

Hierocles and the Stoic Theory of Blending

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(This is a final draft; please cite the published version: *Phronesis* 63.1, 87-116, 2018.)

Abstract

In Stoic physics, blending (κρᾶσις) is the relation between active pneuma and passive matter; natural bodies from rocks and logs to plants, animals and the cosmos itself are blends of pneuma and matter. Blending structures the Stoic cosmos. I develop a new interpretation of the Stoic theory of blending, based on passages from Hierocles. The theory of blending, I argue, has been misunderstood. Hierocles allows us to see in detail how the theory is supposed to work and how it fits into Stoic physics.

Keywords

Stoicism, Stoic physics, blending, soul, Chrysippus, Hierocles

1. Introduction

According to Stoic physics, natural bodies are blends of pneuma and matter.¹ By acting on matter, pneuma gives rise to such bodies and sustains their existence. Different forms of pneuma belong to different kinds of natural bodies: ἔξις belongs to inanimate natural bodies such as rocks and logs; φύσις belongs to living plants; ψυχὴ belongs to animals.² The theory of blending is supposed to explain how pneuma and matter are related. However, ancient and modern commentators alike have dismissed this vital piece of Stoic physics as counterintuitive and philosophically unsound.³

¹ The matter with which pneuma blends, is not prime matter, one of the two Stoic ἀρχαί (DL 7.134 = LS 44B), but higher-level matter, characterized by water and earth, the two passive elements (Nemesius, *Nat. hom.* 5, 52.18-19 Morani = LS 47D = SVF 2.418; Galen, *Plen.* vii. 525.9-14 Kühn = LS 47F = SVF 2.439; Plutarch, *Comm. not.* 1085C-D = LS 47G = SVF 2.444, part; DL 7.150 = SVF 2.316). See also Long 1982, 39-40 and Gourinat 2009, 48, 58.

² See SVF 2.439-462; LS 47N, O, P, Q, R.

³ Among the ancients, Alexander of Aphrodisias and Plutarch are particularly vehement; for modern criticisms, see e.g. Long 1974, 158-60, Todd 1976, 46, Sedley 1999, 390-1, Nolan 2006, 175-6; cf. Gould 1970, 112.

In this paper, I argue that the theory of blending has been misunderstood. A careful reading of the sources shows that the standard interpretation is unmotivated, and that a piece of the puzzle is missing. The later Stoic Hierocles (2nd century CE), I argue, provides the missing piece. By studying Hierocles, we can see in detail how the theory of blending is supposed to work and how it fits into Stoic physics.

Our best source for the Stoic theory of blending is Alexander of Aphrodisias' treatise *De mixtione*.⁴ Alexander is no doxographer, and his text cannot be treated straightforwardly as a report. Nevertheless, provided we proceed with care, *De mix.* offers an unparalleled level of detail. I will refer to some of our other sources intermittently throughout, but mostly as supplements to *De mix.* On the points of interest for us, there are no substantive conflicts among the sources. Following Alexander, I am going to treat Chrysippus as the author of the orthodox Stoic position.

According to Alexander, Chrysippus says that blends are a certain kind of mutual coextension (ἀντιπαρέκτασις) of bodies whole through whole (*De mix.* 216.28-217.2). Such coextensions have several interesting features: the volume of a blend can be equal to or less than the volume of only one of the ingredients (219.9-22); bodies of vastly unequal volume can blend whole through whole – a drop of wine, for instance, could blend with the ocean, as Plutarch reports (*Comm. not.* 1078E = LS 48B = *SVF* 2.480 part; cf. *De mix.* 217.31-2). And notoriously, blending is said to involve collocation of bodies.⁵ However, two facts distinguish blends in particular: on the one hand, that the ingredients are preserved and can be separated out again (*De mix.* 216.28-217.2), and on the other hand, that the parts of the blending bodies participate (μετέχειν) in all the ingredients (217.9-12). 'Participation' is typically interpreted mereologically in this context, such that objects participate by being composed of certain kinds of parts. As a result, interpreters say that every part of a Stoic blend is composed of all the ingredients in the blend: a blend of water and wine is water and wine all the way down, a blend of soul and body is soul and body all the way down, etc. I argue in contrast that by Chrysippus' lights this is inconsistent with the preservation of the ingredients in the blend.

⁴ I am using Groisard's improved text of *De mixtione* (2013). References are to the standard page numbers of the CAG edition by Bruns. Unless otherwise noted, all translations are my own.

⁵ See e.g. *De mix.* 218.15-24, 219.9-12; *SVF* 2.465, 467-9. There is some disagreement among modern interpreters. Gould (1970, 109), Long (1974, 158), Sandbach (1975, 76), Nolan (2006, 174-5) and Betegh (2016, 402) all think blending involves collocation. Lewis (1988) disagrees; Sorabji adopts a mixed view (1988, 85-105).

Furthermore, Alexander's polemic against Chrysippus indicates that participation should be understood non-mereologically.

Hierocles offers an alternative. According to Hierocles, blending involves juxtaposition whole through whole (παράθεσις δι' ὅλων), such that the parts of each ingredient are juxtaposed with parts of the others. Participation occurs not by composition but by the ingredients continuously exchanging motion. The parts of the blending bodies participate in all the ingredients because their motion is determined jointly by all the ingredients.⁶ This picture renders the participation and preservation conditions consistent. Moreover, it presents the Stoic theory of blending as an internally coherent, distinctive alternative to Aristotelian and atomist theories of material composition.

The Hieroclean account, I will argue, is compatible with what we know of Chrysippus' view, appearances to the contrary. But the sources do not allow us to decide whether Hierocles has refined and developed Chrysippus' theory or rather simply holds it, his text providing details about how the theory operates that we happen to lack for Chrysippus himself.

In Section 2 below, I present Chrysippus' theory of blending. I show how the participation and preservation conditions come into conflict, given a certain, mereological understanding of participation, and I motivate a non-mereological interpretation with evidence from Alexander. In Section 3, I turn to Hierocles, and develop an interpretation of blending on which participation and preservation both are satisfied. In Section 4, I consider several questions and objections, some concerning the Stoic provenance of the Hieroclean account, some concerning the broader issues of collocation of bodies, infinite division, and limits.

2. Chrysippus' Theory of Blending

Alexander tells us that blending (κρᾶσις) is one of three species of mixture according to Chrysippus.⁷ The other two are juxtaposition (παράθεσις) and fusion (σύγχυσις). Juxtapositions are mixtures in which the ingredients retain their own character, since they are only joined at

⁶ The key passages are *Elements of Ethics* IV.3-10 and IV.38-53.

⁷ According to Stobaeus (*SVF* 2.471) and Philo (*SVF* 2.472), μίξις is not the genus of κρᾶσις; instead they are on par, but μίξις is of dry bodies, while κρᾶσις is of liquids. This need not perturb us; the relevant details are the same in both cases. Moreover, there is frequent terminological slippage between κρᾶσις and μίξις (compare e.g. Aristotle, *GC* 1.10 and *Topics* 122b26-31); and it is possible that Chrysippus used μίξις both for the genus and for a species.

the surface and ‘by juncture’ (καθ’ ἀρμῆν). An example is a mixture of wheat-grains and beans, where individual beans and grains remain separate and qualitatively unchanged. Fusions, by contrast, are mixtures in which the ingredients are destroyed, so that a new sort of body results; certain medicines are supposed to be examples of this.⁸ Blends differ from both (*De mix.* 216.28-217.2):

T1 For he [Chrysippus] says that mutual coextension whole through whole of two or more bodies through one another, such that each of them preserves in such a mixture its own substance and the qualities in it, alone among mixtures is a blend; for it is a peculiar mark of bodies that have been blended to be able to separate again from one another, which only happens by the blended [bodies] preserving their own natures in the mixture.⁹

Blending is a certain kind of ‘mutual coextension whole through whole of two or more bodies through one another’, the kind in which the bodies are preserved in such a way that they can be separated again. Preservation, Chrysippus thinks, is a precondition for separation, which he takes to be a peculiar mark of blends (ἴδιον).¹⁰ By virtue of mutual coextension whole through whole, on the one hand, and preservation on the other, blends occupy a middle position between juxtaposition and fusion; mutual coextension sets them apart from juxtapositions, preservation from fusions.

Whether there is for Chrysippus a middle position to be occupied between juxtaposition and fusion is a dialectical crux in *De mix.* Alexander argues that Chrysippus’ blends are going to collapse into either juxtapositions or fusions, because the ingredients cannot be preserved unless they are juxtaposed and not properly blended, and the ingredients cannot be properly blended unless they are destroyed and fused (220.37-221.11; I return to this argument below).¹¹ Alexander himself avoids this problem by appealing to potential being.

⁸ See *De mix.* 216.17-25.

⁹ τὴν γὰρ δύο ἢ καὶ πλείονων τινῶν σωμάτων ὄλων δι’ ὄλων ἀντιπαρέκτασιν ἀλλήλοις οὕτως ὡς σώζειν ἕκαστον αὐτῶν ἐν τῇ μίξει τῇ τοιαύτῃ τὴν τε οἰκείαν οὐσίαν καὶ τὰς ἐν αὐτῇ ποιότητος λέγει κρᾶσιν εἶναι μόνην τῶν μίξεων· εἶναι γὰρ ἴδιον τῶν κεκραμένων τὸ δύνασθαι χωρίζεσθαι πάλιν ἀπ’ ἀλλήλων, ὃ μόνον γίνεται τῷ σώζειν ἐν τῇ μίξει τὰ κεκραμένα τὰς αὐτῶν φύσεις.

¹⁰ That the ingredients of a blend can be separated out again is a view Aristotle shares: *GC* 1.10, 327b27-9.

¹¹ Alexander’s objection echoes the argument presented by Aristotle in *GC* 1.10, 327a34-b6.

Following Aristotle, he holds that the ingredients are preserved in potentiality, while the blending process destroys them in actuality (*GC* 1.10, 327b22-31). For Alexander, this means that the token ingredients that go into the blend are destroyed, but the blend preserves in potentiality something of the same type, which can be separated out from it (*De mix.* 231.22-7; 231.30-232.6). Evidently, Chrysippus did not appeal to potential being. He thought that the same token ingredients that go into the blend persist throughout the blend's existence; that is why they can be separated out from the blend.¹² The challenge for Chrysippus is to explain how the same token ingredients can be preserved even as they blend.¹³

According to Alexander's report, the blending bodies must preserve their 'own substance and the qualities in it'. Alexander does not say which qualities must be preserved, but based on his reference to 'nature' in T1 and evidence from Stobaeus (*SVF* 2.471), we can infer that the qualities in question are the characteristic ones necessary for the body to be what it is.¹⁴ For Chrysippus, 'substance' (οὐσία) refers to matter, primarily the unqualified passive principle, but also the qualified matter of particular bodies.¹⁵ In this context, 'substance' refers to the matter of the blending bodies.¹⁶ The requirement that the blending bodies preserve their matter is plausibly connected to Chrysippus' view that no two peculiarly

¹² See e.g. *De mix.* 220.26-221.11, 231.22-7, 231.30-232.6. Since only bodies can act or be acted on according to Stoic corporealism, the ingredients must persist as bodies in the blend to be able to be separated from one another; they must *be there* to be separated. Chrysippus' argument for the corporeality of the soul based on its separation from the body is particularly apposite here: Nemesius, *Nat. Hom.* 2, 22.3-6 = LS 45D = *SVF* 2.790, part; see also Cicero, *Acad.* 1.39 = LS 45A = *SVF* 1.90; Nemesius, *Nat. Hom.* 2, 21.6-9 = LS 45C = *SVF* 1.518, part; Stobaeus, *Ecl.* 1, i. 138.14-139.4 Wachsmuth = LS 55A = *SVF* 1.89, 2.336; Sextus Empiricus, *M.* 9.211 = LS 55B = *SVF* 2.341. For the same reason, the continuous interaction of pneuma and matter when they blend entails that they exist as bodies: see e.g. *De mix.* 216.14-17, 223.6-9, 224.32-225.3; Hierocles, *Elements of Ethics* IV.3-10, IV.38-53; Nemesius, *Nat. Hom.* 2, 18.2-10 = LS 47J; Origen, *Princ.* 3.1.2-3 = LS 53A = *SVF* 2.988, part; Galen, *Syn. puls.* ix. 458.8-14 Kühn = LS 55H = *SVF* 2.356 (cf. LS 55F); Sextus Empiricus, *M.* 7.234 = LS 53F. Thanks to an anonymous referee for urging me to make this explicit.

¹³ Based on DL 7.151 (= LS 48A = *SVF* 2.479), some interpreters have said the ingredients of blends are destroyed (Lewis 1995, 97; 1988; Sellars 2006, 89) – contradicting Alexander. I am not convinced this is the right interpretation of DL but, however one deals with his report, as an interpretation of the Stoic theory of blending it is not feasible.

¹⁴ Long and Sedley adopt a similar interpretation: 1987, i. 292-3.

¹⁵ See Simplicius, *In Cat.* 48.11-16 Kalbfleisch = LS 28E (cf. *SVF* 2.374); DL 7.150 = *SVF* 2.316; Simplicius *In Cat.* 217.32-218.1 = LS 28L = *SVF* 2.389; Plutarch, *Comm. not.* 1083A-1084A = LS 28A; DL 7.134 = LS 44B; Galen, *Plen.* vii. 525.9-14 = LS 47F = *SVF* 2.439; LS 28C.

¹⁶ The alternative is that 'substance' (οὐσία) in T1 means 'essence'. This interpretation is unlikely, since Alexander elsewhere refers to Chrysippus' requirement as preservation 'in regard to the substrate' (κατὰ τὸ ὑποκείμενον) (220.29-34), which better fits the sense of οὐσία as the matter of particular bodies. This is not to say that Chrysippus referred to the requirement thus, only that Alexander reasonably does so on the suggested interpretation.

qualified particulars, such as Socrates or Dion, can have the same matter (Plutarch, *Comm. not.* 1077C-E = LS 280; Philo *Aet. mundi* 48 = LS 28P = *SVF* 2.397). Since the particular bodies that go into a blend persist throughout its existence, they must retain their own separate matter on pain of violating this constraint. For Alexander, by contrast, there is no such worry, because the particulars that go into the blend do not persist. Indeed, he is clear that the matter of the ingredients is destroyed and subsumed into the matter of the blend (*De mix.* 231.1-4, 12-19, 22-7).

Preservation distinguishes blending from fusion. What distinguishes blending from juxtaposition is ‘mutual coextension whole through whole’.¹⁷ Our sources are generally silent as to Chrysippus’ meaning, but Alexander provides one crucial piece of evidence (*De mix.* 217.9-12):

T2 And he [Chrysippus] supposes that such a coextension of [bodies] blending occurs when the blending bodies pass through one another so that no part in them is not participating in all the [ingredients] in such a blended mixture.¹⁸

Here ἀντιπαρέκτασις is described in terms of a relation between the parts of the blending bodies and all the ingredients.¹⁹ When bodies are blended in the relevant way, their parts all ‘participate’ (μετέχειν) in all the ingredients in such a blend.²⁰ So, for example, in a blend of body and soul (an animal), each part of soul and each part of body will participate in body and soul. Bodies according to Chrysippus are continuous, and the parts (μόρια) at issue here are any and all parts, however small, which could be obtained by division of such bodies (I return to this in Section 4).²¹

¹⁷ The term ἀντιπαρέκτασις is extremely rare, and seems to be a Stoic coinage.

¹⁸ τὴν δὲ τοιαύτην ἀντιπαρέκτασιν τῶν κίρναμένων ὑπολαμβάνει γίνεσθαι χωρούντων δι’ ἀλλήλων τῶν κίρναμένων σωμάτων, ὡς μηδὲν μόριον ἐν αὐτοῖς εἶναι μὴ μετέχον πάντων τῶν ἐν τῷ τοιοῦτῳ κεκραμένῳ μίγματι.

¹⁹ Throughout, ‘part’ should be understood as ‘proper part’ (cf. Barnes 2011, 439).

²⁰ An alternative interpretation would be that μηδὲν μόριον ἐν αὐτοῖς only refers to the parts of the ingredients insofar as they are blended. On this interpretation, it is left open whether the ingredients also have parts that do not participate in all the ingredients. According to Alexander, that would be a juxtaposition, not a blend. It is clear from Alexander’s presentation that the Stoics want to avoid this (e.g. *De mix.* 220.37-221.11, 221.25-222.14). Moreover, Alexander distinguishes the Stoic position from that of Anaxagoras and Archelaus, because the latter make blends into juxtapositions of this sort, whereas the former do not (213.15-214.10).

²¹ See Stobaeus, *Ecl.* 1, i. 142.2-6 = LS 50A = *SVF* 2.482, part; DL 7.150-1=LS 50B = *SVF* 2.482, part; Plutarch, *Comm. not.* 1078E-1080E = LS 50C.

The key question is what T2 means by ‘participate’ (μετέχειν). One answer is mereological. We might suppose that participating is a matter of the participating subject’s having parts of a certain sort, so that it literally partakes of whatever it participates in. Thus, x would participate in, say, soul or body, because it has soul parts or body parts as its own parts, or equivalently, because it is composed (at least in part) of such parts.²² This seems to be the interpretation taken for granted by most interpreters. Long and Sedley (1987, i. 293) and Nolan (2006, 170-2, 176) do so fairly clearly; others are harder to pin down, but may reasonably be taken to assume such an interpretation.²³ It is not unfair to call this mereological interpretation the standard interpretation.

On the mereological interpretation of μετέχειν, T2 says that the parts of the blending bodies are composed of parts of such a sort as compose the ingredients of the blend. However, it is difficult to see how T2 thus interpreted is compatible with the preservation of the ingredients.²⁴ Consider soul: when soul blends with body, a pervasive material change occurs – every part of soul comes to have body parts as parts. It is unclear, then, how it could still be that the substance of soul and the qualities in it are yet preserved. For, according to Stoic physics, soul is pneuma and pneuma is composed of fire and air (Galen, *PHP* 5.3.8 = LS 47H; *De mix.* 224.14-19; 224.32-225.8). By being so composed, it exhibits its characteristic features and powers: it is light, elastic, malleable, rare, and it qualifies and sustains other bodies by virtue of its so-called tensile motion, a simultaneous inward and outward motion, which in turn is explained by reference to air contracting and fire expanding (on which more below).²⁵ By contrast, earth and water, the elements which primarily compose the body, are

²² Our sources indicate that the Stoics took the language of participation over from Plato and adapted it to their own views. Thus, particulars do not participate in forms (there are no such things), but rather in general types, and participating does not explain why the particulars are what they are (contrast e.g. *Phaedo* 100d6); instead, facts about the particulars explain why they participate. It is controversial what general types are for the Stoics, what ontological status they have, and to whom the views found in our sources belong. See Caston 1999 and Bailey 2014, 285-305 for discussion. I will leave these questions aside. For our purpose, what is important is that particulars participate in some kind of general type. It is possible that the Stoics used participation language differently than this, but the available evidence suggests that what is participated in is general (*SVF* 1.65 = LS 30A; *SVF* 2.714; 3.76, 114, 141). I am interested in what makes it true to say that x participates in soul, for example. That x has parts of the soul type is a candidate answer to this question.

²³ E.g. Sambursky 1959, 12-13, 14-15; Long 1982, 39; White 2003, 147-8; Sellars 2006, 89.

²⁴ Among modern interpreters, Nolan 2006, 170, 176 recognizes that T2 poses a problem.

²⁵ *De mix.* 218.3-4, 223.36-224.3, 224.23-5; Nemesius, *Nat. hom.* 2, 18.2-10 = LS 47J; Plutarch *Stoic. rep.* 1053F-1054B = LS 47M = *SVF* 2.449; Plutarch, *Comm. not.* 1085C-D = LS 47G = *SVF* 2.444, part; Galen, *Nat. fac.* 106.13-17 Helmreich = LS 47E = *SVF* 2.406; Galen, *PHP* 5.3.8 = LS 47H = *SVF* 2.841, part; cf. Simplicius, *In Cat.* 237.25-238.20 = LS 47S = *SVF* 2.393, part.

largely inert and passive.²⁶ Because of the connection between the characteristic qualities of soul and body and their elemental composition, if each part of soul is composed of soul and body, neither the substance of soul nor the qualities in it will be preserved. The substance will not be preserved because the change of elemental composition is a pervasive change of matter, and the qualities will not be preserved because they depend on a certain elemental composition of fire and air.

This result, we should note, would undermine the explanatory role soul and body are meant to play. If soul and body are both composed of soul and body through and through, we cannot explain the features of the animal they form by appeal to their distinctive contributions and interactions as identifiably different sorts of things in the blend. Soul and body are meant to contribute not just to an explanation of how a blend comes to be, but also to an explanation of its continued existence as the sort of thing it is. They do this by interacting in the blend, in a way determined by their characteristic qualities and elemental composition.²⁷ If soul and body (and pneuma and matter in general) do not preserve their substance and (characteristic) qualities when blended, they will not be able to fulfill this explanatory role. To do that, they must be preserved as distinct bodies able to act and be acted on in their characteristic way.

In the literature, it is commonly said that every part of a Stoic blend is composed of all the ingredients of the blend; in that sense, Stoic blends are thought to be homoiomeres.²⁸ Long and Sedley for example say: 'Such coextension means that all the constituents of the blend are completely present in any part of it, no matter how small, a position which suits the Stoics' defense of the infinite divisibility of body' (Long and Sedley 1987, i. 293). Similar views are taken by Sambursky (1959, 12-13, 14-15), Sandbach (1975, 76), Sellars (2006, 89), and White (2003, 147-8). Although these authors all put the point in somewhat different terms, interpretations of the homoiomerous sort lie at the heart of the currently prevalent understanding of the Stoic theory of blending. T2 is the best evidence we have for the claim that Chrysippean blends are homoiomeres.

²⁶ Nemesius, *Nat. Hom.* 5, 52.18-19 = LS 47D = SVF 2.418; Galen, *Plen.* vii. 525.9-14 = LS 47F = SVF 2.439; Plutarch, *Comm. not.* 1085C-D = LS 47G = SVF 2.444, part; *De mix.* 218.2-6. See also Long 1982, 39-40.

²⁷ See note 12 above for references.

²⁸ To say that x is a homoiomere may involve two claims: (a) that every part of x is composed of the same sorts of parts, and (b) that every part of x is composed of sorts of parts in the same ratio. So, if x is an animal composed of soul and body, then (a) every part of x is composed of soul parts and body parts, and (b) the same ratio of soul to body holds throughout x. In describing Stoic blends, commentators often only make claim (a). It is unclear whether these commentators also think (b) holds. In this paper, I will use 'homoiomere' to mean (a) only.

These interpretations are apt to mislead. T2 does not concern the blend and its parts: T2 says that *the parts of the ingredients* participate in all the ingredients.²⁹ This does not mean that blends are not homoiomeres. On the mereological interpretation of ‘participation’, that in fact follows. For on the mereological interpretation, T2 says that the ingredients are homoiomeres, and if the ingredients are homoiomeres, the resultant blend must be too. Yet, this is clearly not Chrysippus’ main concern. Further, focusing on the blend rather than the ingredients helps obscure the problem caused by the mereological interpretation. We are better served considering T2 directly, focusing as it does on the ingredients, their parts, and the participation relation.

Independently of T2, there is reason to reject the claim that Stoic blends are homoiomeres. As argued above, the mereological interpretation renders T2 inconsistent with preservation. However, we can generate the same problem starting from the claim that the blend is a homoiomere. Consider two ingredients, A and B, which blend to form C. Since C is a homoiomere, every part of C will be composed of A and B. If A and B are soul and body, then every part of the animal they form, however small, will be composed of soul and body. But what about A and B themselves? Are they parts of the blend, C? Surely they are. We have explicit evidence that body and soul are parts of the animal (a blend).³⁰ It is safe to generalize and say that the ingredients of a blend are parts of the blend. But if A and B are parts of the blend, C, we can infer by the transitivity of parthood that *the parts* of A and B are parts of C as well.³¹ Just like A and B, then, and any other parts of C, they too must be composed of A and B. Hence, every part of A and B, no matter how small, will be composed of A and B. And again, this is inconsistent with the preservation of A and B.

Let us return to T2. On the standard, mereological interpretation, it turns out that T2 comes into conflict with the requirement of preservation: T2 says that every part of each ingredient must be composed of parts such as compose all the ingredients; but then neither the matter nor the characteristic qualities of the ingredients are preserved. It is of course possible that Chrysippus’ theory was incoherent. Alexander, Plutarch and others certainly think

²⁹ In μηδὲν μόριον ἐν αὐτοῖς εἶναι μὴ μετέχον πάντων τῶν ἐν τῷ τοιούτῳ κεκραμένῳ μίγματι, ἐν αὐτοῖς refers back to τῶν κίρναμένων σωμάτων, which refers to the ingredients. Long and Sedley appear to recognize this in their translation of T2, even as they interpret it as a claim about the parts of the blend: LS 48C7 (Long and Sedley 1987, i. 293); similarly, White 2003, 147-8.

³⁰ See e.g. Stobaeus, *Ecl.* 1, i. 177.21-179.17, reporting Posidonius (= LS 28D), Seneca, *Ep.* 113.4-5, Hierocles *Elements of Ethics* IV.38-40; cf. Menn 1999, 222 n. 10.

³¹ Even if one can question whether transitivity should be generalized to all cases, it should be uncontroversial that it obtains in the present case. See Barnes 2011, 440-3 for discussion of the sources.

so, and perhaps they are right. However, on the mereological interpretation, Chrysippus' requirement of participation is straightforwardly incompatible with preservation. This is no philosophically interesting problem, nor is it subtle; this is a blunder, of which we should not convict Chrysippus unless we have no other option.

I want to mention two ways to avoid the problem that I think should be rejected. First, we could dismiss Alexander's report in T2 as confused. This is a counsel of desperation. T2 is not the only passage where we find the participation requirement, which signals that it was part of the Stoic theory (*De mix.* 217.36; *Elements of Ethics* 4.5-8). Alternatively, we can say that only a subset of the parts of the blend abides by the participation requirement – the continuous parts for instance, as Nolan suggests (2006, 176); the ingredients and their parts remain preserved. And this is what Alexander expresses in T2. There are two problems with this suggestion. First, and most tellingly, there is no reference to the parts of the blend in T2; the reference is to the parts of the ingredients. Secondly, there is no evidence in *De mix.* of a distinction between kinds of parts. Since Chrysippus is committed to blending whole through whole, T2 should be understood as referring to every part of the ingredients, no matter how minute, which could be obtained by division of a continuous body. The right way to approach the problem, I contend, is to look for another interpretation of μετέχειν, one compatible with the preservation requirement. In the next section, I will argue that Hierocles provides just that.

Before turning to Hierocles, however, it will be useful to consider another passage from *De mix.* One of Alexander's main objections to Chrysippus in *De mix.* is that blends will collapse into juxtapositions or fusions, because the ingredients cannot be both preserved and blended whole through whole. His argument suggests that Chrysippus does not think blends are homoiomeres and that a non-standard understanding of μετέχειν is just what his theory needs (*De mix.* 220.37-221.11):

T3 For if the blended bodies have been mixed whole through whole and neither of them has a part in the blend unmixed with the other, it is impossible that either of them is surrounded by its particular surface; for every part of them that is surrounded by its own surface will be unmixed with the other (for the surface of wine cannot be the surface of water, or that of water the surface of wine), so that blending will in this way not be mixing whole through whole, but they would be saying that blending is a juxtaposition of parts with parts, in seeking to avoid which they say that mixing is one thing and blending another. But if there should be no part of the mixed [bodies] with its own

circumscription and surface, but instead the resultant body is a homoiomere, it would no longer be a juxtaposition, but a blending whole through whole; but the original bodies of the mixed ingredients would no longer be preserved, instead they would have been fused and destroyed.³²

It is clear from the context (220.29-37) that Alexander's strategy is to show that satisfying preservation entails that the ingredients are not blended whole through whole, and that being blended whole through whole entails failure of preservation. He does this here by arguing first that, if the ingredients are blended whole through whole and no part of either is unmixed with the other, then the ingredients are not surrounded by their own particular surfaces, since every part of the one that is mixed with the other will no longer be surrounded by its own surface. In this case, *the blend* is a homoiomere, but the ingredients are no longer preserved and by Chrysippus' lights the result is not a blend, but a fusion. Secondly, if by contrast the parts of the ingredients are surrounded by their own surfaces, then the result is a juxtaposition, not a blend whole through whole.

If it is a genuine part of Chrysippus' theory that the ingredients and their parts must be surrounded by their own surfaces, T3 suggests that Chrysippean blends are not homoiomeres. Alexander's argument implies that preservation is not consistent with being a homoiomere and that Chrysippus sought to maintain a claim that entails that the blend is not a homoiomere (that the ingredients and their parts are surrounded by their own surfaces). As we have seen, it would make sense for Chrysippus to deny that blends are homoiomeres. And similarly, it would make sense for Alexander to try to foist this claim upon Chrysippus, on the shared understanding that the ingredients in a homoiomerous blend are not preserved, because they do not survive the change of elemental composition. A passage in Plutarch supports this interpretation. Plutarch reports that contact (ἀφή) for the Stoics occurs 'at the limit' (κατὰ πέρας), rather than whole to whole or part to part (*Comm. not.* 1080E = *SVF* 2.487). Since surfaces are the limits of bodies (DL 7.135), Alexander could be taken to imply, then, that in

³² Εἰ μὲν γὰρ ὅλα δι' ὄλων τὰ κεκραμένα μέμικται καὶ μὴ ἕτερον αὐτῶν ἐν τῷ μίγματι ἄμικτον θατέρου μόριον ἔχει, ἀδύνατον αὐτῶν ἐκάτερον ὑπὸ ἰδίας ἐπιφανείας περιέχεσθαι· πᾶν γὰρ μόριον αὐτῶν τὸ ὑπὸ οἰκείας ἐπιφανείας περιεχόμενον ἄμικτον ἔσται θατέρου (οὐ γὰρ οἶόν τε τὴν τοῦ οἴνου ἐπιφάνειαν ὕδατος εἶναι, ἢ τὴν τοῦ ὕδατος οἴνου), ὥσθ' οὕτως οὐκ ἔσται δι' ὄλων μίξις ἢ κρᾶσις, ἀλλ' εἶεν ἂν παράθεσιν τὴν κρᾶσιν μορίων μορίοις λέγοντες, ὃ φυλασσόμενοι ἄλλο φασὶ μίξιν καὶ ἄλλο κρᾶσιν εἶναι. Εἰ δὲ μηδὲν μόριον κατ' οἰκείαν περιγραφὴν τε καὶ ἐπιφάνειαν εἶη τῶν μεμιγμένων, ἀλλ' εἶη πᾶν ὁμοιομερὲς γεγονός τὸ σῶμα, οὐκέτι μὲν ἂν εἶη παράθεσις, ἀλλὰ δι' ὄλων κρᾶσις· οὐ μὴν ἔτι σώζοιτο ἂν τὰ ἐξ ἀρχῆς σώματα τῶν μεμιγμένων, ἀλλ' εἶη ἂν συγκεχυμένα τε καὶ συνεφθαρμένα.

Chrysippean blends the ingredients and their parts are only ever in surface contact, that is, they are in contact with one another *by means of their own surfaces*, and that this is how they interact.³³

This would explain why Alexander thinks Chrysippean blends turn out to be juxtapositions. If the ingredients and their parts retain their own surfaces and merely interact by contact, it would be unclear for Alexander, who thinks blends are homoiomeres, how a Chrysippean blend could be different from a juxtaposition καθ' ἀρμὴν of wheat-grains and beans. On this interpretation, the challenge for Chrysippus is to explain how the ingredients in a blend are blended whole through whole, even though they retain their own surfaces and interact by surface contact, which amounts to providing a non-mereological account of participation in T2.

Nowhere does Alexander or any other source say what Chrysippus means by μετέχειν. This could be for a number of reasons. Chrysippus might not himself have explained it; Alexander might not be aware of the explanation; Alexander might have been aware of it, but excluded it for his own purposes. Yet the incoherence that results from the mereological interpretation as well as the dialectic between Alexander and Chrysippus indicate that we should look for an alternative Stoic meaning of μετέχειν.

3. Hierocles' Theory of Blending

Hierocles understands blending very differently from the standard interpretations of Chrysippus, and in a way, as I will argue, which can sustain both participation and preservation. Hierocles' importance for Stoic ethics has been widely recognized; his importance for the theory of blending, by contrast, has not. The passages of interest for us occur in *Elements of Ethics* cols. III.56-IV.53, where Hierocles argues that animals perceive themselves continuously from birth. The argument employs four main premises: first, that soul and body are bodies, and as such are tangible and resistant to blows; secondly, that soul is blended with the body; thirdly, that the soul is a perceptive faculty, and fourthly that soul exhibits a certain kind of motion, the so-called tensile motion, characteristic of Stoic pneuma (this section is unfortunately lacunose).³⁴ We will focus on IV.3-10, in which Hierocles discusses blending, and IV.38-53, where he connects blending and tensile motion. Hierocles is concerned with blending and tensile motion only insofar as it pertains to self-perception, yet it is clear that his remarks

³³ For discussion of the issues brought up in DL 7.135 and *Comm. not.* 1080E, see Robertson 2004.

³⁴ For discussion and reconstruction of the argument see Inwood 1984.

are general even if not complete (IV.3-23, IV.27-31). So even though he only discusses the case of soul and body, his account is not specific to this case.³⁵ This is *Elements of Ethics* IV.3-10:

T4 And secondly, in addition to this we must understand that not as in a vessel is the soul encompassed by the body, in the manner of liquids held in jars, but they have been mingled together marvelously and blended together whole through whole, (i) so that not even the least part of the blend is without participation in either of them; (ii) for blending is most similar to what happens in the case of the red-hot iron; for there the same as here the juxtaposition is whole through whole.³⁶

Hierocles contrasts the blending of soul and body with liquid contained in jars, and specifies the difference in what I have marked as (i) with a description reminiscent of T2: ‘so that not even the least part of the blend is without participation in either of them.’ What I have translated ‘participation’, μετοχή, is the noun formed from μετέχειν, the verb used in T2. Contrary to T2, though, Hierocles refers to a ‘least part’ of the blend (τούλάχιστον μέρος). Chrysippus denied that bodies have any smallest parts (e.g. *Comm. not.* 1078E-1080E = LS 50C), and it seems to me unlikely that Hierocles is rejecting the orthodox Stoic position on the composition of bodies. The example of the red-hot iron, invoked by Hierocles, was apparently a standard example used by Chrysippus or his followers (*De mix.* 218.1-2; *SVF* 2.471). Further, there is no sign elsewhere in Hierocles’ exposition that he takes himself to be departing from orthodoxy. So it is more plausible that τούλάχιστον μέρος refers to a part of unspecifically small size. Thus, similarly to Chrysippus in T2, Hierocles is saying that any and all parts which could be obtained by division of continuous bodies participate in the ingredients of a blend. Another difference is that Hierocles refers to the parts of the blend (μίγμα), not the parts of the ingredients, as T2. This difference is not substantive. Hierocles’ account is concerned with the interaction of the ingredients, as we would expect and as we will see in greater detail shortly. (i) is framed in terms of the parts of the blend because the interaction of the

³⁵ The Hieroclean account certainly applies to pneuma and matter in general. How it might be applied beyond that will not be discussed here.

³⁶ δ(ε)ύτερον δ(ε) ἐ(πι) τῷδε πρ(ο)σενθυμητέον ὡς οὐχί [κ]αθάπερ ἐν ἀγγείῳ τῷ σώματι π(ε)ριεῖργετ(αι) ἢ ψυχὴ κ(α)τὰ τὰ π(ε)ρισχόμε(εν)α ταῖς πιθάκναις ὑγρά, συμ(π)εφύρατ(αι) δ(ε) δ(αι)μονίως κ(α)ὶ σ(υ)γκέκρατ(αι) κ[(α)τὰ] πᾶν, (i) ὡς μηδ(ε) τούλάχιστον τοῦ μίγματο(ς) μέρος τ(ῆ)ς ὀποτέρου αὐτ(ῶν) ἀμοιρεῖν μετοχ(ῆ)ς· (ii) πρ(ο)σφερεστέρα γ(ὰρ) ἢ κράσις τοῖς ἐ(πι) τοῦ δ(ια)πύρου σιδήρου γινομ(έν)οις· [ἐ]κεῖ τε γ(ὰρ) ὁμοίως κἀνταῦθα δι’ ὄλ(ων) (ἐστίν) ἢ π(α)ράθεις.

ingredients and their parts entails the participation of the parts of the blend (I return to this below).

However, Hierocles' next claim, (ii), certainly does seem substantively different from Chrysippean orthodoxy, at least as standardly interpreted: 'for blending is most similar to what happens in the case of the red-hot iron; for there the same as here the juxtaposition is whole through whole.' Chrysippus, as mentioned, says that juxtaposition occurs by juncture (καθ' ἀρμήν) and is a distinct kind of mixture, exemplified in mixtures of grains and beans. Yet Hierocles invokes an example used by Chrysippus to illustrate blending, the red-hot iron, to illustrate what he calls 'juxtaposition whole through whole' (παράθεσις δι' ὅλων). What does this mean?

The uses of the explanatory particle (γάρ) indicate that (ii) is meant to elucidate the blending of soul and body. Hierocles is careful to specify, using the perfect in IV.6 (συμπεφύραται and συγκέκραται), that he is thinking of the process of blending as completed. So juxtaposition δι' ὅλων is a state of the blended ingredients, not just a feature of the process. Now, following our interpretation of the parts at issue in (i), δι' ὅλων should be understood in terms of unspecifically small parts; juxtaposition δι' ὅλων, then, turns out to be juxtaposition of each and every part, however minute. So, when soul is blended with body, every part of soul is juxtaposed with parts of body and every part of body with parts of soul. Since such juxtaposition requires division, the process of blending will correspondingly involve them dividing one another everywhere, to echo Alexander (*De mix.* 222.14-18; cf. 219.32-220.3). Soul and body are threaded through one another, as it were, all the way down.

This is not a complete explanation of soul and body blending; notably, it does not explain why each part of the blend *participates* in soul and body. However, it does explain how soul and body can interact with one another leaving out no part of either. Since every part of body is juxtaposed with parts of soul and vice versa, there is no part of either that is not in contact with the other, and so soul can affect body everywhere and likewise body soul. This is the claim that Hierocles needs for his argument, as we will see. Thus, it is not surprising that he does not offer a comprehensive account of blending in this context.

Hierocles' account of the mereological structure of blends is strikingly similar to one considered and dismissed by Aristotle, *GC* 1.10, 327b33-328a17:

T5 For when the mixing [bodies] have been divided into small parts in such a way and placed next to one another in such a manner that each is not apparent to perception,

have they then been mixed? Or not, but instead when it is in such a way that any part whatever of the mixed [bodies] is next to another? So, on the one hand, it is said in the latter sense, for instance that barley grains have been mixed with wheat grains, when each barley grain is placed next to some wheat grain. But if every body is divisible, given that body mixed with body is a homoiomere, every part would have to end up next to another. But since it is not possible to be divided into the least parts, and composition and mixing are not the same but different, it is clear that we must say that the mixing [bodies] have not been mixed when they are preserved in small parts (for composition will not be mixing nor blending, nor will the part have the same account as the whole. And we say that, if they indeed have been mixed, the mixture must be a homoiomere, and as the part of water is water, so also the part of the blend. And if mixing is a composition in respect of small parts, none of these things will be the case, instead they will only have been mixed relative to perception and the same [body] will have been mixed for one person, if his vision is not sharp, but for Lynceus nothing will have been mixed), nor by division such that every part is next to another, for it is impossible to be divided in this way.³⁷

In this passage, Aristotle considers and dismisses two accounts of mixing: first, that bodies are mixed when they have been divided into small parts and juxtaposed so that the individual parts are not perceptible (327a33-5); secondly, that bodies have been mixed when every part of either is juxtaposed with a part of the other (328a1-2, 15-17).³⁸ The first account he dismisses because mixtures are homoiomeres, while juxtapositions of small parts are not (328a8-15). The second account he dismisses on the grounds that bodies cannot be divided so that every part is juxtaposed (328a3-6, 15-17). I agree with Dorothea Frede (2004, 293) that

³⁷ ὅταν γὰρ οὕτως εἰς μικρὰ διαιρεθῆ τὰ μινύμενα καὶ τεθῆ παρ' ἄλληλα τοῦτον τὸν τρόπον ὥστε μὴ δῆλον ἕκαστον εἶναι τῆ αἰσθήσει, τότε μέμικται; ἢ οὐ, ἀλλ' <ὅτε> ἔστιν ὥστε ὀτιοῦν παρ' ὀτιοῦν εἶναι μόριον τῶν μιχθέντων; λέγεται μὲν οὖν ἐκείνως, οἷον κριθὰς μεμίχθαι πυροῖς, ὅταν ἠτισοῦν παρ' ὄντινοῦν τεθῆ· εἰ δ' ἐστὶ πᾶν σῶμα διαιρετόν, εἴπερ ἐστὶ σῶμα σώματι μικτὸν ὁμοιομερές, ὀτιοῦν ἂν δέοι μέρος γίνεσθαι παρ' ὀτιοῦν. ἐπεὶ δ' οὐκ ἔστιν εἰς τὰ ἐλάχιστα διαιρεθῆναι, οὐδὲ σύνθεσις ταῦτὸ καὶ μίξις ἀλλ' ἕτερον, δῆλον ὡς οὔτε κατὰ μικρὰ σωζόμενα δεῖ τὰ μινύμενα φάναι μεμίχθαι (σύνθεσις γὰρ ἔσται καὶ οὐ κρᾶσις οὐδὲ μίξις, οὐδ' ἔξει τὸν αὐτὸν λόγον τῷ ὄλω τὸ μόριον. φαιμέν δὲ δεῖν, εἴπερ μέμικται, τὸ μιχθέν ὁμοιομερές εἶναι, καὶ ὡσπερ τοῦ ὕδατος τὸ μέρος ὕδωρ, οὕτω καὶ τοῦ κραθέντος. ἂν δ' ἦ κατὰ μικρὰ σύνθεσις ἢ μίξις, οὐθέν συμβήσεται τούτων, ἀλλὰ μόνον μεμιγμένα πρὸς τὴν αἰσθησιν καὶ τὸ αὐτὸ τῷ μὲν μεμιγμένον, ἐὰν μὴ βλέπη ὄξύ, τῷ Λυγκεῖ δ' οὐθέν μεμιγμένον), οὔτε τῆ διαιρέσει ὥστε ὀτιοῦν παρ' ὀτιοῦν μέρος, ἀδύνατον γὰρ οὕτω διαιρεθῆναι.

³⁸ There is no relevant difference between Aristotle's σύνθεσις in this passage and Alexander's παράθεσις (see *De mix.* 228.28-30).

this argument applies equally to atomism and to continuum-physics. So, Hierocles' juxtaposition $\delta\iota' \ \delta\lambda\omega\nu$ is not possible, according to Aristotle, because the requisite division is not possible. Although Aristotle does not say so explicitly, the reason is that the division would be infinite in actuality and not just in potentiality. Alexander objects to the Stoic theory on similar grounds in *De mix.* 222.4-18. Either the ingredients are actually divided to infinity or there is no actual blending, only a juxtaposition. Alexander and Aristotle both appear to consider the possibility of Hieroclean juxtaposition $\delta\iota' \ \delta\lambda\omega\nu$, but reject it because it requires an actually infinite division.³⁹ Interestingly, however, neither objects that juxtaposition $\delta\iota' \ \delta\lambda\omega\nu$ would be a mere juxtaposition and not a blend.⁴⁰

But blending is not just juxtaposition, even juxtaposition $\delta\iota' \ \delta\lambda\omega\nu$; it is juxtaposition $\delta\iota' \ \delta\lambda\omega\nu$ with *participation*. We have said nothing so far about what participation amounts to for Hierocles. However, we can see that the mereological interpretation discussed in Section 2 above fits badly here. The mereological interpretation, recall, says that the parts of the blending bodies participate in all the ingredients because they are composed of parts of all the relevant types. So, the parts of soul participate in body and soul by being composed of body parts and soul parts, and vice versa for the parts of body. Now, Hierocles, as we have interpreted him, thinks that when soul and body are blended, then every part of either is juxtaposed with parts of the other. Juxtaposition, though, entails no compositional changes. Indeed, it would be inappropriate to say that soul and body are juxtaposed whole through whole, if each part of soul is composed of body parts as well as soul parts and vice versa. Juxtaposed bodies retain their own composition. Accordingly, we should look for another interpretation of participation for Hierocles.

For the same reason Hieroclean blends avoid the problem caused by the mereological interpretation. The ingredients in Hieroclean blends are merely juxtaposed $\delta\iota' \ \delta\lambda\omega\nu$; they retain their own parts and remain mereologically intact when blended. There is no reason, then, to suspect that the preservation of the ingredients is compromised by virtue of the mereological structure of a blend.

If participation is not mereological, what is it? Our sources indicate that participation for the Stoics is not a single relation; rather, participation claims can be true in virtue of various

³⁹ Alexander seems to think that the ingredients of a blend dividing one another is a process of their parts coming to be juxtaposed: *De mix.* 221.25-34, 221.34-222.18; cf. 219.32-220.3, 231.12-19.

⁴⁰ Aristotle's objection to juxtaposition $\kappa\alpha\tau\grave{\alpha} \ \mu\iota\kappa\rho\acute{\alpha}$, that the result is not a homoiomere, may seem to apply to the second account as well as the first. However, Aristotle does not apply the argument in this way; his objection to the second account is that it requires an impossible division.

different relations (on which, more in Section 4 below). On my view, there are two sorts of relation at issue in the case of blending. First, parts of body participate in body and parts of soul in soul because they are of the nature of body and soul respectively and belong to the relevant class. This usage is well attested (*SVF* 3.76, 114; *LS* 30A = *SVF* 1.65). However, the difficult and interesting case is parts of body participating in soul and vice versa. I am going to suggest that another way to participate is to be qualitatively determined: parts of body participate in soul and parts of soul in body, because the qualities of the parts of body are at least in part determined by soul and vice versa.

Hierocles does not tell us explicitly how he understands participation, but he gives an unusually detailed description of how body and soul interact which, when coupled with our other sources for the tensile motion of pneuma in Stoic physics allows us to see that the qualities of the parts of body can be (in part) determined by soul without their acquiring soul parts, and vice versa (*Elements of Ethics* IV.38-53):

T6 Since, then, the animal is no other kind of thing than a composite of body and soul, and both are tangible, able to deliver blows, and indeed subject to pressure, and moreover have been blended whole through whole, and one of them is a perceptive power, and this one itself moves in the way in which we have explained, it is clear that the animal would perceive itself continuously. (iii) For as it stretches outward with release the soul impacts all the parts of the body, since it too has been blended with them all, (iv) and as it impacts, it is reciprocally impacted; for the body too is resistant to blows, just as the soul. (v) And the affection is realized as joint pressure and counterpressure. And inclining inward from the outermost parts, it is brought to the ruling part of the chest, so that a grasp results of all the parts both those of the body and those of the soul; and this is equal to the animal perceiving itself.⁴¹

⁴¹ Ἐπεὶ τοῖ[ν(υν) γένος οὐδ(ἐ)ν] ἔτερ[όν] (ἐστι) τ[ὸ] ζ[ῶ(ον)] ἢ [τὸ] σ(ύν)θετον ἐκ σώματος [κ(αί)] ψυχ[ῆς], ἄμφω δ' (ἐστὶ) θ[ι]κ[τᾶ] κ(αί) πρ(οσ)βλητὰ κ(αί) τῆ [π]ρ(οσ)ερεΐ[σει] δὴ ὑπόπτωτα, ἔτ[ι] δ(ἐ) δι' ὄλω(ν) κέκρατ(αι), κ(αί) [θ]ά[τερ]ον μ(έν) (ἐστὶν) αὐτ(ῶν) δύναμι[ς] (αί)]σθητική, τὸ δ' αὐτ[ὸ] τοῦτο κ(αί) τρ(όπο)ν, ὃν [ὕ]πεδείξ[αμ(εν)], κινεῖτ(αι), δηλον ὅτι δι[ι]ανεκῶς (αί)σθάνο[ι]τ' ἂν τ[ὸ] ζ[ῶ(ον)] ἑαυτοῦ. (iii) τεινομ(έν)η γ(άρ) ἔξω ἢ ψυχῆ [μ]ετ' ἀφέσ[ε]ως [πρ(οσ)β(άλ)]λει πᾶσι τ(οῦ) σώματος τ(οῖς) μέρεσιν, ἐπειδὴ κ(αί) κέκρατ(αι) πᾶσι, (iv) πρ(οσ)βάλλουσα δ(ἐ) ἀν[τι]πρ(οσ)[β(άλ)]λετ(αι)· ἀντιβατικὸν γ(άρ) κ(αί) τὸ σῶμα καθάπ(ερ) κ(αί) ἢ ψυχῆ· (ν) κ(αί) τὸ πάθος συνερειστικ[ὸ]ν ὁμοῦ κ[(αί)] ἀντερ[ε]ιστικὸν ἀ(πο)τελεῖτ(αι). κ(αί) [ἀ(πὸ) τ(ῶν)] ἔξω τ(ῶν) μερῶ(ν) εἴσω νε[ῦ]ον ἐ(πι) τ(ῆν) ἡγεμονίαν το[ῦ] στή[θους] σ(υ)ναφέρ[ετ] (αι), ὡς ἀντίληψιν γίνεσθ(αι) μερῶ(ν) ἀπά[ν]τ(ων) τ(ῶν) τ[ε] τ[οῦ] σώματος κ(αί) τ(ῶν) τ(ῆς) ψυχ(ῆς)· τοῦτ[ο] δ(ἐ) (ἐστὶν) [ἴ]σον τῷ τὸ ζ[ῶ(ον)] (αί)]σθά[ν]εσθ(αι) ἑαυτοῦ.

Here, Hierocles brings together his premises and explains why they entail that the animal perceives itself continuously. We will not give an interpretation of the entailment; for us, the important part is IV.44-9 (= my (iii)-(v)).

(iii) ('For as it stretches outward with release the soul impacts all the parts of the body, since it too has been blended with them all') describes the action of soul upon body in a blend. The soul stretching 'outward with release' is a reference to one side of the double aspect of the tensile motion of soul. Pneuma, of which soul is a kind, moves simultaneously outward and inward, and is therefore in a state of tension.⁴² 'Release' (ἄφρασις) is the outward, or expansive, aspect of this double motion. Since the soul has been blended with all the parts of the body, it 'impacts' (προσβάλλει) them all with this motion. This makes good sense, given Hierocles' understanding of the mereological structure of blends. Because every part of soul is juxtaposed with parts of body and vice versa, the outward motion of the soul will affect every part of the body. Every part of body, however minute, will be impacted by the parts of soul with which it is juxtaposed. When the soul impacts the body in this way, Hierocles says, it is itself impacted in turn, (iv): 'and as it impacts, it is reciprocally impacted; for the body too is resistant to blows, just as the soul.' Since the body is 'resistant' (ἀντιβατικόν), it strikes back at the soul, when the soul strikes it. But the soul too, as Hierocles says, is resistant. So, when the body strikes it back, the soul strikes back again. The result is that throughout the entire blend there is a continuous exchange of motion among the parts of soul and body. The soul initiates the exchange, by virtue of its outward 'release', but it is sustained by the mutual resistance of soul and body.

This account by Hierocles is remarkable for a number of reasons. First, it offers significantly more detail about the interaction of body and soul than any other source we have. Secondly, in its appeal to juxtaposition and to the mutual impacts of the parts of soul and body, Hierocles' account is reminiscent of Epicurean accounts.⁴³ The two key differences are, on the one hand, that soul and body are continuous for Hierocles and, on the other, that the characteristically Stoic notion of pneumatic tensile motion plays a central role.

Now, my claim is that the parts of body participate in soul and the parts of soul in body because of the continuous exchange of motion between soul and body. The parts of body participate in soul because soul imparts motion to them, and the parts of soul participate in body because they in turn are moved by body when it strikes back. To see this, we must turn

⁴² *De mix.* 224.23-5; Nemesius, *Nat. hom.* 2, 18.2-10 = LS 47J.

⁴³ See e.g. DL 10.62-5; Lucretius, *DRN* 3.161-7, 177-207, 231-88.

to other sources, since Hierocles is primarily interested in the self-perception of animals, not in the role of tensile motion in blending.

A number of texts report that pneuma performs a double role: on the one hand, it sustains and unifies the bodies with which it is blended, on the other hand, it makes them into the sorts of bodies that they are, imparting to them qualities and quantities.⁴⁴ Pneuma does not perform these two roles merely by being present in bodies; rather, its tensile motion is responsible. We see this in an important passage from Nemesius (*Nat. hom.* 2, 18.2-10 = LS 47J, tr. Long and Sedley, my emphasis).

T7 Now if the soul is a body of any kind at all, even if it is of the rarest consistency, what is it that sustains it? For it has been proved that every body needs something to sustain it, which is an endless regress until we reach something incorporeal. If they should say, as the Stoics do, that *there exist in bodies a kind of tensile movement which moves simultaneously inwards and outwards, the outward movement producing quantities and qualities and the inward one unity and substance*, we must ask them (since every movement issues from some power), what this power is and in what substance it consists.⁴⁵

Nemesius says explicitly that it is the outward motion of pneuma that produces qualities.⁴⁶ Hierocles, similarly, says that soul impacts the parts of body with its outward movement (τεινομένη έξω . . . μετ' ἀφέσεως). So Nemesius gives us reason to think that, when soul impacts the parts of body in a Hieroclean blend, it determines their qualities (and quantities), at least in part. The claim that pneuma qualifies bodies by virtue of tensile motion is a familiar one. That this occurs as parts of soul strike parts of body, however, is not.

It is less clear that body qualitatively affects soul when they blend. A passage of Galen may be interpreted in this way (*PHP* 5.3.8 = LS 47H = *SVF* 2.841, part), but for the most part our

⁴⁴ Nemesius, *Nat. hom.* 2, 18.2-10 = LS 47J; Plutarch, *Stoic. rep.* 1053F-1054B = LS 47M = *SVF* 2.449; *Comm. not.* 1085C-D = LS 47G = *SVF* 2.444, part; *De mix.* 224.14-17; cf. Simplicius, *In Cat.* 237.25-238.20 = LS 47S = *SVF* 2.393, part.

⁴⁵ εἰ τοίνυν σῶμά ἐστιν ἡ ψυχὴ οἰονδήποτε, εἰ καὶ λεπτομερέστατον, τί πάλιν ἐστὶ τὸ συνέχον ἐκείνην; ἐδείχθη γὰρ πᾶν σῶμα δεῖσθαι τοῦ συνέχοντος, καὶ οὕτως εἰς ἄπειρον, ἕως ἄν καταστήσωμεν εἰς ἀσώματον. εἰ δὲ λέγοιεν, καθάπερ οἱ Στωικοὶ, τονικὴν τινα εἶναι κίνησιν περὶ τὰ σώματα, εἰς τὸ ἔσω ἅμα καὶ εἰς τὸ ἔξω κινουμένην, καὶ τὴν μὲν εἰς τὸ ἔξω μεγεθῶν καὶ ποιοτήτων ἀποτελεσματικὴν εἶναι, τὴν δὲ εἰς τὸ ἔσω ἐνώσεως καὶ οὐσίας, ἐρωτητέον αὐτούς, ἐπειδὴ πᾶσα κίνησις ἀπὸ τινός ἐστι δυνάμεως, τίς ἡ δύναμις αὕτη καὶ ἐν τίνι οὐσίωται;

⁴⁶ Simplicius (*SVF* 2.452) says the same thing.

sources focus on the activity of pneuma. However, if soul and body interact in the way described by Hierocles, the mechanism is the same in both cases; soul affects body by striking it (προσβάλλειν) and body affects soul by striking it back (ἀντιπροσβάλλειν). We might suppose, then, that just as soul qualitatively affects body by striking it, so body qualitatively affects soul by striking it back. The evidence about κίνησις in general supports this. Simplicius reports that local motion (τοπικὴ κίνησις) underlies every κίνησις, including qualitative change (*In Phys.* 1320.19-21 Diels = *SVF* 2.496).⁴⁷ This suggests that when soul impacts body, soul affects body qualitatively by causing the local motions which underlie such changes. It is plausible that when body impacts soul, it similarly affects soul qualitatively by causing the underlying local motions.

Soul and body do not determine one another's qualities *simpliciter*; they do it in virtue of being the sorts of bodies that they are. The motion imparted by soul is determined by its material composition (air and fire) and its characteristic tensile motion. Likewise, the motion imparted by body is determined by its material composition (largely water and earth) and its pattern of motion and rest.⁴⁸ Body is comparatively passive and unmoving. That is why Hierocles says that body is 'resistant', while he emphasizes the motion of soul. Thus, when a part of body is moved by soul, the resultant motion is jointly determined by its own nature and that of soul, and vice versa for the parts of soul, when body strikes back. This joint determination, I suggest, is what Hierocles has in mind when he says in T6 (IV.48-9, my (v)): 'And the affection (τὸ πάθος) is realized as joint pressure and counterpressure.'⁴⁹

It is a bit unclear what τὸ πάθος means. I have translated it as 'the affection', but the term must be meant to cover both affects and conditions. The reason is that Hierocles wants to conclude that the animal perceives itself continuously, not just when it is affected. The animal is aware not just of changes to its condition and the condition of its parts, but also of the conditions themselves. So, the point is that the conditions and affections of the parts of body and soul are determined by joint pressure and counterpressure, i.e. the interchange of motion between soul and body. This interchange is a continuous process in the living animal;

⁴⁷ Here, I follow Menn's interpretation (1999, 243-247). For more general interpretations along the same lines, see Sambursky 1959, 27 and Long 1974, 158.

⁴⁸ Nemesius, *Nat. hom.* 5, 52.18-19 = LS 47D; Galen, *PHP* 5.3.8 = LS 47H = *SVF* 2.841, part. Cf. Long 1982, 39-40.

⁴⁹ This is a difficult sentence. Ramelli and Konstan render it: 'and the affect ends up being simultaneously characterized by pressure and counterpressure' (in Ramelli 2009, 13). I cleave closer to Bastianini and Long 1992, 325.

the conditions of it and its parts are sustained by the interaction of soul and body. In this way, soul and body explain the existence of the animal as the kind of thing it is.

According to this interpretation, the parts of body participate in soul because a soul modifies their pattern of motion and thereby helps determine their qualities, and the motion with which the soul does this is determined by the sort of thing soul is – *mutatis mutandis* for the parts of soul with respect to the body. There is a link between this way of participating and the way in which parts of soul participate in soul and parts of body in body. As mentioned, the parts of soul participate in soul because they belong to the class of soul; the principal reason they belong to the class, however, is that they have the right sort of pattern of motion.⁵⁰ Thus, the parts of soul participate in soul because they have the sort of pattern of motion characteristic of soul, and they participate in body because their pattern of motion is modified by motion imparted by a body, which is determined by the sort of thing body is. Similarly, with the parts of body.

This is still a step removed from Hierocles' claim in T4 that the parts of *the blend* participate in soul and body. For the blend has parts that are parts of neither soul nor body, namely those that are composed of parts from both. However, it is not difficult to see why Hierocles' claim is true. For the pattern of motion of parts composed of both soul and body will also be determined jointly by soul and body, by virtue of the fact that the motion of their parts is so determined.

In this way, Hierocles can be seen to offer an alternative account of participation. Is this account compatible with the preservation condition reported in T1? There is no reason to think not. On my interpretation of T1, the matter and characteristic qualities of each ingredient must be preserved. There is no reason to think matter is not preserved, since there is no material change involved. As for the qualities, when soul and body impact one another, they change one another's pattern of motion, but there is no reason to say that they change it to such an extent that body and soul lose their characteristic qualities. A report by Simplicius confirms this point (*In Cat.* 237.25-238.20 = LS 47S = SVF 2.393). Simplicius tells us that the Stoics distinguish between *διάθεσις* and *ἔξις*, such that *ἔξις* is a condition of pneumatic motion that can be intensified and relaxed (*ἐπιτείνεσθαι καὶ ἀνίεσθαι*), while *διάθεσις* cannot. The pneumatic motion in virtue of which particular natural bodies belong to their genera and

⁵⁰ See e.g. DL 7.138-9 = LS 47O; Philo, *Leg. alleg.* 2.22-3 = LS 47P = SVF 2.458, part; *Quod deus sit immutabilis* 35-6 = LS 47Q = SVF 2.458, part; Simplicius, *In Cat.* 237.25-238.20 = LS 47S = SVF 2.393, part; Sextus Empiricus *M* 9.81-5.

species is of the former sort. So some species members will have more relaxed motion and others more intense; yet, in all cases the general pattern is preserved. Similarly, we can say that soul and body remain within the range of their characteristic patterns of motion in a Hieroclean blend, even though the patterns are modified by their interaction. In this way, the qualities of each can in part be determined by the other, while its characteristic qualities are preserved.

So it seems that the present understanding of participation is well suited to accommodate preservation. If this understanding can be sustained, Hierocles appears to have an account of blending that satisfies both conditions reported by Alexander in T1 and T2.

4. Questions and Objections

This interpretation of Hierocles raises several questions and objections. In this section, I will address some of them. They fall into two groups: on the one hand, those that concern the provenance of the view I am attributing to Hierocles, and, on the other, those that concern the philosophical details of the view and its implications for related topics in Stoic philosophy, such as infinite division, whether bodies co-locate, and limits.

4.1 The Stoic Provenance of the Hieroclean Account

First, one might worry whether being qualitatively determined is recognized as a way to participate (μετέχειν / μετοχή) by the Stoics. This is an important question: if there is no evidence of such recognition, the interpretation will remain speculative. Our sources indicate that the Stoics used μετέχειν in a wide range of cases. Virtuous agents and actions are said to participate in virtue (SVF 3.76, 114); natural bodies participate in concepts (έννοήματα) such as 'human being' and 'horse' (LS 30A = SVF 1.65);⁵¹ rocks are said to participate in έξις, plants in φύσις, and animals in φαντασία and όρμή (SVF 2.714); functional limbs, healthy bodies, and unimpaired senses are said to participate in κίνησις and σχέσις (SVF 3.141). This suggests that there is no one participation relation for the Stoics; rather, there are several different relations in virtue of which participation claims hold. Since the Hieroclean account is otherwise plausible, it is tempting to suppose that being qualitatively determined in the proposed way is one of them. Furthermore, Plutarch provides more direct evidence (Comm. not. 1085C-D = LS 47G = SVF 2.444, part; tr. Long and Sedley):

⁵¹ See n. 22 for references.

T8 They [the Stoics] say that earth and water sustain neither themselves nor other things, but preserve their unity by participation in a breathy and fiery power; but air and fire because of their tensility can sustain themselves, and by blending with the other two provide them with tension and also stability and substantiality.⁵²

According to this report, earth and water cannot sustain themselves; rather, they are sustained by participating in a breathy and fiery power (πνευματικῆς μετοχῆ καὶ πυρώδους δυνάμεως). The way they participate in this power is by being blended with air and fire, which thereby provide them with stability and tension (τόνος). This is the other half of the double action of *pneuma* described by Nemesius in T7. The outwards motion produces qualities and quantities, the inwards motion produces unity and substance. Though Hierocles focuses on the outwards motion and Plutarch the inwards one, the mechanism is the same in both cases. T8 therefore, may be taken as evidence that the imparting of motion such as occurs through tension licenses participation claims. There is sufficient evidence overall not to be worried that the Hieroclean account fails to fit the concept of participation.

The second issue I want to consider is the relation between the accounts of Chrysippus and Hierocles. Chrysippus, recall, distinguishes blending from juxtaposition and fusion. Hierocles, however, takes blending to involve juxtaposition. *Prima facie*, Hierocles appears to disagree with Chrysippus. Bastianini and Long think that Hierocles' παράθεσις δι' ὄλων is the wrong term for Chrysippean blending, but that there is no disagreement, merely terminological carelessness on the part of Hierocles.⁵³ This diagnosis seems to me implausible and hasty.

There is no reason to impute carelessness to Hierocles, for the sort of juxtaposition Chrysippus distinguishes from blending is not the sort of juxtaposition Hierocles says it involves. Chrysippus distinguishes κῥᾶσις from παράθεσις καθ' ἀρμῆν, as exhibited in mixtures of grains and beans (*De mix.* 216.17-22). But this is not παράθεσις δι' ὄλων.⁵⁴ Of course, Hierocles might still disagree with Chrysippus; on the standard mereological interpretation of

⁵² γῆν μὲν γὰρ φασὶ καὶ ὕδωρ οὐθ' αὐτὰ συνέχειν οὐθ' ἕτερα, πνευματικῆς δὲ μετοχῆ καὶ πυρώδους δυνάμεως τὴν ἐνότητα διαφυλάττειν· ἀέρα δὲ καὶ πῦρ αὐτῶν τ' εἶναι δι' εὐτονίαν ἐκτικά, καὶ τοῖς δυσὶν ἐκείνοις ἐγκεκραμένα τόνον παρέχειν καὶ τό μόνιμον καὶ οὐσιῶδες.

⁵³ 1992, 415: 'Another example of Hierocles' carelessness or indifference with regard to strict Stoic terminology, because the term παράθεσις means juxtaposition in contrast to κῥᾶσις δι' ὄλου. Compare SVF II.473.'

⁵⁴ Similarly, DL's report that blending is διόλου and not κατὰ περιγραφὴν καὶ παράθεσιν according to Chrysippus (7.151) does not mean that blending does not involve παράθεσις δι' ὄλων.

T2, he certainly does. Hierocles himself, however, presents the theory of blending as if expecting his reader to be able to fill in the details; his invocation of the standard example of fire and iron is a case in point. The natural explanation is that Hierocles agrees with Chrysippean orthodoxy, or at least thinks he does. There are two options it seems to me. On the one hand, Hierocles might be refining Chrysippus' theory, spelling out details that Chrysippus did not and working out difficulties; on the other hand, Hierocles might simply hold Chrysippus' view, of which we happen not to have a full account. I do not think the evidence allows us to decide between these, because Hierocles provides a level of detail beyond anything reported for Chrysippus.

However, there are two points worth noting. In one intriguing passage of *De mix.*, blending bodies are referred to as ὅλα δι' ὄλων παρατιθέμενα (218.8).⁵⁵ This is what we would expect if Chrysippus and Hierocles agree that blending involves παράθεσις δι' ὄλων. Further, Hierocles' view fits perfectly with our interpretation of T3. In T3, remember, Alexander objects to Chrysippus that the ingredients of a blend cannot both be surrounded by their particular surfaces and be blended whole through whole. On our interpretation, the ingredients are meant to be surrounded by their particular surfaces, because they interact through contact only, retaining their own surfaces, and we noted that this is a sensible requirement for someone concerned with the preservation of the ingredients. Now, on Hierocles' view, the ingredients are in fact only in contact, even if *all* the parts of either are in contact with parts of the other, all the way down. And as we interpreted him, Hierocles provides a way of understanding participation consistent with this. That is exactly what Chrysippus needs to answer Alexander's objection in T3. This fact may provide a basis for arguing that Chrysippus and Hierocles hold the same view, and it certainly suggests that there is no deep disagreement between the two.

4.2 *Infinite Division, Colocation, Interaction*

Bodies for the Stoics are infinitely divisible and have no smallest parts. Since the participation claims in T2 and T4 appear to quantify over all the parts of bodies, it matters how this should be understood. Contemporary interpreters generally think that bodies are infinitely divisible and have no smallest part only in the sense that there is no end to the parts into which they can be cut. There is no actual infinity of parts of which bodies are composed.⁵⁶ This view is

⁵⁵ Todd dismisses this as a mistake: 1976, 40 n. 93.

⁵⁶ E.g. Long and Sedley 1987 i. 303; Gould 1970, 116.

hard to square with T2 and T4. The difficulty is that if there is some part left that is merely potentially blended or participating, then there is no actual blending whole through whole. Alexander makes a similar point. He argues that, since blending involves the ingredients dividing one another, either there will be an actual infinite division or there will remain parts actually unblended (*De mix.* 221.25-222.18). This is a powerful argument, especially for Hierocles whose παράθεσις δι' ὄλων very plausibly must come to be through division.⁵⁷ Moreover, T2 and T4 seem straightforwardly to refer to the parts of the ingredients. There is no indication that the parts are other than corporeally present in the same way as the ingredients. As a result, I am inclined to think that the coherence of the theory requires an actual infinity of parts and an actually infinite division, and that the texts support this interpretation.⁵⁸

Hierocles, then, holds that soul and body are juxtaposed δι' ὄλων insofar as each is divided into infinitely many parts each of which is juxtaposed with parts of the other. There is much to say about this view; I am going to consider two questions only: first, where are soul and body and their parts when they blend? Secondly, how do they and their parts come into contact in a blend? I start with the former.⁵⁹

According to Hierocles, soul and body each remain composed purely of soul and body respectively. So, contrary to the standard interpretation of Chrysippus, Hieroclean blends are not homoiomeres; some parts are composed purely of soul, some purely of body, and some are composed of both. Nevertheless, there is no continuous region occupied by the blend which is occupied purely by soul or purely by body. Any continuous region occupied by the blend will be occupied by parts of soul, parts of body, or parts composed of soul and body. Suppose that a region is occupied by a soul part. Since soul is juxtaposed with body δι' ὄλων, each part of this soul part will be juxtaposed with parts of body, and so the region in question will also be occupied by parts of body; equally, a continuous region occupied by a part of body, will also be occupied by parts of soul. One way to understand this result is that soul and body co-locate; they occupy the same region, the region occupied by the blend. Similarly, the parts

⁵⁷ According to Alexander, Chrysippus too thinks that blending occurs by the ingredients dividing one another; indeed, Alexander accepts this himself: *De mix.* 219.32-220.1, 231.10-16.

⁵⁸ This is not to say that there is no support for the standard view, just that the texts on blending do not support it. Long and Sedley share this concern (1987 i. 304). Nolan 2006 argues that the Stoics hold a gunky view of matter, according to which bodies are composed of infinitely many, actually existing parts. Overall, I am more inclined to agree with Nolan than the standard view as stated in Long and Sedley.

⁵⁹ Nolan 2006 does important philosophical work on this question.

of soul co-locate with parts of body and vice versa. A number of ancient commentators, Alexander among them, think the Stoics are committed to this.⁶⁰ However, on its own the fact that no continuous region is occupied all and only by soul or body does not mean that soul and body co-locate (Nolan 2006, 173-5). Determining what it means would require a comprehensive account of Stoic space. Here, in connection with Hierocles, let me note that it is attractive to think of the locations of soul and body as having the same structure as soul and body themselves when they are blended; just as they are divided everywhere and juxtaposed, so are their locations. Soul and body are scattered and interspersed with one another, and so are their locations. Thus described, there is no immediate temptation to say that soul and body co-locate.

Whether or not the ingredients of Hieroclean blends co-locate, it is clear that they are going to have unusual spatial properties. At a minimum, it will be true that they do not overlap mereologically and yet no part of one ingredient is found in a continuous region without the other. This might seem odd, but there is no straightforward absurdity or inconsistency.

Let us now turn to the second question, how the ingredients and their parts come into contact. Juxtaposition $\delta\iota' \acute{\omicron}\lambda\omega\nu$ requires surface contact among the parts of the ingredients. But when each ingredient is infinitely divided, it is not clear how this should be understood. The problem here is similar to one reported by Plutarch (*Comm. not.* 1080D-E). Suppose we think that A touches B with one of its parts a_1 ; since a_1 is infinitely divisible and has no smallest parts, it will have a smaller part a_2 which is closer to the apparent point of contact and so is a better candidate than a_1 ; but a_2 will equally have a part a_3 and so on *ad infinitum*.⁶¹ In the same way, we could ask how a part of soul s_1 is in contact with parts of body: if we answer 'with its parts', we could ask the same question again and so on. Plutarch tells us that the Stoics avoid this problem by saying that 'bodies touch at the limit ($\kappa\alpha\tau\grave{\alpha}$ $\pi\acute{\epsilon}\rho\alpha\varsigma$), not whole to whole, nor at a part' (*Comm. not.* 1080E). Plutarch objects to this strategy by saying that limits cannot touch, being incorporeal. I agree with Robertson that Plutarch mistakenly assumes that limits are instruments of contact, as parts would be, rather than points of contact (2004, 187-8). Of course, it remains unclear exactly how to understand the Stoic proposal, and I am not going to develop an interpretation here. I want to make two brief remarks on how the proposal relates to Hierocles.

⁶⁰ See e.g. *De mix.* 218.15-24, 219.9-12; *SVF* 2.465, 467-9; cf. Gould 1970, 109; Long 1974, 158; Sandbach 1975, 76; Nolan 2006, 174-5; Betegh 2016, 402.

⁶¹ See Robertson 2004 for discussion.

First, the Stoics seem to have been aware of the problem and taken steps to address it. If the Stoic solution works in the basic case of juxtaposition, it should also work in the case of juxtaposition δι' ὅλων. As grains and beans touch κατὰ πέρασ, when they are juxtaposed καθ' ἀρμῆν, so do the parts of soul and body, when they are juxtaposed δι' ὅλων. Secondly, this has consequences for our understanding of Stoic limits in general. Scholars disagree about whether limits are incorporeals like place, void, time and lekta, or mere mental constructs, arbitrarily imposed on bodies.⁶² Since the ingredients in Hieroclean blends are infinitely divided and their parts are in surface contact with one another, and their being so is essential for blends being distinct from fusions and juxtapositions by juncture, the surfaces of the parts, i.e. their limits, cannot be mere mental constructs. There must be an objective difference in the structure of these types of mixtures, determined by how their ingredients are related. The fact that Chrysippus holds that we have sensory impressions of the differences among the types of mixtures confirms this (*De mix.* 217.2-9). Similarly, when Alexander says in T3 that the ingredients and their parts must be surrounded by their particular surfaces, this is because their surfaces are determined by the ingredients and their parts, not by us.

These three topics, infinite division, colocation and limits, all go beyond my immediate concerns in this paper. Although they are crucial for understanding the Stoic position, and by extension the Hieroclean account, they do not pertain to it specifically. For the purposes of my argument, it is not necessary to decide the ontological status of limits, whether division is potential or actual, or whether colocation is required and why. It is sufficient to see where the details of the Hieroclean account might make a difference.

5. Conclusion

Hierocles, I have argued, gives us the tools to explain how the parts of blending bodies can participate in the ingredients of a blend, all the while preserving their substance and qualities. Thus, there is room for blending as a distinct species of mixture, besides fusion and juxtaposition by juncture. By adverting to juxtaposition whole through whole and the tensile motion of pneuma coupled with the resistance of body, the Hieroclean account presents a coherent and distinctly Stoic alternative to Peripatetic and atomist accounts. In contrast to Peripatetic accounts, the Hieroclean account does not employ potential being, instead maintaining that the particular bodies that go into the blend persist straightforwardly throughout its existence; and, in contrast to atomist accounts, it views the blending bodies as

⁶² For this debate, see e.g. Robertson 2004, Ju 2009 and Scade 2013.

continuous. The concept of pneumatic tensile motion, which turns juxtaposition δι' ὄλων into blending whole through whole, ties the account together and links it to Stoic physics more broadly. By giving a model for the interaction of pneuma and matter, the Hieroclean account can improve our understanding of the structure of the Stoic cosmos and of Stoic physics in general. However, its greatest virtue is to provide the Stoics with a coherent and philosophically interesting theory of blending, where commentators ancient and modern have seen only paradox and inconsistency.⁶³

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⁶³ I want to thank Brad Inwood, Verity Harte, Juan S. Piñeros Glasscock, Allison Piñeros Glasscock, Emily Kress, Michael Della Rocca, David Charles, as well as an anonymous referee for helpful comments and criticism. The paper has also benefited from feedback from participants at the 40th Ancient Philosophy Workshop at the University of Texas at Austin, February 2017, and from the Working Group in Ancient Philosophy at Yale University, March 2017, for which I am grateful.

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