empedocles' views about understanding and sensation should fit (in some sense) with both aspects of his thought. A striking example of the overlap of doctrines is apparent in B23:

ὡς δ' ὁπότεν γραφέες ἀναθήματα ποικίλλωσιν
 ἀνέρες ἀμφὶ τέχνης ὑπὸ μήτιος εὖ δεδαῶτε,
 οἷ τ' ἐπεὶ οὖν μάρψωσι πολύχροα φάρμακα χερσίν,
 ἄρμονίῃ μείξαντε τὰ μὲν πλέω, ἄλλα δ' ἐλάσσω,
 ἐκ τῶν εἶδεα πᾶσιν ἀλίγκια πορσύνουσι,
 δένδρεά τε κτίζοντε καὶ ἀνέρας ἠδὲ γυναῖκας
 θήρας τ' οἰωνούς τε καὶ ὕδατοθρέμμονας ἰχθύς
 καὶ τε θεοὺς δολιχαίωνας τιμῆσι φερίστους·
 οὕτω μὴ σ' ἀπάτη φρένα καινύτω ἄλλοθεν εἶναι
 θνητῶν, ὅσσα γε δῆλα γεγάκασιν ἄσπετα, πηγῆν,
 ἀλλὰ τορῶς ταῦτ' ἴσθι, θεοῦ πάρα μῦθον ἀκούσας.

Just as when painters adorn votive offerings –
 men well taught by cunning in their craft –
 who when they take the many colored paints in their hands,
 mixing in harmony more of these but less of those,
 out of them make shapes resembling all things,
 bringing into being trees and men and women
 and beasts and birds and water-nourished fish
 and long-lived gods best in honors.

*So in this way do not let deception overcome your mind
 [to think] there is any other source for mortal things, as many as are*

² Compare to Theophrastus' report about Parmenides on perception by corpses (in *De Sens.* 1.4; 28A46): "A corpse does not perceive (οὐκ αἰσθάνεσθαι) light, heat, and sound because it lacks fire but perceives (αἰσθάνεσθαι) cold, silence, and the other opposites."

*seen, countless, perishable,
but know these things clearly, having heard the story from a god.*
(B23 = G47[F24] = W15 = I27)³

Empedocles uses this painter analogy to show how six genuinely real entities (the four roots, Love, and Strife) can account for all the things in the world: just as painters mix colors and produce wonderful scenes, so Love and Strife combine and separate the roots and thus produce the panoply of the cosmos.⁴ The last lines of the passage (italicized above), which are relevant for the question about thought and understanding, have vexed commentators. Who is the god of the last line (and what is the force of the claim to divinity)? Three options have received fullest consideration: The god is (1) Empedocles himself, (2) Aphrodite, or (3) the Muse mentioned by Empedocles at B3 and at B4 (there is a useful discussion in Wright 1981, 181). It had been argued that any reference to Empedocles himself is impossible, for the passage seemed clearly to belong to the *Physics* but a fragment in which Empedocles refers to himself as a god or divine must have come from the *Purifications*.

The Strasbourg material shows that we cannot make such strict distinctions in classifying the Empedocles texts. Further, consideration and analysis of the concept of divinity itself is a crucial aspect of the development of Greek philosophical thought. In rejecting the traditional poetic views of the divine (with their sharp distinctions between human and divine, mortal and immortal, and the anthropomorphizing of divine bodies and activities), several of the early philosophical thinkers (especially post-Milesians) argued that knowledge was a real possibility for humans and that knowledge breaks down the distinction between mortal and immortal. The knowing human can be divine-like in this respect at least: genuine understanding – based on both perception and pure thinking – leads to insight into the way things really are, and a god’s-eye view of the cosmos. This sort of analysis can be traced to Xenophanes, Heraclitus, and Parmenides (see Curd 2011). Empedocles follows Parmenides in seeing that for a human being to know what-is is to be able to understand just as an eternal divine mind does. Note that this is not just to think *like* a god, but actually to have divine knowledge. When Empedocles explains how the two forces of Love and Strife can direct the mixing and separation of the roots to produce a world just as two painters (note the duals in the text) can produce the worlds of art from a limited number of pigments,⁵ his view is as one who genuinely knows (just as Xenophanes’ intellectual

³ I use Diels-Kranz numbers throughout, but also include the numberings from major English texts and translations: Graham 2010; Wright 1981; Inwood 1992. I have primarily followed Wright’s text, but have consulted other texts. Unless otherwise indicated, translations are my own.

⁴ Recent discussions of the fragment that I have found useful include those of Ierodiakonou 2005; Bryan, unpublished; Iribarren 2013. I am grateful to Jenny Bryan for allowing me to refer to her as yet unpublished work. See also fn. 5.

⁵ I continue to take the duals to denote two painters: Love *and* Strife are both at work here. In a detailed and subtle discussion of B23, including a close analysis of the comparisons in the fragment, Iribarren 2013 argues that the duals refer to the two hands of love; he follows Primavesi in claiming that Love alone is at work in bringing about living things (Primavesi 2008; 2011). According to Iribarren, there is no role for Strife to play in these creative acts. Further B96 and 91 “ne prêtent aucun rôle, fût-il implicite, à la Haine dans la conception des mélanges. La juste dosage des éléments fait partie de la metis zoogonique d’Aphrodite; à aucun moment le savoir-faire technique de la déesse n’implique quelque chose comme une contribution sous-entendue de la Haine” (97). Even if the main role in the formation of living things is played by Love, the mechanism behind that formation is the

divine knows and directs all things). This is not mysticism and is not “religious” in any sense except insofar as the developing Presocratic notion of divinity includes power to know and to understand beyond the limits of human immediate sensation. When B23 addresses Pausanias, urging that he must not let deception overcome his thoughts, I take it that the speaker is meant to be Empedocles himself. He speaks *as* a god because, as a knowing man, he has attained the same understanding that the divine has, thus expanding the notion of divinity to include the enlightened (knowing) human.⁶

The problem is to explain how a mortal could actually achieve this knowledge. Like Parmenides, Empedocles argues that human beings, in thrall to the sensory experiences of the moment, fail to use their divine-like capacity for thinking correctly, and so fail to grasp the underlying significance of what is sensed. Parmenides illustrates the predicament in DK28 B16:

ὥς γὰρ ἐκάστοτ' ἔχει κρᾶσις μελέων πολυπλάγκτων
τὼς νόος ἀνθρώποισι παρέστηκεν· τὸ γὰρ αὐτὸ
ἔστιν ὅπερ φρονέει μελέων φύσις ἀνθρώποισιν
καὶ πᾶσιν καὶ παντί· τὸ γὰρ πλεόν ἐστὶ νόημα.⁷

For just as is the mixture of the much wandering limbs on each occasion,
so is *noos* present to humans; for the same thing
is the very thing that cognizes – in all humans and in each: the nature of the limbs; for the full is thought.⁸

I take this to be the explanation for the warning of 28.B6.4–9, against

[...] [the path] on which mortals, knowing nothing,
wander, two headed; for helplessness in their
breast directs their wandering thought; they are carried along
deaf and blind alike, amazed, uncritical hordes
for whom to be and not to be are supposed to be the same
and not the same, and the path of all is backward-turning.

What Parmenides says in B16 is that the default human position is naïve reliance on sense perception: things are taken actually to be as they seem to perception. Parmenides argues

cosmic mixtures and separations of the roots throughout the cycles. Strife is necessary for the preparation of the ingredients (by separating former mixtures and by clumping together enough of each root to be useful to Love) and thus, I suggest, deserving of a place in Empedocles’ analogical analysis. It should be kept in mind that Love mixes (unlikes) and separates (likes) just as Strife both separates (unlikes) and mixes (likes). Because Empedocles’ system is a plenum, any mixture must involve separation (and the same for separation: it must also involve a mixture).

⁶ It may seem that my account here is designed to maintain the split between the physical and the religious aspects of Empedocles’ thought. I do not intend that. What I have suggested elsewhere is that Empedocles’ account of the cycles of the daimon and his claims about the best way to live are connected with the genuine understanding of the natural world that he, as a knower, is able to attain in the physical work.

⁷ Text as in Tarán 1964; Mourelatos 2008; Graham 2010. Bredlow 2011, 242f., 248f., suggests the Aristotelian ἐκάστοτῳ in line 1 rather than ἐκάστοτ’; he also follows García Calvo 1981 who conjectures πέλων rather than πλέων in line 4. See Tor 2015 for a clear discussion of the alternatives.

⁸ This translation (a) does not follow the exact word order of the text (more literal versions are even harder to understand); and (b) takes on Tor’s translation of φρονέει as “cognizes”. This is a good choice, as it picks up the range of abilities that humans have. Another, more awkward version might be “that is minded” (using “to mind” as a general verb of cognition). On further consideration, I now take τὸ πλεόν to mean “full” rather than “more [the preponderant]” as I in did in Curd 2011.

that humans can overcome this state, and learn to think (that is, to understand and to discriminate), not as mortals, but as the divine thinks. That is the point of the lesson of the goddess: one must learn (as she says in 28B7.5) to discern, “to judge by reasoning (κρίνειν δὲ λόγῳ)”. Just as the *kouros* can learn to overcome his mortal epistemic state, so Empedocles’ listener can learn to move beyond present sensings. I take this to be part of what is suggested in the fragments quoted by Aristotle and others:⁹

πρὸς παρεὸν γὰρ μῆτις ἀέξεται ἀνθρώποισιν.

Wisdom for humans increases in accordance with what is present. (Aristotle *Met.* 1009b17; B106 = G164[F116] = W79 = I93)

ὅσον (δὲ) ἄλλοιοι μετέφυν, τόσον ἄρ σφισιν αἰεὶ
καὶ τὸ φρονεῖν ἄλλοια παρίσταται

As much as they become changed in their nature, so too are there changed thoughts always present to them. (Aristotle *Met.* 1009b20–21; B108 = G166[F118] = W80 = I94)

Aristotle explicates these passages by saying, “Empedocles declares that a change in state (ἔξις) changes mind/thought (φρόνησις)”; he also then mentions Parmenides and quotes 28.B16. While I take these passages in Empedocles and Parmenides to be the starting point for their accounts of the possibility of divine-like human thinking and understanding, Aristotle repeatedly uses them as evidence for his claim that the earlier Greek philosophers, treated sensation and thinking as the same. So here we are at the heart of the problem with which I began: why does Aristotle assume this? First, it is worth noting that Aristotle never quotes Parmenides B6 or what I see as the relevant lines of Parmenides B7 (he quotes only the first line of B7). Further, Aristotle does not refer to the fragments, such as B2 or B3, in which Empedocles suggests that sense experience alone is not sufficient for understanding.¹⁰

The fragments that Aristotle quotes in the *Metaphysics* (Empedocles B106 and 108) suggest to him that for Empedocles sensing and thinking have the same structure: both depend on the immediate bodily presence of their objects. Thus, there can be no structural way to distinguish them.¹¹ In the case of sensation, that presence is made possible by a general theory of changes through pores and effluences. Aristotle provides a general account of Empedocles’ theory in *GC* I.8, 324b26–35:

Τοῖς μὲν οὖν δοκεῖ πάσχειν ἕκαστον διὰ τινων πόρων εἰσιόντος τοῦ ποιούντος ἐσχάτου καὶ κυριωτάτου, καὶ τοῦτον τὸν τρόπον καὶ ὄραν καὶ ἀκούειν ἡμᾶς φασι καὶ τὰς ἄλλας αἰσθήσεις αἰσθάνεσθαι πάσας, ἔτι δὲ ὀρᾶσθαι διὰ τε ἀέρος καὶ ὕδατος καὶ τῶν διαφανῶν, διὰ τὸ πόρους ἔχειν ἀοράτους μὲν διὰ μικρότητα, πυκνοὺς δὲ καὶ κατὰ στοιχόν, καὶ μᾶλλον ἔχειν τὰ διαφανῆ μᾶλλον. Οἱ μὲν οὖν ἐπὶ τινων οὕτω διώρισαν, ὥσπερ καὶ Ἐμπεδοκλῆς, οὐ μόνον ἐπὶ τῶν ποιούντων καὶ πασχόντων, ἀλλὰ καὶ μίγνυσθαι φησιν ὅσων οἱ πόροι σύμμετροι πρὸς ἀλλήλους εἰσίν.

⁹ Although this is not what Aristotle himself took the fragment to mean.

¹⁰ One possible exception: in *De Caelo* Aristotle gives B39 = G68[F40] = W33 = I46, which breaks off just where Empedocles excoriates those who make pronouncements despite having seen little of the whole (cf. B2 = G20 [F3] = W1 = I8). Nevertheless, Empedocles does not assert that sense experience is irrelevant for knowing. On B2 and B3, see below.

¹¹ I owe this way of comparing the similarity in structure of sensing and knowing to discussion with André Laks.

To some [earlier thinkers] it seems that each thing is acted upon when the last agent (the agent in the strictest sense¹²) enters in through certain pores (πόροι). They say that we also see and hear in this way and also apprehend all the other sensibles. In addition things are seen through air and water and other transparent things because they (the transparents) have pores which are invisible because of their smallness and are in close-set rows, the more so, the more transparent. Some held this sort of view, like Empedocles, not just about acting and being acted upon, but also say that mixture occurs only for those whose pores are commensurate (σύμμετροι) with one another.

The account of color that Plato's Socrates attributes to Empedocles in the *Meno* provides a precedent for Aristotle's general account of the role of pores:

Do you say that [color] is a kind of effluence of all things, as Empedocles does? And there are pores through which these effluences are carried? And some of these effluences fit into some of the pores, but some are too small or too large? You also you call something the eye (organ of vision)? [...] Then color is an effluence of shapes¹³ commensurate (σύμμετρος) with sight and capable of being sensed? [...] And at the same time I suppose you know you would, from the same [account] be able to say also what sound is, and smell, and many other things of that sort. (Plato, *Meno* 76c7ff. DKA92a; Meno's affirmative answers omitted)

Here Plato gives the same account of pores and effluences, and specifically in the context of sight and color sensation,¹⁴ that Aristotle attributes to Empedocles. Other evidence for a general theory of pores and effluences include B89 and its context (in a discussion of why the octopus changes color), A89 (on magnets), and A88 (on mirrors). These reports are consistent with extant texts:¹⁵

σκόπει δὴ κατ' Ἐμπεδοκλέα γνούς, ὅτι
πάντων εἰσὶν ἀπορροαί, ὅσ' ἐγένοντο [...] (B89)
οὐ γὰρ ζώων μόνον οὐδὲ φυτῶν οὐδὲ γῆς καὶ θαλάττης, ἀλλὰ καὶ λίθων ἄπεισιν ἐνδεδεχῶς
πολλὰ βεύματα καὶ χαλκοῦ καὶ σιδήρου

Consider, then, with Empedocles, and recognize that

“there are effluences of all things, as many as have come to be” [...]

These come not only from animals or plants, or earth, or sea, but also continually flowing from stones, and copper, and iron [...] (Plutarch, *Nat. Questions* 916D = B89)

Concerning the reason that the stone of Heracles moves iron: Empedocles says that the iron carried to the stone because of the effluences from both and because the pores in the stone are commensurable (σύμμετροις) with those from the iron. (A89 = G117)

Empedocles says that [reflection in a mirror occurs] on account of effluences have been brought together on the surface of the mirror, compressed by the fiery stuff that separates from the mirror, and borne into the air in front into which the streams are transferred. (Aëtius 4.14.1 = A88 = G172)

In *De Anima* III.3 Aristotle begins to distinguish various capacities of soul that are different from sensation/perception. He introduces *phantasia*, contrasting it with active sensing,

¹² In GC I.7 Aristotle argues that change involves an active agent and a passive subject of change. Natali 2004 provides a detailed analysis of the argument.

¹³ Reading σχημάτων with Burnet's OCT.

¹⁴ There is something strange about this exchange, offered as a supposedly accurate account of Empedocles' view. First, Socrates says he is going to answer Meno, not speaking as Empedocles does, but “in the manner of Gorgias (κατὰ Γοργίαν)”. Then, when, in response Meno says, “You seem to me to have given an excellent answer”, and Socrates promptly replies (dismissively), “That is because it is in tragic style” (Τραγικῆ γὰρ ἔστιν [...] ἢ ἀπόκρισις). See fn. 20 below.

¹⁵ Pores/channels: B2, B84?; effluences: B89, implied in B102; likeness: 90; path of song: B35; breathing: B100.)

while in III.4 he turns to knowledge and understanding and in III.5 goes on to discuss *nous*.¹⁶ At 427a17ff. (in III.3) this sustained discussion begins with a mini-history:

There are two differentiae in accordance with which most people define the soul: (1) change of place and (2) thinking, judging, and perceiving, and it seems that thinking and judging are a sort of perceiving (for in both of these the soul distinguishes and recognizes something of the things that are); the ancients say that thinking and perceiving are the same, for instance Empedocles said [...]. [B106 and B108] For they all take thinking as bodily just like perceiving (πάντες γὰρ οὔτοι τὸ νοεῖν σωματικόν ὡσπερ τὸ αἰσθάνεσθαι ὑπολαμβάνουσιν) and that both perceiving and knowing are the like by the like, as we explained in our first discussion [i. e., in *De Anima* I.2].

Aristotle makes two claims that are important for the interpretation of Empedocles that he and Theophrastus adopt. First, there is the claim that all the earlier thinkers take thinking to be a bodily state (σωματικόν) and hence like perceiving.¹⁷ Second, there is the assimilation of perception (of likes by likes) to knowledge (and hence knowledge is of like by like). The first claim, that thinking is a state of the body is one that Aristotle seems to accept without question; I suggest that it falls out of his presupposition (explicit in *Metaphysics* A, 983b6ff.) that “among the first to philosophize, most thought that the first principles of all things were in the form of matter alone [...] (τῶν δὲ πρώτων φιλοσοφησάν οἱ πλείστοι τὰς ἐν ἄλλης εἶδει μόνας ᾤθησαν ἀρχὰς εἶναι πάντων)”. Given Aristotle’s commitment to his matter-ist historical account, and given the prominence of pores in the Empedoclean analysis of perception, it would be, for Aristotle, obvious that Empedocles could have no independent non-bodily account of thinking and understanding. Indeed in *De Anima* I.2, to which he alludes in III.3, Aristotle quotes fragment 109, in which Empedocles asserts that it is by Love that we see Love and by Strife that we see Strife. Aristotle also quotes B109 at *Met.* 1000b6 where he uses it as evidence that the Sphere is less knowledgeable than other things, because, lacking strife, it cannot know strife.¹⁸

Theophrastus, saying more about the pores, goes on in A86 to raise questions, finding Empedocles’ account of pores incomplete and inconsistent:

Empedocles gives a similar account of all the senses and says that sense-perception occurs by means of [things] fitting into the pores of each [sense-organ]. That is why they cannot discern each other’s objects, because some senses happen to have pores which are somehow too wide for the for the object of perception, while others have pores which are too narrow, so that the objects which do not touch are able to go right through and the others are completely unable to get in [...]. (*De Sensibus* 1.7: A86 = G168)

¹⁶ Kamtekar 2009, 221: In “Aristotle, thinking involves non-perceptible properties in a way that perception does not, and while perception requires the presence of the object of perception, thought (and in a different way imagination) are distinctively different from perception in that they do not.” For a recent discussion of the activity of thinking in Aristotle, see Corcilius 2009.

¹⁷ Lee 2005, 139, states succinctly: Aristotle’s “charge is not that his predecessors lacked any conception of higher reflective knowledge [...] Rather Aristotle’s claim is that his predecessors thought that knowing and thinking are like perceiving in significant ways (DA427a26–29). He is concerned with the way his predecessors explain how thinking occurs; their understanding [...] is in some way based on and explanatorily posterior to their understanding of how perceiving occurs”.

¹⁸ That Aristotle does not even pause here to consider the implications of this fragment is further evidence that he takes Love and Strife to be themselves bodily in some way.

Theophrastus, relying on B107, also links knowledge and sensation; the mixture of the roots suggested in B107 is taken by Theophrastus (*de Sensibus* 10) to explain why “we think particularly with the blood”, although he is probably also alluding to B105’s connection of thinking with the blood around the heart:

[Empedocles] speaks in the same way about knowledge and ignorance; for knowledge is by similars, ignorance by dissimilars, as knowledge is either the same as or very close to perception (ἢ ταῦτόν ἢ παραπλήσιον ὃν τῆ αἰσθήσει τῆν φρόνησιν). Enumerating how we recognize each thing by itself, he adds in conclusion [B107]. And that is why thought is especially by the blood: for in it the elements more mixed than in any [other] part (διὸ καὶ τῷ αἵματι μάλιστα φρονεῖν ἐν τούτῳ γὰρ μάλιστα κεκρᾶσθαι [ἔστι] τὰ στοιχεῖα τῶν μερῶν).

In his wider discussion of Empedocles, Theophrastus also explicitly raises objections implied by the principle that sensation is of like by like and by a general theory of pores: Why is it that apparently only humans think? Why do not parts of animals, like hair, think, insofar as they too are made of all the roots and would presumably have the same porous structure?¹⁹ After all, B91 (water and oil do not mix) is explained by Philoponus this way:

[...] [Empedocles says] of those things of which the firm parts and pores (i. e., the hollows and dense parts) are commensurate (σύμμετρα), so that they make room for one another, there is mixture and blending, for instance of water and wine; of those [whose parts] are incommensurate (ἄσύμμετρα), he said that they do not mix, for instance, water and oil for he says, “water is more easily fitted with wine, but is not willing with oil”. He says this with respect to all bodies and gives it as the explanation of the sterility of mules. (Context and B91; Philoponus *in GA* 123.15)

Yet, given the [relative] abundance of testimonia that explicitly mention pores and effluences, it is odd that those terms rarely occur in the extant fragments. Rather, Empedocles most often speaks of springs, channels, funnels, and flowings (see Picot 2004 and 2009; see also fn. 26). These terms obviously get transformed into the familiar pores and effluences, but in a way that may not do justice to the subtlety of Empedocles’ view; for it is not clear that he wishes to explain the mechanics of color and sound sensation and also mixture (and failure to mix) and breathing all by exactly the same mechanism. I suspect that the color passage in the *Meno* is one of the main sources behind the Aristotelian and Theophrastean interpretations.²⁰ This suggests that an expansive theory of pores and effluences, covering all sense experience and knowledge (along with other bodily activities like breathing) as found in the testimonia, may be an artifact of the early discussions of Empedocles. In particular the *Meno* probably influenced the views of both Aristotle and Theophrastus, which, in turn, are carried on through the doxography. In addition, Aristotle’s fundamental

¹⁹ For Theophrastus, these questions suggest the absurdity of Empedocles view. In sections 12 to 24 Theophrastus raises difficulties Empedocles’ view, concluding his discussion by saying, Ἐμπεδοκλῆς μὲν οὖν ἔοικεν ἐν πολλοῖς διαμαρτάνειν. Note that Empedocles himself is willing to attribute perception and thought to all things (more on this below).

²⁰ There are also the opening lines of Aristophanes’ *Thesmophoriazusae* which puts a nice parody of Empedocles’ view into the mouth of Euripides. See Rashed 2007, 27–9. (Sansone 1996, 345 suggested that Socrates refers to the Empedoclean definition of color as “tragic” because it was taken over by (the real) Euripides and then parodied by Aristophanes: “It is widely recognized that Euripides’ tragedies frequently reflect contemporary scientific speculation. And if Euripides has put a version of this novel theory of perception into the mouth of one of his characters, that would account both for the presence of Aristophanes’ parody and for Socrates’ description of the theory as ‘tragic’.”) Plato, of course, would have been familiar with Empedocles’ own theory, but that need not have prevented him from having Socrates make fun of Meno as he does.

commitment to the view that matter must be the sole first principle for earlier thinkers (with its consequences for his accounts of perception) is further reason to re-examine Empedocles' views on sensation, perception, and knowledge without worrying that the resulting view may not cohere completely with the interpretations of Aristotle, Theophrastus, and others. For example, in the context of B91 (above) Philoponus is commenting on Aristotle *GA* II.8 747a24ff., on the question of why mules are sterile. In that passage Aristotle refers to the density and softness of the seed in the relevant cases, without actually mentioning pores, but Philoponus unhesitatingly equates Aristotle's use of "firm" and "hollow" with a general theory of pores.

I have suggested that Empedocles distinguishes among sensing, perceiving and knowing (or understanding). I now turn to some evidence:

στεινωποὶ μὲν γὰρ παλάμαι κατὰ γυῖα κέχυνται·
πολλὰ δὲ δεῖλ' ἔμπαια, τὰ τ' ἀμβλύνοουσι μέριμνας.
παῦρον δ' ἐν ζωῆσι βίου μέρος ἀθρήσαντες
ὠκύμοροι καπνοῖο δίκην ἀρθέντες ἀπέπταν
αὐτὸ μόνον πεισθέντες, ὅτω προσέκυρσεν ἕκαστος
πάντοσ' ἔλαυνόμενοι, τὸ δ' ὄλον (πᾶς) εὐχεται εὐρεῖν.
οὕτως οὐτ' ἐπιδερκτὰ τὰδ' ἀνδράσιν οὐτ' ἑπακουστά
οὔτε νόω περιληπτὰ [...] σὺ δ' οὖν, ἐπεὶ ὧδ' ἐλιόσθης,
πεύσειαι οὐ πλέον ἢ βροτείη μῆτις ὄρωρεν.

For narrow fingers flow through the limbs,
and many wretched things burst in, and blunt their thoughts.
Observing but a small portion of life in their living
quick-dying, like smoke they are lifted up and wafted away to their doom. Each one being
persuaded only by that which he has chanced to meet,
they are driven in all directions, yet each exults in having seen the whole.
These things are neither such as to be visible to [mortal] men, nor heard,
nor grasped with mind; [...] but you, since you have turned aside here,
will learn as far as mortal acumen can go. (B2 = G20 [F3] = W1 = I8)

Plutarch quotes only lines 7 and 8 (*aud. poet.* 17e), linking them with Xenophanes B34 as evidence that genuine truth is difficult to obtain. Sextus, our source for the whole fragment, first quotes lines 1–8a; he then reports that some say “that according to Empedocles, the criterion of truth was not the senses, but right reason, and that one kind of right reason was divine, the other human”. Then, adding his view that the divine is unattainable, Sextus, quoting the last lines, adds “yet truth is not completely beyond our grasp”. That is Empedocles' point: being too reliant on the momentary evidence of the senses, and being distracted by the business of living, most humans pay attention only to their own experience and so fail to use correctly their capacities for thought and understanding. Pausanias, addressed in the passage, is an exception, like Empedocles himself (see B23). Having “turned aside” (i. e. having turned his attention to what Empedocles has to teach), he shall learn and know as far as is possible (i. e. beyond the usual range of unenlightened and inattentive mortals). This is a view of mortal faculties familiar from Heraclitus (22B1, B2) and Parmenides (28B1, B6, B7, B16) (it also appears in Anaxagoras 59B17).²¹ In all

²¹ Parmenides seems to distinguish between mortals and human beings. Being “mortal” in the sense that Parmenides refers to (accepting, on the basis of experience, the reality of coming-to-be and passing-away and of real change

these cases, the ordinary mortal condition is one of willful complicity in ignorance through failure to exercise capacities that could lead to genuine and hence divine-like knowledge. Like Heraclitus and Parmenides, Empedocles acknowledges the difficulty for humans of coming to know. His B2 (just quoted) holds out the promise of knowledge but does not yet explain how humans are to acquire it, a tactic also familiar from Heraclitus. Heraclitus cautioned against the unconstrained reliance on sense experience (“Eyes and ears are bad witnesses for those with barbarian souls” [22B107]); but he also notes that for humans sense experience is a necessary component of understanding (22B55). Here Empedocles agrees. In B3b, Pausanias is exhorted to maintain a modest position with respect to his own knowledge, but to be enthusiastic in the learning of it, and to use whatever tools for understanding are available, including the senses:

μηδέ σέ γ' εὐδόξιο βιήσεται ἄνθεα τιμῆς
 πρὸς θνητῶν ἀνελέσθαι, ἐφ' ᾧ θ' ὅσῃς πλέον εἰπεῖν
 θάρσει – καὶ τότε δὴ σοφίης ἐπ' ἄκροισι θοάζειν.
 ἀλλ' ἄγ' ἄθρει πάσῃ παλάμῃ, πῆ δῆλον ἕκαστον,
 μήτε τιν' ὄφιν ἔχων πιστὴν πλέον ἢ κατ' ἀκουήν
 ἢ ἀκοήν ἐρίδουπον ὑπὲρ τρανώματα γλώσσης,
 μήτε τι τῶν ἄλλων, ὅποσῃ πόρος ἐστὶ νοῆσαι,
 γυίων πίστιν ἔρυκε, νόει δ' ἤ δῆλον ἕκαστον.

Do not be forced to take up from mortals the blossoms of
 well-famed honor, on condition that you recklessly say more than is holy
 and then sit on the heights of wisdom.

But come, gaze on each thing with every device by which it is clear,
 not holding any seeing as more trustworthy than hearing,
 nor resounding hearing beyond what speech makes clear;
 nor in any other way withhold trust from any limb by which there is a passageway for understand-
 ing, but understand each in the way that it is clear.

(B3 [lines 6–13²²] = G21[F4] = W 5 = I14)

Here Empedocles explicitly mentions a *πόρος νοῆσαι*, a passageway for knowing, and he clearly means to refer to sensing as necessary for understanding. Nevertheless, it seems clear that sensing alone is not sufficient for knowledge, and that the reference to passageways is not meant to limit knowledge acquisition to sensing. Pores indeed have a role to play in sensation, but not all cognition is sensing through pores.

The double story introduced in B17 cannot be taken as an extrapolation from sense experience alone; this is because it describes the cosmic state as it unfolds, including the roots, Love and Strife, and the entire cosmic cycle, both before and after there could be mortal sentient beings. Moreover, Empedocles makes clear that Love and, presumably, Strife are not to be observed directly but are known only by looking with the mind's eye at the results of their actions. Indeed, trying literally to see Love or Strife with the eyes is

in the nature of a thing) is a state that one can escape. The *kouros* is a human being but learns to stop thinking like a mortal because, having worked through the reasoning given by the goddess, he now knows the truth about what-is.

²² As often noted, the first part of what Diels gives as B3 is addressed to the Muse, but the later lines (given here) are addressed to Pausanias. Either Sextus quotes as a single passage what were two separate passages, or he has omitted some lines without noting that he is doing so. Inwood 1992 separates the text into two fragments (his 9 and 14). See the discussion in Wright 1981, 157 and 160f.

self-defeating; rather we can only come to see them in the sense of understanding that they are present and how they operate in the world:

τὴν σὺ νόῳ δέρεαι, μηδ' ὄμμασιν ἦσο τεθηπῶς·
 ἦτις καὶ θνητοῖσι νομίζεται ἔμφυτος ἄρθροις,
 τῇ τε φίλα φρονέουσι καὶ ἄρθμια ἔργα τελοῦσι,
 Γηθοσύνην καλέοντες ἐπώνυμον ἦδ' Ἀφροδίτην·
 τὴν οὐ τις μετὰ τοῖσιν ἐλισσομένην δεδάηκε
 θνητὸς ἀνὴρ.

And you gaze on her (Love) with your mind; do not sit idle with dazed eyes;
 She is deemed even by mortals to be inborn in the joints,
 by her they think loving thoughts and accomplish harmonious deeds,
 calling her names Joy and Aphrodite;
 no one of mortal man has perceived her whirling among them [the roots].
 (B17.21–26 = G41/F20 = W8 = I25)

Several scholars have rightly understood this claim to indicate that we can give an alternate and better interpretation of the very passage cited by Aristotle to support his own correlation of perception and thought (*de An.* 404b8):

Γαίη μὲν γὰρ γαῖαν ὀπώπαμεν, ὕδατι δ' ὕδωρ,
 αἰθέρι δ' αἰθέρα διον, ἀτὰρ πυρὶ πῦρ ἀίδηλον,
 στοργὴν δὲ στοργῆ, νεῖκος δὲ τε νεῖκει λυγρῶ.

By earth we discern earth, by water water,
 by aether divine aether, and by fire destructive fire,
 By affection affection, and strife by baneful strife. (B109 = G158[F110] = W77 = I17)

Just as we are aware of the reality and roles of Love and Strife indirectly through awareness of and thought about their activities in ourselves and in the larger world, so we become aware of the nature and reality of the roots by analyzing their roles in the world around us.²³ B109 uses seeing (*ὀπώπαμεν*) as an image of coming to understand through the experience of mixtures of the roots. We cannot perceive pure instances of the roots, for they are always (at our point in the cosmic cycle) mixed with one another in compounds. The only times at which there are pure stretches of roots would be just before, during, and after the triumph of Strife, and at those periods there is not enough mixture for human or other beings to exist.

Empedocles introduces the roots with divine names:²⁴

²³ Sedley 1992, 28, adopts a semi-literal interpretation of this fragment as an account of the mechanism of sensation and hence understanding: “Now it is very nearly certain that Empedocles is here explaining the combination of elements that makes up the blood which in turn constitutes the seat of thought. Each element in the blood ‘sees’ its like, but in the sense of grasping or comprehending it, rather than literally seeing it”. I think the passage refers purely to understanding and is not concerned with the makeup of blood and its role in thinking. It is through the analysis of the roots and Love and Strife (and that analysis begins with but is not limited to sense-perception) that we come to understand their roles in the make-up of the world and ourselves.

²⁴ Scholars (both ancient and modern) disagree about what name refers to which root (and whether it makes a difference to interpreting Empedocles). For discussions of alternatives (and why the names are important) see Wright 1981; Picot & Berg 2013; Picot 2014; Kingsley 1994; Rowett 2016

τέσσαρα γὰρ πάντων ριζώματα πρῶτον ἄκουε·
 Ζεὺς ἀργῆς Ἥρη τε φερέσβιος ἠδ' Ἀιδωνεύς
 Νῆστις θ', ἣ δακρῦοις τέγγει κρούνωμα βρότειον.

Hear first the four roots of all things:

Bright Zeus, life-bringing Hera, Aidoneus,
 and Nestis, who with her tears moistens the mortal spring. (B6 = G26/F9= I12 = W7)

Then, in B17, B26, and B21, Empedocles amplifies his initial statement. In case we have misunderstood him, he shows how the fundamental roots themselves are manifested as particular mixtures in which their characters dominate:

ἀλλ' ἄγε, τόνδ' ὁάρων προτέρων ἐπιμάρτυρα δέρκευ,
 εἴ τι καὶ ἐν προτέροισι λιπόξυλον ἔπλετο μορφῆ,
 ἥελιον μὲν λαμπρὸν ὄραν καὶ θερμὸν ἀπάντη,
 ἄμβροτα δ' ὅσ' εἶδει τε καὶ ἀργέτι δεύεται αὐγῆ,
 ὄμβρον δ' ἐν πᾶσι δνοφόντά τε ριγαλέον τε·
 ἐκ δ' αἴης προρέουσι θελεμνά τε καὶ στερεωπά.
 ἐν δὲ κότῳ διάμορφα καὶ ἄνδιχα πάντα πέλονται,
 σὺν δ' ἔβη ἐν φιλότῃ καὶ ἀλλήλοισι ποθείται.
 ἐκ τῶν γὰρ πάνθ' ὅσα τ' ἦν ὅσα τ' ἔστι καὶ ἔσται ὀπίσσω,
 δένδρεά τ' ἐβλάστησε καὶ ἀνέρες ἠδὲ γυναικες,
 θῆρές τ' οἰωνοὶ τε καὶ ὕδατοθρέμμονες ἰχθύς,
 καὶ τε θεοὶ δολιχαίωνες τιμῆσι φέριστοι.
 αὐτὰ γὰρ ἔστιν ταῦτα, δι' ἀλλήλων δὲ θέοντα
 γίγνεται ἀλλοιωπά· τόσον διὰ κρήσις ἀμείβει.

But come, gaze on this witness to my words,
 if something in the earlier ones was deficient in form:

the sun bright to look on and hot in every way,
 and immortals [heavenly bodies] drenched in heat and shining light.
 And stormy showers, in everything dark and chilling;
 and there flow from earth things dense and solid.
 And in rancor all are differently-formed and separate
 but they move in step in love and yearn for one other.
 From these all things, as many as were and are and will be hereafter,
 have sprung: trees and men and women
 and wild beasts and birds and water-nourished fish,
 and also long-lived gods highest in honor.

For just these very things are, and running through each other
 they change appearance, for they change about through blending. (B21 = G45[F22] = I26 = W14)

The natural world as it is now is the reliable witness that supports Empedocles' claims. Although the genuine realities that constitute the sensible world are not directly available to sensing (because all that we see are the results of mixture and separation), the Earth itself (on which we live), as well as the sun and other heavenly bodies and the water of rain and storm, are testimony to the presence of the roots. As in B109 the familiar forces of love and strife that we feel are at work, and from just these things (the only things that are genuinely real) come all the wonders of mortal life itself, without the ingredients and forces losing their natures or their fundamental status. In addition, Empedocles clearly distinguishes the character of the divine and how one comes to know it from the nature of the sensible world and perception's role in grasping that nature.

οὐκ ἔστιν πελάσασθαι ἐν ὀφθαλμοῖσιν ἐφικτόν
 ἡμετέροις ἢ χερσὶ λαβεῖν, ἥπερ τε μεγίστη
 πειθοῦς ἀνθρώποισιν ἀμαξιτὸς εἰς φρένα πίπτει.

It is not attainable to approach it [the divine] with eyes
 or grasp with our hands, through which indeed the greatest
 road of persuasion for humans leads to the mind.
 (B133 = G194[F139] = I109 = W96)

οὐδὲ γὰρ ἀνδρομέτῃ κεφαλῇ κατὰ γυῖα κέκασται,
 οὐ μὲν ἀπαι νώτοιο δύο κλάδοι αἰσσοῦσι,
 οὐ πόδες, οὐ θοὰ γοῦν', οὐ μήδεα λαχνήεντα,
 ἀλλὰ φρὴν ἱερὴ καὶ ἀθέσφατος ἔπλετο μοῦνον,
 φροντίσι κόσμον ἅπαντα καταἰσσοῦσα θοῆσιν

For he is not fitted out with a human head on his body
 nor from his back do two arms sprout.
 nor feet, nor swift knees, nor hairy genitals.
 But he is only a holy and ineffable mind,
 with swift thoughts darting throughout the entire cosmos.
 (B134 = G195[F140] = I110 = W97)

These basic parts of Empedocles' system cannot be the objects of sensation because they are not themselves the sorts of things that can be sensed. In that way they are like the number four or the concept of courage. We cannot sense those things: we see only four apples or come to recognize that an action is courageous. In this we move from sensing (having apple-sensations or seeing the person picking up a child as a car approaches) to perceiving (seeing these as) *four* apples in a group, or recognizing that a child has been rescued from a dangerous situation. We may then reflect on and think about that experience and (perhaps eventually) come to have knowledge about the number four and about courage itself. This is a necessary part of the process that leads to genuine understanding. Understanding, then, is a cognitive process that involves analysis and mindful epistemic judgment, and cannot be reduced to the state of the blood.

ἀλλὰ κακοῖς μὲν κάρτα πέλει κρατέουσιν ἀπιστεῖν·
 ὡς δὲ παρ' ἡμετέρης κέλεται πιστώματα Μούσης,
 γνῶθι διατμηθέντος ἐνὶ σπλάγχχοισι λόγιο.

But surely ignoble men distrust what is most authoritative;
 but you, as the warrants of our Muse bid,
 know, thoroughly dividing [analyzing] the account in your heart.
 (B4 = G24 = W6 = I3)

ὄλβιος δὲ θεῶν πραπίδων ἐκτήσατο πλοῦτον,
 δειλὸς δ', ᾧ σκοτόεσσα θεῶν πέρι δόξα μέμηλεν.

Blessed is he who has procured wealth in his divine thinking organs²⁵
 but wretched the one who adopts an unenlightened belief about the gods.
 (B132 = G193[F138] = W95 = I4)

While he castigates the unenlightened who are distracted by what he calls the myriad mean and trivial things of life, Empedocles also assures us that knowledge (as understanding)

²⁵ Πραπίδες: cf. B129 and B110.

once properly attained by analysis and commitment will remain, and not be forgotten, escape, or “fly off like smoke”.

εἰ γὰρ κέν σφ' ἄδινῆσιν ὑπὸ πραπίδεσσιν ἐρείσας
 εὐμενέως καθαρῆσιν ἐποπεύουσι μελέτησιν,
 ταῦτά τέ σοι μάλα πάντα δι' αἰῶνος παρέσσονται,
 ἄλλα τε πόλλ' ἀπὸ τῶνδε κτήσεαι· αὐτὰ γὰρ αὖξει
 ταῦτ' εἰς ἦθος ἕκαστον, ὅπῃ φύσις ἐστὶν ἐκάστῳ.
 εἰ δὲ σύ γ' ἄλλοίων ἐπορέξεαι, οἷα κατ' ἀνδρας
 μυρία δειλὰ πέλονται ἅ τ' ἀμβλύνοουσι μερίμνας,
 ἦ σ' ἄφαρ ἐκλείφουσι περιπλομένοιο χρόνοιο
 σφῶν αὐτῶν ποθέοντα φίλην ἐπὶ γένναν ἰκέσθαι·
 πάντα γὰρ ἴσθι φρόνησιν ἔχειν καὶ νόματος αἴσαν.

For if, planting these [teachings] firmly down in your crowded mind
 you keep watch on them, kindly, with pure thoughts,
 they will surely accompany you throughout all ages,
 and you will gain many others from them, for these will grow
 into each character in that way which is the nature of each.
 But if, indeed, you reach out for others, such as
 the countless wretched things that come among men and blunt the thoughts,
 they will straightaway abandon you as the time rolls round,
 yearning to reach their own beloved kind.
 For know that all things have intelligence and a share of thought.
 (B110 = G22[F5] = W100 = I16)

Empedocles asserts that knowledge increases incrementally, as we add to our store of understanding; the more that we experience and the more fully and carefully we analyze, the more we will be able to know.²⁶ This additive aspect of coming to understand is what B106 (used by Aristotle to equate sensing and knowing) really means: “Wisdom for humans increases in accordance with what is present (πρὸς παρεὸν γὰρ μῆτις ἀέξεται ἀνθρώποισιν)”. Perhaps Aristotle, leaning on the biological image here, might argue that “planting these [teachings] firmly down in your crowded mind (ὑπὸ πραπίδεσσιν)” is itself

²⁶ We may add to this B143 (in Diels’s version: κρηνάων ἅπο πέντε ταμόντ’ (ἐν) ἀτειρέι χαλκῶι [...]), accepting Picot’s claim in Picot 2004, 406f., and 2009, based on his detailed examination of the Venice manuscript of Theon of Smyrna’s *Expositio rerum mathematicarum ad legendum Platonem utilium* (the source of the fragment), along with an analysis of the history of the editing of the text, that the “(ἐν) ἀτειρέι χαλκῶι” of Diels’s B143 are not genuinely part of the fragment (although “χαλκῶι” may be genuine and that its proper place is the line, or if it even belongs to the same line in unknown). This leaves (in Picot’s version) κρηνάων ἅπο πέντε ταμών, “having drawn off from five springs”. Picot argues that the “five springs” are the five sense organs which are the sources of sensation; “cutting off from” or “drawing off from” is should be understood as an image of irrigation and farming: the sensations flowing in “irrigate our thought” which is in the blood around the heart (Picot 2009, 74; his brief summary of the position in Picot 2004). The context in Theon is a discussion of purification, but it is purification in the service of learning and knowledge. The Empedocles fragment emphasizes “five springs” and the Plato material from the *Republic*, also part of Theon’s discussion, speaks of the role of the five mathematical sciences in preparing the rulers. Picot thus argues that the fragment belongs with the other epistemological fragments: using and analysing properly the evidence of the senses adds to one’s knowledge. Picot 2004, 432, argues that “Dans le fr. 143 l’Agrigentain invite à faire converger des effluves qui souvent divergent, à faire une synthèse des données des sens. Mais cette synthèse se fait dans la cadre des principes acquis par l’enseignement [...]. Il ne s’agit donc pas seulement d’agréger des données. Il faut les organiser”. Picot 2009 amplifies and refines the discussion of B143 (and adds a discussion of B100).

a bodily phenomenon. Long (who accepts the matterist account, at least for the physical doctrines) says, “One thing is quite clear: there is no evidence that thinking depends on the data provided by the sense organs and it seems unlikely that Empedocles saw any causal relation between sense-perception and thinking”. Long 1966, 268, refers to B110 and also points out that Empedocles “did not trace the way of perception from the sense organs to the blood and the heart as Alcmaeon traced it to the brain”; the teachings that are planted firmly just are the elements themselves.²⁷ After all, Empedocles says:

αἷματος ἐν πελάγεσσι τεθραμμένη ἀντιθορόντος,
τῇ τε νόημα μάλιστα κικλήσκειται ἀνθρώποισιν·
αἷμα γὰρ ἀνθρώποις περικάρδιόν ἐστι νόημα.

[...] nourished in seas of blood surging to and fro,
there is what humans especially call thought;
since, for humans, blood around the heart is thought.
(B105 = G163[F115] = W94 = 196)

If we interpret this as Aristotle would, Empedocles is saying that thinking just is the blood around the heart being in one state or another (Long 1966, 268–72, accepts this view). This could be supported by claiming that the recipe for blood provides the best mixture possible for human thought, as the mixture to the ratio of 1:1:1:1 of earth, water, air, and fire (the recipe for blood and flesh in B98) most closely resembles the complete mixture of the Sphere (the holy *phrên*).²⁸ If we accept, with Aristotle, that Empedocles was a thoroughgoing matterist, then, there can be no question about the nature of thought. Again, Long’s interpretation (1966, 268) is instructive: “Empedocles” concentration on the material basis of consciousness is so strong that one answer to the question, “What is thinking in men?” seems to be “Thinking *is* the blood round the heart”.²⁹

Nevertheless B110 shows that Empedocles is also committed to the view that “all things have intelligence and a share of thought”; however we understand *that* claim it is not true that all things have blood.³⁰ The state of the pericardial blood may affect how well we humans think, but it is not to be identified with thinking itself. Moreover, note that Empedocles asserts that the pericardial blood is what humans especially (*malista*) call thought, and that *for them* (*anthropoisin*) thought is this blood.³¹ Stobaeus, our source for

²⁷ It should be noted that Long’s classic article was published in 1966, well before the Strasbourg papyrus evidence was available, and at a time when the “Empedocles as rationalist or mystic?” debate was in full swing. In this article Long supports Vlastos’ claim that mental processes are to be reduced to ratios of the roots.

²⁸ Wright 1981, 62, connects the ratio with the activity of Love, “and the best arrangements, those coming most closely to a 1:1 ratio when Love is least hindered by Strife” so blood is closest to the complete mix of the holy *phrên*.

²⁹ Kamtekar 2009 responds directly to many of Long’s claims in arguing for a “mentalist” (her term) interpretation of Empedoclean thinking.

³⁰ It might be that the prohibition of bloodshed in sacrifice and meat-eating is evidence that blood is indeed the organ of thought. But if all things think and have a share of intelligence, then all plants, too, should be protected (not just beans).

³¹ See Barnes 1979, II, 183f: “Empedocles does not say that it is the blood which thinks; nor does he say that the heart, or the heart’s blood, is the sole organ or instrument of thought; the heart is of pre-eminent importance, but it is only the place where ‘especially’ we think. Heart’s blood is a peculiarly fine mixture of the elements; since [...] each of the elements is an organ or instrument of thought, then heart’s blood is a peculiarly fine cognitive medium”.

the fragment (he gets the entire passage from Porphyry), says that “Homer thinks that for men thought about mortal things is in the blood (τὴν περὶ τὰ θνητὰ φρόνησιν)”. Wright helpfully paraphrases the bridge passage that is omitted in the DK version of the context: “the cognitive function of the concentration of blood around the heart is connected to Homeric evidence that the heating of the heart-blood in anger results in temporary loss of reason”.³² Stobaeus/Porphyry then add (with our passage) that Empedocles too “*seems to speak* of the blood as being the organ of understanding (φαίνεται ὡς ὄργάνου πρὸς σύνεσιν τοῦ αἵματος ὄντος λέγειν)”. Note also that in B3b, the exhortation is: Do not “withhold trust from any limb [of the body] by which there is a passageway (πόρος) for understanding (νοῆσαι), but understand (νόει) each in the way that it is clear”. Despite what seems to be an absence of Alcmaeon-like explanatory claims about pores, it seems reasonable to suppose that rather than claiming that thought is the blood, Empedocles would suppose that blood is the medium through which sensory messages are sent to a central processing center for evaluation, judgment, and thought, those non-bodily cognitive capacities discussed above. In addition, the images of planting and growth in B110 suggest that the ideas planted produce more ideas. The growing of our own knowledge include our working out of the implications of things we already know. Empedocles does not, of course, intend to refer to processes of deduction and induction here, but that could be a way to “keep watch on [these teachings] kindly, with pure thoughts, [so that] they will surely accompany you throughout all ages”.

I now return to the mechanism of sensation. As noted above, sight and hearing both involve pores, passageways, and funnels. The effluences of the sense-object enter the relevant pores (for only they will fit) and the content is then carried by the blood to the central receiving center for interpretation. The extant texts provide most evidence for sight and sound, and there are a few fragments about smell and odor (see B102). Theophrastus noted the discrepancy in treatment, too, as he says in A86, “Concerning taste and touch he does not offer definitions of either individually: neither of how or on account of what they take place, except the general notion that perception is by the harmonious fitting into pores”. A lovely example occurs in a short fragment about the olfactory abilities of [non-human] animals:

κέρματα θηρείων μελέων μυκτῆρσιν ἔρυνῶν [...]
 [...] ἀπέλειπε ποδῶν ἀπαλῆ περὶ ποίη [...] ³³

Tracking with nostrils fragments of animal bodies
 [...] left from their paws on the soft grass (translation Wright 1981)
 (B101a and b = G159, 160 [F111a, F111b] = W92 = I107)

The snuffing up of scents suggests that olfactory effluences can not only move through the air (as do effluences for sights and sounds) but can be motionless sheddings from an object (and this suggests that touch and taste also work this way).³⁴ As usual, Empedocles does not give us a direct explanation; rather he uses examples and similes. His method

³² Wright 1981, 250; Porphyry *On Styx*, in Stobaeus *Eclog.* 1.49.53 = context of B105.

³³ Wright 1981, 129f. and 249, discusses the difficulties of the text.

³⁴ The difficulties of making sense of early Greek theories that include effluences are explored by Burkert 1977, who, while concentrating on Democritus, also discusses Empedocles.

suggests that coming to understand always involves interpretation of evidence and that knowledge cannot be read off directly from the evidence (i. e. that even the perception of sensory information is a mediated process). This cannot be reduced to effects of the roots on the body, for then Theophrastus' question becomes relevant: As everything is a mixture of the roots, why does not everything perceive everything else all the time? One answer is that, according to Empedocles, there is a sense in which this is exactly what happens, since all things have a share of thought and awareness. But in another sense, it is not just the stuffs themselves that are relevant: it is the arrangement and interaction of the sensed with the arranged stuffs in each sensing thing. The most famous example is the account of the construction of the eye (see Rashed 2007):

- ὡς δ' ὅτε τις πρόοδον νοέων ὠπλίσατο λύχνον
 χειμερίην διὰ νύκτα, πυρὸς σέλας αἰθομένοιο,
 ἄφας παντοίων ἀνέμων λαμπτήρας ἀμοργούς,
 οἷ τ' ἀνέμων μὲν πνεῦμα διασκιδνάσιν ἀέντων,
 φῶς δ' ἔξω διαθρώσκον, ὅσον ταναώτερον ἦεν,
 λάμπεσκεν κατὰ βηλὸν ἀτειρέσιν ἀκτίνεσσιν·
 R7 ὡς δὲ τότε' ἐν μήνι γξιν ἐεργμένον ὠγύγιον πῦρ
 R7a = B87 γόμοφοισ' ἀκῆσασα καταστόργοισ' Ἀφροδίτη
 R8 λεπτήσ' εἰν ὀθόνησι ἐχεύατο κύκλοπα Κούρηνη·
 αἰ δ' ὕδατος μὲν βένθος ἀπέστεγον ἀμφιναέντος,
 πῦρ δ' ἔξω διέσκεον, ὅσον ταναώτερον ἦεν.
 R11 ἧ χροάνησι διάντα τετρήατο θεσπεσίησιν·
- As when someone planning a journey prepares a lamp for himself,
 a bright flame of fire burning through the wintry night,
 he fastens linen screens against whatever winds might blow;
 these break the breath of the blowing winds,
 but the light flashes out, as much as is finer,
 and shines across the threshold with unyielding rays;
 R7 “Thus after Aphrodite had fitted the ogygian [primal] fire
 R7a enclosed in membranes with pegs of love,
 R8 she poured round-eyed Kore in filmy veils”;
 these kept out the surrounding depth of water
 but the fire went through to the outside, as much as was finer,
 R11 “where they [the veils] had been bored through with marvelous funnels”.
 (B84 + B87 = G151[F105] = W88 = I103 and 101) [Reconstructed text and translation
 of lines R7, R7a, R8, R11, from Rashed 2007.]

Even here the details are unclear. Are we meant to take the simile of the lantern to be an explanation of how fire enters the eye, even though the eye contains water as well? Does the light leaping from the lantern through the darkness and rain indicate that fire leaves the eye as well as enters it? Much has been written on the fragment, and disagreement will no doubt continue (Rashed 2007; Ierodiakonou 2005; especially O'Brien 1970, who provides a detailed analysis of the passage and of previous interpretations). Here I accept the comprehensive interpretation of Ierodiakonou on both the nature of the pores in the eye and the analysis of color perception (on a continuum between light and dark) in Empedocles. Like O'Brien and Ierodiakonou, I think that the image is just that: a picture that helps us to think about how fire and water can be both contained (without cancelling

each other) and function in the eye as a medium for sight.³⁵ In addition, part of the picture is the selective character of the structure that results: only some of the fire can go through the protecting veils. The simile does not fully explain sight as a sensory process, for it says nothing about what happens once fire has entered the eye, nor does it have anything to say about sight as an aspect of perception and hence as an avenue for knowing.

Finally, I return very briefly to the question of universal thinking in Empedocles. In B110, where Empedocles asserts that all things have intelligence and a share of thought, it is clear that he includes the roots in the “all things”; moreover, he also says that a root can be persuaded to blend with other (unlike) roots by Love and, when incited by Strife will seek its like again in separation. The thinking goes all the way down as it were, and is maintained in any mixture: “So by the will of chance all have understanding/thought (τῆδε μὲν οὖν ἰότητι τύχης πεφρόνηκεν ἅπαντα)” (B103 = G162[F113] = W81 = I95). This means that for Empedocles, as for Xenophanes, Heraclitus, and perhaps Parmenides, there is an omni-awareness in and of the cosmos itself. This sort of pan-psychism in early Greek thought is difficult to understand and accept in a post-Cartesian world; but it suggests that, because the roots themselves are not inert matter in a modern sense (or even matter in an Aristotelian sense), we cannot think of the effluences that enter the body as inert. Thus thinking, awareness, and consciousness cannot be reduced to the presence or absence of matterly effluences. Moreover, better or worse thought cannot be a function of sheer numbers of effluences, but is rather to be attributed to the active cognitive understanding at work on the material provided by sensation and perception. Those activities of close attention and analysis that Empedocles prescribes (B110) cannot be reduced to the receiving of effluences.³⁶

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³⁵ O’Brien 1970, 146: “The true purpose of Empedocles’ image [...] is simply to describe the composition and structure of the eye, with ‘funnels’ that are large enough for fire and too small for water.” Ierodiakonou 2005, 26 f., remarks: “we should not try to press the analogy between the way the lantern is made and works and the way the eye is built and functions in all its details. Rather we should limit ourselves to understanding the simile the way Theophrastus does: namely as an analogy between the function of the membranes which surround the internal fire of the eye and that of the linen screens which surround the lantern”.

³⁶ This paper began as a follow-up to Curd 2013 and 2016. A version was presented at the April, 2015 V Simpósio Internacional dos Estudos Antigos: Temas e Problemas da Filosofia Pré-socrática na Antiguidade at Universidade Federal de Minas Gerais in Brazil. I am grateful to Profa. Miriam Campolina Diniz Peixoto and to the students of the program in ancient philosophy, who organized the conference and were exemplary hosts. I learned a lot from all of the participants during five days of presentations, discussions, and informal conversations. I particularly thank Gábor Betegh, Beatriz Bossi, Gustavo Laet Gomez, Enrique Hülsz, André Laks, and Líliliana Carolina Sánchez Castro for challenging and helpful questions and discussions. Thanks also to the anonymous reader for the volume for helpful comments and suggestions.

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