

RH: Aristotle on the Unity of Touch

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Abstract: Aristotle is history's most famous and influential proponent of the view that there are exactly five senses. But was he entitled to hold this view, given his other commitments? In particular, was he entitled to treat touch as a single sense, given the diversity of its correlated objects? In this paper I argue that Aristotle wished to individuate touch on the basis of its correlated objects, just as he had the other four senses. I also argue, contrary to what is often supposed, that he was well-placed to do so, given his other commitments and views.

Keywords: Aristotle, senses, perception, touch, taste, object

Aristotle is history's most famous and influential proponent of the view that there are exactly five senses.¹ But was he entitled to hold this view, given his own commitments? In particular, was he entitled to treat touch (*haphê*) as a single sense? Aristotle's usual strategy for distinguishing the senses was to identify correlated "special" sense objects: features of the world one sense alone can perceive.² However, as he himself emphasizes—anticipating many later thinkers—touch discerns a diverse range of objects. This leads him to wonder, in *De anima* II.11, whether touch should count as a single sense at all.³ His own eventual position is clear: there are five senses, and touch is one of those five. But on what basis did he think he could establish its unity? Some recent commentators have claimed Aristotle ultimately abandoned his usual strategy for individuating the senses in the specific case of touch, and sought different criteria to establish its distinctiveness and unity.⁴ Others argue Aristotle was ultimately unable to individuate touch on the basis of its correlated objects in an informative, non-circular way.⁵ In

this paper, I argue, against the first group of interpreters, that Aristotle meant to individuate touch on the basis of its correlated sense objects, just as he had the other four senses. I also argue, against the broader second group of interpreters, that he was in fact well-placed to do so, given his other commitments and views.

This paper is structured as follows. I begin (section 1) by explaining Aristotle's usual strategy for individuating the senses, and by connecting this strategy to the general philosophical issue of how best to distinguish and enumerate senses. In section 2, I examine Aristotle's own presentation, in *De anima* II.11, of the challenge posed to the unity of touch by the diversity of its objects, and his initial response to this challenge. In section 3, I consider Richard Sorabji's influential argument that Aristotle abandoned his usual strategy for individuating the senses in the specific case of touch, and appealed to different criteria to establish its distinctiveness and unity. I argue we have excellent reason to reject Sorabji's conclusions. In section 4, I present my positive account of how Aristotle sought to establish the unity and distinctiveness of touch. On the view I defend, Aristotle understood touch as the sense that is uniquely responsible for discerning the fundamental differentiae of bodies qua bodies. I explain this idea, and contend, against many commentators, that Aristotle could reasonably maintain the unity of touch on this basis, given his other views. I close (section 5) by showing how Aristotle explains various distinctive features of the sense of touch by appealing to the distinctive features of its correlated special sense objects, as he understood them.

1. Aristotle on Individuating the Senses

Aristotle's view that there are exactly five senses is widely held today. However, in recent years this view has been challenged, often in light of new scientific discoveries.⁶ These challenges take three main forms. First, some argue humans have further senses, in addition to the traditional five. Common candidates include proprioception (awareness of one's own body and its position

and movement), equilibrioception (one's sense of vertical orientation and balance), and nociception (the perception of pain). Second, some argue that, of the traditional five senses, one or more should be understood as multiple distinct senses. The most common candidate for subdivision is touch, which, it is argued, should be divided into distinct senses for perceiving pressure, heat, cold, and pain, perhaps among other things.⁷ Third, some highlight forms of perception among nonhuman animals that seem irreducible to any of the traditional five senses. For example, some animals appear to perceive the world by means of echolocation (e.g. bats), magnetic fields (e.g. pigeons), electric fields (e.g. some fish), and infrared radiation (e.g. some snakes).⁸

On the basis of such considerations, philosophers and scientists working on the senses disagree about how many senses there are. Some defend the traditional five,⁹ while others posit more than five.¹⁰ What makes such debates philosophically interesting, I take it, is not so much the challenge of arriving at the correct number, but rather such questions as “what is a sense?” “how should we distinguish one sense from another?” and “how do different senses relate to one another, and to the unity of the perceiving subject?” On distinguishing the senses, theorists have advanced four main kinds of views. Some argue we should distinguish senses on the basis of the different distal features of the world they track or represent. Others argue we should do so on the basis of the proximal stimulus they detect (e.g. waves in the air). A third group favor appealing to the different sense organ(s) involved. Finally, some appeal to phenomenological criteria. For example, on the first view, sight is the sense that represents certain features of objects in the world, such as their colors. On the second, it is the sense that detects electromagnetic waves of a certain frequency. On the third, it is the sense that is exercised through the eyes (and related physiological systems). On the fourth, it is the sense that feels like seeing feels.

Aristotle is well known as history's most influential advocate of the first of these broad options: the view that the senses should be distinguished based on the different kinds of features of the world each discerns. In what follows, I call this criterion for individuating the senses the “object criterion.”¹¹ More specifically, Aristotle believed that certain kinds of features of the

world can be perceived by only one sense, and that the senses can be distinguished from one another on this basis. For example, on his view colors can be perceived in their own right only by sight; hence sight can be distinguished and defined by reference to colors. Similarly, hearing is uniquely correlated with sounds, taste with flavors, and smell with odors. Aristotle called these objects, which one sense alone can perceive, “*idia aisthêta*”: “special” or “proper” sensibles. In *De anima* II.6, he claims that these “special sensibles” are perceptible “primarily” (*kuriôs*), and that the essence of each sense is by nature relative to them:

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By “special” [*idion*] I mean what cannot be perceived by another sense and about which one cannot be deceived.¹² For example, sight is of color, hearing is of sound, and taste is of flavor, whereas touch has a number of different objects . . . these sorts of objects are said to be “special” to each sense. . . . Of the things that are perceived in their own right, the special objects are perceptible primarily [*kuriôs*], and the essence [*ousia*] of each sense is by nature [*pephuken*] relative [*pros*] to them. (*DA* II.6, 418a11–25)¹³

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To be clear, Aristotle’s view was not that each of the five senses perceives *only* its corresponding special objects. For example, it was not that sight perceives only colors. Aristotle believed that we can also *see* things like shapes, sizes and movements, and, again, in addition to these, entities such as individual human beings. However, he claims, movement, rest, shape, size, and number can all be perceived by other senses as well. For this reason, he calls these “common sensibles” (*koina aisthêta*), since perception of them is “common” to more than one sense.¹⁴ Meanwhile, bearers of these sensible qualities, such as particular people, are not perceived in their own right (*kath’ hauto*) at all, but only “incidentally” (*kata sumbebêkos*). Aristotle’s idea here seems to have been that such things do not act on the sense organs insofar as they are what they are, but only insofar as they possess qualities that *can* be perceived in their own right. For example, the

son of Diares can be perceived—but only by perceiving the color of his skin, the sound of his voice, the shape of his body, and so on. Aristotle’s claim, then, is not that sight perceives only colors (it perceives other things too), but rather that only sight perceives colors (no other sense can do that).

Aristotle also did not deny that each sense is distinctive in other ways, too. For instance, each sense has both a sense organ and a perceptual medium (even taste and touch have an “internal” medium, *DA* II.11). However, Aristotle does not distinguish and define the senses by reference to the perceptual medium. Nor, crucially, does he do so by appeal to different sense organs. Rather—certainly for the first four senses he discusses—he consistently ascribes definitional and explanatory priority to the sense objects. To take one illustrative example, Aristotle identifies the organ of smell as whatever part of its body an animal uses to discern odor. This sense organ may be constituted, and located, quite differently in different kinds of creatures. In this way, the sense organ is defined functionally: it is whatever part of its body an animal uses to perceive the relevant special sensible.¹⁵ To be sure, each sense organ must be constituted in a certain way in order to serve its purpose. For example, the eye jelly (*korê*) must be composed of a colorless liquid if it is to receive colors (*DS* 2 438a12–14, *DA* II.11, 424a7–10). Similarly, the organ of hearing must contain immobile (*akinêtos*) air capable of taking on movements from outside if it is to receive sounds (*DA* II.8, 420a9–11), and the organ of smell must be “potentially dry” if it to receive odors, since odor is “of” the dry (*DA* II.9, 422a6–7). However, such constraints on the constitution of the sense organs are themselves always explained by reference to the distinctive features of the correlated sense objects. Hence, again, the sense object is definitionally prior.

Finally, Aristotle’s strategy of appealing to sense objects to distinguish and define the senses has deep roots in general principles he accepted, concerning the explanatory priority of objects to capacities of the soul. In *DA* II.4, he prefaces his whole discussion of the capacities of the soul with the general principle that a capacity should be defined by reference to its characteristic activity, and an activity should in turn be defined by reference to its correlated

proper objects (415a14–22). He supports this principle by appealing to the general idea that actualities are prior “in account” (*kata ton logon*, 415a19–20) to potentialities, an idea he also defends elsewhere.¹⁶ Aristotle restates his commitment to the definitional and explanatory priority of object to capacity of the soul elsewhere in *De anima* (e.g. I.1, 402b14–16, II.6, 418a6–7), and also in *Metaphysics* Γ.5 (1010b35–1011a2). In the last of these passages, he defends the priority of the sense object to sense on the basis of the general principle that in causal interactions “the mover is prior in nature to the moved” (in perception, for Aristotle, the sense object is the agent and mover). In sum, Aristotle’s commitment to the explanatory and definitional priority of sense object to sense runs deep.¹⁷ I turn now to the threat posed to this general principle by the specific sense of touch.

2. The Problem of the Unity of Touch

Aristotle’s general strategy for individuating the senses, by reference to their correlated special objects, works fairly well for four of the five senses he distinguishes. This is because in each of these cases there is an obvious candidate to serve as special sense object: colors for sight, sounds for hearing, odors for smell, and flavors for taste. However, things are not so straightforward for touch. This is because, as Aristotle observes, touch appears to be distinctively concerned with several different kinds of objects:

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It is a problem whether touch is one or many. . . . Every sense seems to be concerned with a single pair of contraries: white and black for sight, sharp and flat for hearing, bitter and sweet for taste; but in the field of what is tangible we find several such pairs: hot cold, dry moist, hard soft, and whatever else is of this sort. (*DA* II.11, 422b19–27)¹⁸

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In this passage, Aristotle states the problem for the unity of touch in terms of pairs of contraries. To understand why he presents the issue in this way, we should recall that, on his view, the special sensibles all lie on spectra between contrary extremes. For example, colors lie between black and white, sounds between sharp and flat, tastes and smells between bitter and sweet.¹⁹ However, touch seems to be concerned with multiple pairs of contraries: Aristotle mentions hot/cold, wet/dry and hard/soft, “and whatever else is of this sort” (*kai tôn allôn hosa toiauta*, 422b27). Now, hotness, wetness and hardness might seem like promising candidates to serve as special sensibles correlated with touch. After all, it is at least plausible to think each is perceptible in its own right only by touch.²⁰ However, if each sense is to be individuated based on its correlated special objects, and if there are multiple special objects correlated with touch, it might seem that what is commonly called touch is not really a single sense at all, despite common ways of talking, but rather multiple distinct senses.

In *De anima* II.11, Aristotle initially responds to the problem he has identified as follows:

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There is some solution [*tina lusin*] to this problem, at least [*ge*], when it is recalled that in the case of the other senses too there are many pairs of contraries; for example, in voice not only sharp and flat but also loud and soft, smooth and rough, and other such contraries; and there are other such differences concerning color. (422b27–32)

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Here, Aristotle argues that the mere fact that touch detects multiple pairs of contraries is not alone sufficient to show it is not a single sense, since the other senses detect multiple pairs of contraries too. For example, he claims, when we hear a voice we perceive not only sharpness (*oxutês*) and flatness (*barutês*), but also loudness (*megethos*) and softness (*mikrotês*), smoothness

(*leiotês*) and roughness (*trachutês*), and so on. However, as he immediately acknowledges, there remains an important difference between touch and the other senses:

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Nevertheless, we are unable to clearly tell in the case of touch what the single underlying subject is which corresponds to sound in the case of hearing. (*DA* II.11, 422b32–33)

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For each of the other senses, it is possible to identify a single subject (*hupokeimenon*) that underlies the various pairs of contraries: for example, sound for hearing or color for sight.²¹ However, Aristotle says, it is difficult to identify any single subject underlying the various pairs of contraries correlated with the sense of touch. Aristotle does not say here whether he thinks there is, in the end, a single subject underlying the various contraries correlated with touch. Nor does he say whether touch's unity would be undermined if no such subject could be found. As a result, in this passage, he (notoriously) leaves the question of whether touch should be considered one sense or many unresolved.²²

Now, again, the interesting question here is not whether Aristotle himself thought of touch as a single sense, but rather on what grounds he felt entitled to do so. In response to this question, some interpreters have argued that Aristotle ultimately abandoned the object criterion in the specific case of touch, in the face of the problems he identifies in *De anima* II.11, and appealed to different criteria to individuate it and to establish its unity. Richard Sorabji provides the fullest and most influential statement of this view.²³ I believe Sorabji's interpretation is mistaken, and, moreover, that understanding why can prove instructive. It will therefore be useful to examine Sorabji's case for the view I wish to oppose.

3. Did Aristotle Abandon the Object Criterion?

Sorabji begins by explaining how Aristotle appealed to the object criterion to individuate sight, hearing, smell and taste. He praises Aristotle for employing this approach, since, he argues, it has considerable power. However, Sorabji also argues, we cannot successfully individuate the senses by appealing to the object criterion alone. One reason for this, he claims, is that we must apply phenomenological criteria too (66–67).²⁴ The second (and for our purposes more important) reason this strategy fails, according to Sorabji, is that it cannot accommodate touch (68–79). Sorabji argues that Aristotle was astute enough to recognize this fact, and that he therefore adopted a different approach to demarcating this one sense. Sorabji ultimately praises Aristotle, both for highlighting the power of the general strategy of demarcating senses according to their special objects, and also for his prescience in recognizing its limitations in the specific case of touch.

How did Aristotle seek to individuate touch, if not by appeal to the object criterion? According to Sorabji, Aristotle ultimately appealed to what he (Sorabji) calls the “contact criterion.” On this interpretation, Aristotle sought to individuate touch by claiming it alone operates through direct contact with the perceiver’s body. In support of this interpretation, Sorabji first appeals to linguistic considerations: the word customarily translated as “touch,” “*haphê*,” was also the standard Greek word for “contact” (69). More significantly, he cites several passages in which Aristotle seems to infer, from the fact that perception proceeded by direct contact, that it was an instance of touch, and vice versa (69–70).²⁵ For example, in *De sensu* Aristotle criticizes certain earlier theories of perception as follows:

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Democritus and most of the natural philosophers who treat of sense perception proceed quite irrationally, for they represent all objects of sense as objects of touch. Yet, if this is really so, it clearly follows that each of the other senses is a mode of touch; but one can see at a glance that this is impossible. (*DS* 4, 442a29–b2)

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Democritus believed we perceive things at a distance because “films” of atoms emitted from distant object cross the intervening distance and strike our sense organs. Our sensations vary according to the shapes, sizes, and movements of the atoms involved.²⁶ One problem with such views, according to Aristotle, is that they effectively reduce all five senses to the sense of touch, which (he claims) is absurd.²⁷ To make sense of this argument, Sorabji claims, we must read Aristotle as assuming that an instance of perception counts as an instance of touch just in case it involves direct contact between object and perceiver.

Sorabji is surely correct that for Aristotle all (and only) perception by direct contact counts as touch, broadly construed. Nevertheless, I believe we have good reason to doubt that Aristotle regarded contact as touch’s fundamental defining feature. In particular, the contact criterion leaves him with no principled way of distinguishing touch from taste. According to Aristotle, the special objects of taste (flavors) must come into direct contact with the tongue (or an equivalent organ) if they are to be perceived.²⁸ For this reason, every episode of gustatory perception satisfies the contact criterion. And in fact, Aristotle sometimes characterizes taste as a kind of touch.²⁹ This might seem to support Sorabji’s interpretation. However, Aristotle also consistently treats taste as one of the five senses, alongside touch. But the contact criterion does not leave him with any way to treat taste as a distinct sense at all. This is because every episode of gustatory perception involves contact with the perceiver’s body every bit as much as any episode of tactile perception does more generally.

Sorabji is well aware of this difficulty. In fact, he regards it as fatal for the contact criterion: Aristotle *cannot* consistently appeal to the contact criterion to individuate touch, while simultaneously maintaining touch’s distinctness from taste. Sorabji’s conclusion, in response to this difficulty, is: so much the worse for Aristotle’s actual view (“Demarcating the Senses,” 72–73). For this reason, Sorabji ends by discussing an alternative possible strategy for individuating touch, one that (he argues) was available to Aristotle, and that (he claims) Aristotle would have

done better to employ. This strategy involves appealing to what Sorabji calls the “non-localization” criterion. The basic idea is that of the five senses touch alone lacks a localized sense organ. Rather, it can be exercised through (almost) all parts of the perceiver’s body. This is sufficient to establish touch’s distinctness from taste, since taste, unlike touch more generally, is exercised *only* through a dedicated sense organ (in humans, the tongue).

Now, Aristotle undoubtedly thought touch is exercised through (almost) all parts of an animal’s body.³⁰ However, again, I do not think Aristotle considered this to be touch’s fundamental defining feature. Nor, pace Sorabji, *should* he have done so. For one thing, this strategy also faces a problem with taste; for Aristotle regarded taste as a species of touch, and we do not taste through all parts of our bodies. Moreover, we might find something unsatisfactory about defining touch in purely negative terms, as the sense that *lacks* a localized organ. Yet if we translate the view into positive terms by defining touch as the sense that is exercised through a *non-localized* sense organ—the skin, say, or the flesh—it collapses into the strategy of individuating senses based on sense organs, which Aristotle rejects. In any case, we need not dwell on the non-localization criterion, since no one claims Aristotle actually employed it. Sorabji’s claim is not that Aristotle actually appealed to this criterion to individuate touch, but rather that he would have been well advised to do so, given the problems faced by his actual view.

So much for this view, which I oppose. I turn now to my positive account. I shall argue, *contra* Sorabji and others, that Aristotle never intended to abandon the object criterion in the specific case of touch. Rather, he sought to individuate touch by reference to its special objects, just as he had the other four senses. Let me add here that, if I am right, this result should be welcome. First, it is widely acknowledged that Aristotle employed the object criterion for four of the five senses. He never says he deviates from it for the fifth. In light of his evident desire to analyze all five senses according to a common basic pattern, we should expect him to employ this criterion for touch, too.³¹ Moreover, crucially, Aristotle’s usual practice of assigning definitional priority to the sense object was not based solely on a desire to neatly individuate the

senses. Rather, as noted, it has deep roots in general principles he accepted, concerning the definitional and explanatory priority of object to activity and activity to capacity of the soul. It would be surprising indeed had Aristotle made the sense of touch alone an exception to this general rule. Finally, despite his praise for Aristotle, Sorabji's interpretation is actually uncharitable, since it makes Aristotle's views on touch fundamentally inconsistent. I believe we can do better on Aristotle's behalf.

4. Individuating Touch

Aristotle had good reason to want to distinguish and define touch by reference to its correlated special objects, much as he had the other four senses. But did actually he seek to do so—and if so, how? In particular, what serves for him as the special object of touch? What stands to touch as colors stand to sight, sounds to hearing, flavors to taste, and odors to smell? In fact, Aristotle's answer to this question is explicit. On his view, the objects of touch are the “differentiae” (*diaphorai*) of body qua body (*DA* II.11, 423b27; compare *GC* 329b6–10).³² However, as it stands this remark is obscure. What does Aristotle mean by “the differentiae of body qua body”? It might also seem unhelpful; for how does referring to a whole *set* of features help establish touch's unity? In order to answer these questions, I begin with Aristotle's remarks about the objects of touch in *De anima* II.11:

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The objects of touch [*haptai*] are the distinguishing features of body qua body [*hai diaphorai tou sômatos hêi soma*]; by such distinguishing features, I mean those that characterize the elements which we spoke about earlier in our treatise on the elements: hot and cold, dry and wet. The organ for the perception of these is that of touch. (*DA* II.11, 423b27–30)

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According to Aristotle, all bodies in the sublunary realm are entirely composed of four elements: earth, air, fire and water. In *On Generation and Corruption*—the “treatise on the elements” Aristotle refers to here—he argues that these elements correspond to four basic contraries: hot, cold, wet and dry.³³ Aristotle never makes the precise relationship between the elements and these contraries perfectly clear, and interpretation of his views on this point is controversial, in part because it is bound up with the much-debated issue of whether he believed in “prime matter.”³⁴ Nevertheless, I take the following claims to be uncontentious. First, for Aristotle, the four basic contraries—hot, cold, wet and dry—are themselves among the perceptible qualities of bodies. Second, each of the four elements derives in some way from a combination of two of the four basic contraries: fire is hot and dry, air is hot and wet, earth is cold and dry, and water is cold and wet.³⁵ Third, the four basic contraries divide into “active” powers (hot and cold) and “passive” powers (wet and dry).³⁶

Aristotle draws on these ideas in a (for our purposes) crucial passage in *On Generation and Corruption* II.2, which I quote here at length:

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[A] Since we are looking for principles of perceptible body, and since perceptible body is tangible, and tangible is that of which the perception is touch, [B] it is clear that not all contraries constitute forms and principles [*eidê kai archas*] of body, but only those corresponding to touch. For they [sc. perceptible bodies] are distinguished according to contrariety, that is, according to the contrariety of the tangible qualities. [C] That is why neither whiteness and blackness, nor sweetness and bitterness, nor similarly any of the other perceptible contraries, constitutes an element. [D] And yet sight is prior to touch, so that its object also is prior. But the object of sight is an affection [*pathos*] of tangible body, not qua tangible, but qua something else—even if it is naturally prior.

[E] So, we must first determine which of the differences and contrarieties of tangibles are primary. [F] Contrarieties correlated with touch are the following: hot cold, dry wet, heavy light, hard soft, viscous brittle, rough smooth, coarse fine. [G] Of these, heavy and light are not such as to act or be affected; for things are not called heavy or light because they act on, or are affected by, other things. But the elements must be such as to act on, or be affected by, one another; for they mix and are changed into one another. [H] But hot and cold and dry and wet are said to be such that the former act and the latter are affected. Hot associates things of the same kind (for separating, which people say fire does, is associating things of the same stock, since its effect is to eliminate what is foreign); and cold draws together and associates things of the same kind and of different stock alike; and wet is that which, being readily determinable [in general], is not determined by any limit of its own; and dry is that which is readily determined by its own limit, but not readily determinable [in general]. [I] The rest—fine and coarse, viscous and brittle, hard and soft, and the other differences—come from these. . . .

[J] It is clear, then, that all of the other differences reduce to the first four. But these do not admit further reduction; for the hot is not essentially wet or dry, nor is the wet essentially hot or cold; nor do the cold and the dry derive either from each other or from the hot and the wet. Hence it is necessary for these to be four. (*GC* II.2, 329b6–330a29)³⁷

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In this passage, Aristotle is seeking to discover the “forms and principles” of perceptible body. After remarking that (A) every perceptible body is a possible object of touch, he claims that (B) not *all* contraries that characterize bodies constitute the “forms and principles” of body *as such*, but only those corresponding to touch. Contraries that do *not* constitute the forms and principles of bodies include those that characterize the special objects of the other senses (C): black and white for color, bitter and sweet for flavor, and so on. These contraries do not distinguish bodies as such. Hence (D), “the object of sight is a quality of tangible body, not qua tangible, but qua something else”—that is, I take it, qua visible. Hence, some qualities belong to tangible bodies

insofar as they are what they are (that is, just insofar as they are bodies), whereas others belong to them in different ways; for example, insofar as they are visible. The former are the tangible qualities, correlated with touch. A body may of course have both tangible qualities and visible qualities. Nevertheless, although sight may be “prior by nature” to touch (D),³⁸ tangible qualities alone belong to the nature of body *as such*.

What are these qualities? In our passage, Aristotle provides both a long list and a shorter list. The long list consists of seven pairs of contraries: the three pairs mentioned in connection with touch in *De anima* II.11—hot/cold, wet/dry, and hard/soft—and also heavy (*baru*)/light (*kouphon*), viscous (*glischron*)/brittle (*krauron*), rough (*trachu*)/smooth (*leion*), and coarse (or thick [*pachu*])/fine (or of thin consistency [*lepton*]). This list, unlike that provided in *De anima*, gives the impression of being comprehensive. However, Aristotle does not rest content with this list of seven pairs of tangible contraries. Rather, he claims (J) they all “reduce to” (*anagontai eis*) a shorter list of just two pairs of “primary” (*prôtai* [329b16]) contraries: hot/cold and wet/dry. These contraries, however, cannot be reduced further, to a single pair. Thus, this passage provides two possible answers to our initial question. The first is that the distinguishing features of body qua body fall into seven distinct pairs. The second is that there are ultimately only two such pairs: hot and cold, and wet and dry.

What is the relationship between Aristotle’s “long list” of tangible qualities, which contains seven pairs of contraries, and his “short list,” which contains only two? In order to answer this question, it will be helpful to briefly consider how, for Aristotle, the various perceptible qualities of homoiomerous bodies depend on hot, cold, wet and dry.³⁹ For this purpose, *Meteorology* IV is especially relevant.⁴⁰ There, Aristotle sets out to explain a wide range of the characteristic dispositional properties of homoiomerous bodies, and the various processes they are prone to undergo. For example, he discusses such processes as putrefaction, concoction,⁴¹ moistening and drying, liquefying and solidifying, melting and hardening, and analyzes such dispositional properties as hardness, softness, solubility, fragility, malleability, ductility, viscosity, compressibility and combustibility. In doing so, he seeks to account for each

process or disposition by appealing to the interaction of hot, cold, wet and dry. In particular, he invokes the various ways in which the wet is “determined” (*horizein*) by the dry, and the various ways in which heat and cold affect this determination, either by creating it, reinforcing it, or causing it to break down.⁴²

Leaving aside the details, I believe the *kind* of explanation Aristotle provides in *Meteorology* IV can illuminate his views on the relationship between hot, cold, wet, and dry and the other tangible qualities. Aristotle’s goal in *Meteorology* IV was not, I take it, to eliminate from his ontology the various dispositional properties uniform bodies seem to have. Rather, it was to explain how and why uniform bodies have these features, by reference to their underlying chemical composition. Similarly, I submit, when Aristotle claims in *GC* II.2 that the other tangible qualities “reduce to” hot, cold, wet and dry, he does not mean that hardness, smoothness and the like can be reduced *away*, as if they were in reality “nothing but” the four basic powers. Rather, he means that these qualities “lead back” to hot, cold, wet and dry, in the sense that they arise from—and can be explained in terms of—interactions of these four.⁴³ In fact, Aristotle appears to have regarded hardness and the like as *emergent* causal powers: properties of bodies that are ontologically dependent on more basic features, yet which can causally influence perceivers in their own right.⁴⁴

If this much is right, it explains how Aristotle felt able to regard hot, cold, wet and dry as more fundamental, both ontologically and explanatorily, than the other tangible qualities, without concluding that they alone are real. Nevertheless, we might still wonder whether he has any principled reason for singling out the seven pairs of contraries on his “long list” in *GC* II.2, and for correlating them, and *only* them, with the sense of touch. In fact, there are two possible worries here. The first is that at least some of these qualities should really count as *common* sensibles, since they are also perceptible by another sense.⁴⁵ For example, we might think roughness and smoothness can also be perceived by sight.⁴⁶ The second worry is that Aristotle’s list could be expanded. If hardness and softness, roughness and smoothness, and viscosity and

fluidity all count as special objects correlated with touch, then why not also, say, sharpness and bluntness, or malleability, or various other perceptible qualities of bodies?

In response to these concerns, it must be conceded, first, that Aristotle may never have arrived at a stable, settled view on the precise number and identity of the special sensibles correlated with touch, or on a sharp line dividing them from the common sensibles. Nevertheless, I believe his distinction between the special objects of touch and the common sensibles was principled, at least, if not sharp. To begin with, the tangible qualities Aristotle identifies in *GC* II.2 all belong to homoiomerous bodies because of their underlying chemical constitution—that is, because of the way the wet in them is determined by the dry. This is not true of common sensibles like shape, movement and number. Second, as already noted, all special sensibles lie on spectra between contrary extremes. This seems true of such qualities as hotness, hardness, and viscosity; but it is not true of common sensibles like shape or number, as Aristotle emphasizes.⁴⁷ Third, Aristotle’s chemistry allows him to argue that the seven pairs of contraries listed in *GC* II.2 form a well-defined class: they either *are* the most fundamental qualities of bodies (hot, cold, wet and dry), or else they are the qualities of bodies most closely related to, and most readily derivable from, the basic four. In fact, Aristotle’s procedure in *GC* II.2 suggests he was thinking in precisely this way. There, at the point marked by an ellipsis in the long passage quoted above, he sets out to show how each quality on his long list is close to, and easily derived from, hot, cold, wet and dry.⁴⁸

My claim, then, is that Aristotle thought he could identify a well-defined set of sensible qualities specially correlated with the sense of touch, and that his general theory of the composition of bodies provided him with the means to do so in a principled way. This set includes the four most basic differentiae of bodies (hot, cold, wet and dry) together with certain other “lower-level” qualities of homoiomerous bodies that are especially closely related to hot, cold wet and dry, and that are most easily derived from them. For the sake of argument, let us grant Aristotle this much. Let us also grant that all of these qualities can be perceived in their own right only by touch. Even if all of this is conceded, we might still worry that Aristotle has

not yet specified a *single* special object corresponding to touch, but only an ultimate plurality of distinct objects. After all, as he insists, hot and cold, wet and dry do not reduce to a single pair of contraries. Hence, a critic might claim, touch should still count as multiple senses, on his view. If this is right, Aristotle remains ultimately unable to establish the unity of touch, based on the object criterion, given his other commitments.

To this concern, I respond simply that nothing in Aristotle's account requires correlating each sense with a single, ultimate pair of contraries. In fact, as we have seen, Aristotle is comfortable with the idea of a single sense discerning multiple pairs of contraries. What the unity of a sense requires, on his account, is not that these contraries be reducible to a single pair, but rather that they be related to one another in the right way. One way of being so related, which Aristotle highlights in *DA* II.11, is that they all qualify a single underlying subject, as sharp and flat, loud and soft, rough and smooth all qualify sounds. However, this may not be the only way. I have argued that Aristotle specified a tightly connected set of contraries that are (arguably) perceptible only by touch. I have also argued that he can distinguish these from other qualities of bodies in a principled, and, crucially, non-circular way; for these qualities, as the most fundamental differentiae of bodies as such, have more in common than simply being tangible.⁴⁹ If Aristotle has succeeded in identifying, in a non-circular way, a set of qualities perceptible in their own right only by touch, he has what he needs to define and distinguish touch based on features of the world it alone perceives. There is no need to further specify a single subject underlying them all.⁵⁰

Let us take stock. I have argued that for Aristotle touch is the sensory power that alone enables us to discern the fundamental, distinguishing features of bodies as such. This view is stated in *De anima* and fleshed out in *On Generation and Corruption*, in a discussion Aristotle directs readers of *De anima* towards. In *GC* II.2, Aristotle claims that the special sensibles fall into two classes: some belong to the natures of bodies as such, and some (such as colors) belong to bodies in some other way. Those that belong to bodies as such correspond to touch. Aristotle names these qualities by listing seven pairs of contraries, then claims they reduce to two primary

pairs: hot/cold and wet/dry. These two pairs do not reduce further. However, this does not undermine the unity of touch. For touch to count as a single sense, on the object criterion, there need be no single pair of contraries it alone can discern. Rather, there could be a well-defined set of pairs of contraries, specifiable in a non-circular way, that are perceptible in their own right by no other sense. I have argued that Aristotle provides this for the sense of touch. Hence, he can define touch, and distinguish it from the other senses, by applying the object criterion, in the way I have described.

5. The Uniqueness of Touch

The present interpretation makes Aristotle's strategy for distinguishing and defining touch consistent with his treatments of the other four senses. It also renders his views on touch consistent with the principle, articulated in *DA* II.4 and elsewhere, that objects are definitionally prior to capacities of the soul. However, it is not my intention to deny that Aristotle thought touch was special. Indeed, he clearly believed touch differs from the other senses in important and interesting ways. In this, the final section of this paper, I show how assigning definitional priority to the objects of touch in the way I have urged in this paper can help us understand, not only why touch is like the other senses for Aristotle, but also three specific ways in which he thought it is unique. I begin with his claim that touch is the most widely shared sense, the only one common to all animals. I then turn to his views on the special relationship between touch and taste. Finally, I consider his views on the composition of the organ of touch.

According to Aristotle, touch is the "first" sense, and the only one common to all animals.⁵¹ Hence, for him, possessing the capacity for touch serves as a primitive mark of animality. But why did Aristotle grant touch this kind of primacy? As is well known, Aristotle often employs teleological language when discussing the senses. In general, he holds that the senses allow animals to discern features of their environments that are crucial for their survival

and flourishing: this is how they avoid predators, find food and mates, and so on.⁵² On Aristotle's view, touch is the sense the most intimately connected to mere survival. My account of the objects of touch has the advantage of making clear why this is so. I have argued that touch alone discerns the fundamental differentiae of bodies as such. It is reasonable to think that if an animal were unable to do even this, it could not survive. This is because, as Aristotle emphasizes, an animal *is* a body, and, as such, must interact with other bodies: "since an animal is an ensouled body, and every body is tangible, necessarily the body of the animal must be capable of touch if the animal is going to survive" (*DA* III.12, 434b11–14).⁵³ If an animal had no sense of touch, it would be unable to discern and respond to its environment in even the most rudimentary ways. This explains why, for Aristotle, touch is not only the "first" sense, but also the "most necessary" one (*DA* II.2, 414a3).

The present account also suggests an appealing way of explaining Aristotle's views on the relationship between touch and taste. The basic problem is this: how is it possible to reconcile Aristotle's view that there are five senses—and hence that touch and taste are distinct senses—with his claim that taste is a kind of touch? We might conclude, with Sorabji, that this is *not* possible, and hence that Aristotle's actual view was inconsistent. Alternatively, we might deny that Aristotle really thought taste was a kind of touch.⁵⁴ However, Aristotle calls taste a kind of touch deliberately and repeatedly; these claims are not easily dismissed as loose talk on his part.⁵⁵ Fortunately, there is also a third option, on which Aristotle's stance on the relationship between touch and taste is both explicable and consistent. This solution follows directly from the definitional priority of the sense object, on which I have insisted in this paper. I submit that taste counts as a species of touch, for Aristotle, not (or at least not primarily) because both senses involve *contact*, but rather because the special object of taste—flavor (*chumos*)—belongs to nourishment, and this is tangible.⁵⁶ That Aristotle thought along these lines is clear in the following passage:

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Taste is like a sort of touch; for [*gar*] taste is of nourishment, and nourishment is a tangible body. But sound and color and scent do not nourish; nor do they bring about growth or decay. Consequently, it is necessary that taste be a sort of touch, because [*dia*] it is the perception of what is tangible and capable of nourishing [*threptikou*]. (*DA* III.12, 434b18–22)

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Put simply, taste is a kind of touch because “the tastable is a kind of tangible” (*to de geuston estin hapton ti* [*DA* II.10, 422a8]).⁵⁷ At the same time, taste is distinct from touch in general because the tastable is a well-defined and functionally significant subspecies of the tangible; for it is what nourishes an animal.⁵⁸ In this way, Aristotle’s stance on the relationship between the senses of touch and taste matches his stance on the relationship between the objects of touch and taste.

Finally, the present interpretation, on which touch is defined by reference to its correlated special objects, makes good sense of Aristotle’s claims about the unique composition of the organ of touch. On Aristotle’s view, every sense organ must be composed of some kind of homoiomerous stuff. For the other senses, this can be a simple body: for example, water for the organ of sight, or air for the organ of hearing. However, touch discerns qualities that lie between multiple pairs of contraries; hence its organ must be composed of a *mixed* homoiomerous body.⁵⁹ This body must contain some earth, but not too much, since the qualities it discerns are those that fundamentally differentiate bodies, and all bodies are partly composed of earth. These are precisely the features of flesh (*sarx*): it is a mixed homoiomerous body containing some (but not too much) earth.⁶⁰ Hence, the organ of touch must be composed of flesh, or of some analogous body in the case of bloodless animals. The basic argument is clear in the following passage:

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The organ of touch, though still homoiomerous, is the least simple of all the sense organs. For [*gar*] touch, more than any other sense, seems to be correlated with several distinct kinds of

objects, and to recognize more than one distinct category of contrasts: heat and cold, for instance, dry and wet, and other similar oppositions. Accordingly, the organ which deals with these objects is of all the sense organs the most corporeal, being either the flesh, or the substance which in some animals takes the place of flesh. (*PA* II.1, 647a14–21)⁶¹

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Here, I am interested not so much in the details of Aristotle's argument as in his order of explanation. In particular, Aristotle argues *from* claims about the nature of the objects of touch *to* claims about the composition of the sense organ. If an animal is to perceive the full range of tangible qualities, it needs a sense organ composed, not of a simple body, but of a mixed one with a preponderance of earth; hence the organ of touch is composed, not of water or air, but of flesh. In this way, again, the sense object is explanatorily prior.

In conclusion: Aristotle individuates touch, and establishes its unity, by appealing to its correlated special sensibles, just as he does the other four senses. In the case of touch, the features in question are the differentiae of body qua body: hot, cold, wet, dry, and other qualities of homoiomerous bodies that are most closely connected to, and most easily derived from, these fundamental four. Given Aristotle's understanding of chemistry, these features form a well-defined set; hence Aristotle is able to define and analyze touch by reference to them in a non-circular way. This is not to say that Aristotle presents us with a way of individuating touch we could follow today; for we cannot accept his chemistry. But what it *does* show is that Aristotle adhered to the same basic strategy for individuating and analyzing all five senses—and that he was able to do so, given his other commitments and views. As a result, Aristotle deserves his status as a foundational figure in the history of the philosophy of the senses: he was the first to apply the object criterion consistently to individuate the senses, the first to recognize the special problems touch poses for this strategy, *and* the first to argue that, despite these problems, the senses number exactly five.⁶²

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¹ Aristotle is widely identified as the originator of the common view that there are five senses. He was almost certainly the first to present it systematically, although it is possible the view was already familiar in his day. For a concise overview of the history of this idea, focusing on debates about the unity of touch and the classification of the perception of pain, see Karl Dallenbach, “Pain: History and Present Status,” 331–35. Contemporary discussions of the senses frequently begin with Aristotle, who is often used as a foil by those wishing to argue there are actually more

than five. There can be no serious doubt that Aristotle held there are exactly five senses. For instance, he organizes his whole discussion of perception in *De anima* (and elsewhere) around the five senses—sight, hearing, smell, taste and touch—and argues explicitly that there can be no more than these five in *DA* III.1.

² I explain and discuss Aristotle’s basic strategy for distinguishing the senses below.

³ *DA* 422b17–33. In his recent book on touch, Matthew Fulkerson credits Aristotle with being the first to draw attention to the challenge posed to the unity of the sense of touch by the diversity of its objects (*The First Sense*, 114). Fulkerson defends the unity of touch against this challenge, albeit on different grounds from those I ascribe to Aristotle. Aristotle also highlights touch’s objects’ variety in *DA* II.6, 418a13–14, *PA* II.1, 647a16.

⁴ Most notably Richard Sorabji, “Demarcating the Senses.” Sorabji’s paper remains influential, and is widely anthologized (e.g. in Fiona Macpherson, *The Senses*). Thomas Johansen explicitly follows Sorabji on this point; he asks, regarding touch, “why does Aristotle deviate from his usual practice of defining a sense exclusively by its proper object?” (*Aristotle on the Sense Organs*, 184).

⁵ In addition to Sorabji, these include John Beare (*Elementary Cognition*, 190); R. D. Hicks (*Aristotle, De Anima*, 361, 405); David Hamlyn (*Aristotle: De Anima II and III*, 106); Stephen Everson (*Aristotle on Perception*, 34); Ronald Polansky (*Aristotle’s De Anima*, 324); and Christopher Shields (*Aristotle: De Anima*, 243). Of these interpreters, some (e.g. Hamlyn) argue Aristotle cannot informatively establish touch’s unity at all, due to the circularity of his account, while others (e.g. Polansky) claim he *can* do so, but only by invoking criteria other than the correlated sense object.

⁶ My overview of the main positions and arguments in this debate, in this and the following paragraph, is indebted to Macpherson’s introduction to her 2011 edited volume *The Senses*.

⁷ Such arguments often proceed by appealing to the distinct physiological mechanisms and processes involved in perceiving each thing—for example, different receptors in the skin. For

overviews of recent views on the unity and disunity of touch, and of the scientific findings used to support them, see Fulkerson, *The First Sense* and “Touch.”

⁸ For a convenient overview of evidence concerning the senses of non-human animals, see Howard Hughes, *Sensory Exotica*.

⁹ Matthew Nudds defends the view that there are exactly five senses, on the basis that this view is so deeply rooted in common sense that it has become part of our ordinary conception of what a “sense” is (“The Significance of the Senses”).

¹⁰ Sometimes *many* more: “Five is just not enough to account for the huge range of sensory possibilities of which the human species is capable; seventeen senses is probably a more accurate count” (Rivlin and Gravelle, *Deciphering the Senses*, 17).

¹¹ For a recent attempt to defend the unity of touch by appeal to the object criterion, see de Vignemont and Massin, “Touch.” They claim touch’s distinctive object is *pressure*. Regardless of the merits of their view, it could not have been Aristotle’s—not only because it excludes hot and cold (as they acknowledge), but also because Aristotle regarded the special objects of touch as qualities of bodies existing independent of the perceiver.

¹² For the purposes of this paper, I set aside the question of what Aristotle means when he claims that the perception of special sensibles by their correlated special sense is unerring. For discussion of this issue, see my “Aristotle and Alexander on Perceptual Error.”

¹³ Translation based on Shields, *Aristotle: De Anima*, slightly modified.

¹⁴ In *DA* II.6, Aristotle suggests the common sensibles are those features of the world that can be perceived in their own right (*kath’ hauto*) by *all* of the senses (418a10–11, 19). This leaves it unclear how to classify features perceptible in their own right by more than one sense, but not by all five. It seems there are such features (e.g. can I smell a shape?), as Aristotle himself acknowledges in *DS* 4 442b7, where he suggests some common sensibles are perceptible only by sight and touch. Like most commentators (ancient and modern), I take his considered view to have been that common sensibles are perceptible in their own right by *more than one* sense, but not necessarily by all five.

In *De anima* II.6, Aristotle lists as common sensibles motion (*kinêsis*), rest (*êremia*), number (*arithmos*), shape (*schêma*) and magnitude (*megethos*) (418a17–18). Compatible lists appear in *DS* I, 437a8–9, and *Insomn.* 1, 458b4–6. In *DA* III.1, 425a14–16, he adds “unity” (*hen*). In *DS* 4, 442b5–7, he includes the rough (*to trachu*), the smooth (*to leion*), the sharp (*to oxu*) and the blunt (*to amblu*). On the classification of roughness and smoothness as common sensibles see below, n.46. In *Mem.* 1, 450a9–10, he claims we perceive magnitude and motion by means of that by which we perceive time—although he never calls time a common sensible.

¹⁵ Aristotle thought the sense organs of different creatures can vary widely in location and structure: for example, insects smell through the middle part of their bodies (*PA* II.16 659b16–17). We can nevertheless tell that creatures such as insects and fish *have* a sense of smell because their behavior shows they discern odor (*DS* 5 444b7–15, *DA* II.9 421b9), even though their organs of smell are difficult to discern (*DS* 5 444b15, *HA* II.13 505a33–35). The important point here is that what *makes* a bodily structure an organ of smell is that it is what an animal uses to discern *odor*. Aristotle generally showed little interest in the details of the physiology of the sense organs, beyond the kinds of general features listed in the main text, each of which reflects the nature of the sense object: for example, the organ of smell must be “potentially dry” since odor is “of” the dry. On the connection between the nature of odor and the drying of the organ of smell, see my “Aristotle on Odour and Smell.”

¹⁶ On the general priority of actuality to potentiality, see especially *Met.* Θ.8.

¹⁷ For further discussion of Aristotle’s general principle that objects have definitional priority to powers of the soul, see Johansen, *Powers*, Ch.5. Aristotle was probably influenced to adopt this principle by Plato, who argues, in *Republic* V (477c–d), that powers (*dunameis*) are differentiated primarily by what they are “set over” (*epi*).

¹⁸ Translation based on that of Smith in *The Complete Works of Aristotle*, edited by Jonathan Barnes.

¹⁹ As Hicks puts it: “To the single province of each sense corresponds a single contrariety, a sort of scale ranging from opposite to opposite and including every possible difference” (*Aristotle*,

De Anima, 414). See e.g. *DA* 426a27–b7, *DS* 439b20 and following, 442a12–17, 442b17–19, 448a8–12, *Metaph.* 1043a10–12. In these passages, Aristotle often characterizes determinate special sensibles (e.g. particular colors, flavors, or odors) as “ratios” (*logoi*) of two opposite extreme qualities. For example, different colors result from the mixture of black and white in determinate ratios (*DS* 3, 439b20 and following); similarly, particular flavors arise from the mixture of sweet and bitter (*DS* 4, 442a12 and following). This feature of Aristotle’s account is well emphasized by Deborah Modrak, *Aristotle: The Power of Perception*, 56–62.

²⁰ One might object that we can perceive such qualities as hotness and wetness by other senses as well; for example, that we can *see* that something is hot (say, by seeing steam rising from it) or wet (say, from the way a liquid moves). Here, Aristotle might respond that we “see” such features only by inference, not in their own right. The notion of perceiving a sensible feature “in its own right” is difficult to formulate precisely. However, there surely is an important difference between concluding something is hot from seeing steam, or hearing a sizzle, and feeling its heat. Aristotle might capture this difference by saying that only in the latter case does the sensible in question exercise its distinctive causal power on the perceiver’s sense organ.

²¹ I take *hupokeimenon* to have here its usual sense of “underlying subject.” It cannot here mean “genus” (pace Polansky, *De Anima*, 324). For one thing, sound is not a genus to which sharp and flat, rough and smooth, loud and soft belong as species. Rather, sharp, loud, and the like are qualifications or modifications of an underlying sound.

²² In his paraphrase of Aristotle’s *De anima*, Themistius claims Aristotle ultimately concluded there are multiple different tactile senses (and, in fact, multiple internal organs of touch), corresponding to the different pairs of opposites touch discerns (76, 3–16). Themistius’s interpretation influenced some medieval thinkers, including Avicenna and Averroes. Among modern interpreters, Beare expresses sympathy for Themistius’s account (*Elementary*, 190). However, the vast majority of commentators, both ancient and modern, have agreed that Aristotle believed there are exactly five senses—and for good reason, as noted above (n.1). In this paper, I show how it is possible to read Aristotle as believing there are five senses—and

hence as believing touch is a single sense—*despite* the challenge to its unity he highlights in *DA* II.11.

²³ Sorabji, “Demarcating the Senses.” See also n.4 above.

²⁴ In claiming we *must* appeal to phenomenological criteria if we are to successfully differentiate the senses, Sorabji explicitly follows the arguments of H. P. Grice, “Some Remarks About the Senses.”

²⁵ As instances of Aristotle inferring that perception is tactile from the fact that it involves contact, Sorabji cites *DS* 4, 442a29–b3 (quoted), *DA* III.12, 434b11–19, *DA* 424b27–28. As instances of the converse inference, that perception must involve contact if it is tactile, he cites *DA* 422a8–16, 434b12–13.

²⁶ Our most important source for Democritus’s views on perception is Theophrastus’s *De sensu*, 49–82.

²⁷ Compare the similar argument in *DS* 3, 440a15–20.

²⁸ Aristotle contrasts taste with sight and the other “distance” senses in *DA* II.10 (422a8 and following), on the basis that gustatory perception requires contact with the object perceived.

²⁹ E.g. *DA* III.12, 434b18, 21; *DS* 4, 441a3. See section 5 below.

³⁰ The exceptions are bones, hair, nails, and the like. According to Aristotle, we cannot exercise touch through these bodily parts because they contain too great a preponderance of earth (*DA* III.13, 435a24–b1).

³¹ Aristotle sought to include the same basic elements in his analysis of touch that he had included in his analyzes the other four senses: sense object, perceptual medium, sense faculty, sense organ, activity of perceiving. He also clearly intended to analyze tactile perception in the same basic terms as vision, audition etc. For instance, on his account, tactile perception too involves a sense object acting on a perceiver’s sense organ so as to assimilate the perceiver to itself, and thereby make itself be perceived—an occurrence which involves the reception of sensible form “without the matter.” My claim here is simply that, given the common structure of

Aristotle's analyses of all five senses, we have excellent reason to expect the sense object to play the same central role in his analysis of touch that it plays in his discussions of the other four.

³² For Aristotle, *diaphorai* are generally the “differentiae” or “distinguishing features” that divide kinds into sub-kinds, or genera into species. See e.g. *Categories* 1b16–24, *Topics* 101b17–19, *Metaph.* 1018a38–1018b8.

³³ See especially *GC* II.3, 330a30 and following

³⁴ The literature on this issue is extensive and complex. For a recent discussion, with references to the work of scholars on either side of the basic debate, see Cohen, “Alteration and Persistence.” For the purposes of this paper, nothing important hangs on the question of whether Aristotle believed in prime matter.

³⁵ *GC* II.3, 330b1–5.

³⁶ See e.g. *GC* II.2, 329b23–31 (quoted below, marked “H”). There, Aristotle says hot and cold are such as to act (*poiêtika*), while and wet and dry are such as to be acted upon (*pathêtika*). The wet is not determined (*aoriston*) by its own limit, but is readily determinable (*euoriston*) by other things; the dry is the converse.

³⁷ Translation based on that of Joachim in Barnes, *Complete Works*, somewhat modified. Reading the text of Mugler.

³⁸ Why is sight “prior by nature” to touch? Perhaps because, according to Aristotle, sight provides those animals that have it with more information about the world than any other sense does. Thus, in *Metaphysics* A, Aristotle famously claims that “sight, more than any other sense, provides knowledge and clarifies the differences among things” (*Metaph.* A.1, 980a21–27). Cf. *DS* 1 437a3–11.

³⁹ For Aristotle, a “homoiomorous” body is one of which each part has the same properties as the whole. The body is therefore “like-parted,” or “uniform.” Such bodies can be either “simple” (when comprised of a single element) or “mixed” (when comprised of multiple elements). Aristotle believed all genuine mixtures are homoiomorous. For Aristotle's views on mixture, see

GC I.10, with Dorothea Frede “*On Generation and Corruption* I.10: On Mixture and Mixables”; John Cooper “A Note on Aristotle on Mixture”; Theodore Scaltsas “Mixing the Elements.”

⁴⁰ The authenticity of *Meteorology* IV has sometimes been questioned, but is now fairly widely accepted. The basic case for its authenticity is made by David Furley “The Mechanics of *Meteorologica* IV: A Prolegomena to Biology,” and restated by Eric Lewis “Introduction.”

⁴¹ For Aristotle, “concoction” (*pepsis*) is a chemical transformation occurring when an organism’s proper heat “masters” and “perfects” the moist, causing it to become hotter, thicker and dryer in a way useful to the organism.

⁴² For example, ripening (*pepansis*) occurs when heat causes the matter of a thing to become thicker and dryer, transforming what was previously watery into something earthy, and in the process making it more determinate (*Meteor.* IV.3, 380a11–27). For discussion of the notion of “determination” in Aristotle, focusing on his use of *sunistanai* and *horizein* in *Meteorology* IV, see Lewis, “Introduction,” 27–34.

⁴³ Johansen, *Sense Organs*, 181n.8 helpfully observes that when Aristotle uses “*anagō*” he does not normally mean the things “reduced” are “nothing but” what they are reduced to. Johansen cites as examples *A.Pr.* 1.32 46b40 (the other figures of a syllogism “lead back” to the first, which is more understandable and immediately persuasive) and *Phys.* II.3 (a problem is “led back” to the four causes, which provide the explanation).

⁴⁴ Although I cannot defend the view here, I am inclined to think Aristotle regarded all perceptible qualities other than hotness, coldness, wetness and dryness as emergent causal powers: ontologically dependent upon, but irreducible to, hot, cold, wet, dry, and their interrelations. It seems to me we must read Aristotle in this general way if we wish to ascribe to him the following three views, all of which he appears to have held: (i) sensible qualities are real features of bodies, (ii) sensible qualities are causally efficacious in their own right, and (iii) sublunary bodies are ultimately entirely composed of earth, air, fire and water. It is uncontroversial that Aristotle subscribed to (iii). Claims (i) and (ii) together represent the kind of perceptual realism he is widely thought to have endorsed. Incidentally, I agree with Anna

Marmodoro that Aristotle's commitment to perceptual realism did not require him to regard sensible qualities as *sui generis* features of the world, disconnected from the underlying chemical constitutions of bodies (*Aristotle on Perceiving Objects*, 125–55). For an opposing view, see Sarah Broadie, "Aristotle's Perceptual Realism." For more on Aristotle's perceptual realism, see e.g. Todd Ganson, "What's Wrong with an Aristotelian Theory of Sensible Qualities?"; Justin Broackes, "Aristotle, Objectivity and Perception." On the advantages of reading Aristotle as an emergentist, see Victor Caston, "Epiphenomenalisms, Ancient and Modern."

⁴⁵ On Aristotle's conception of common sensibles, see n.14 above.

⁴⁶ In *De sensu* 4, Aristotle accuses the atomists of reducing the special sensibles to the common sensibles. He takes as his examples their claim that black is rough and white is smooth (442b10–12). Here, he appears to treat roughness and smoothness as common sensibles, rather than as special sensibles correlated with touch. It is hard to avoid concluding that Aristotle is inconsistent on this point. In fact, I believe he *is* inconsistent, but that his inconsistency is explicable and instructive; for perhaps he sometimes envisaged roughness and smoothness as qualities of homoiomerous bodies based on their chemical constitution, and sometimes as products of a body's shape. In the former contexts, he classified them as special sensibles correlated with touch. In the latter contexts—as in his critique of atomism—he treated them as common sensibles.

⁴⁷ "All of the [special] sensibles involve contrariety; e.g. in color white is contrary to black, and in flavor bitter is contrary to sweet. But no shape is thought to be contrary to any other shape; for to which of the polygonal figures is the spherical figure contrary?" (*DS* 4, 442b17–21).

⁴⁸ *GC* II.2, 329b31–330a12. Aristotle claims here that the fine derives from the moist (and the coarse from the dry) since it is the nature of the moist to adapt to, and fill up, gaps; that the viscous is the moist modified in a certain way, whereas what is brittle is so because it has become completely dry; and that softness derives from moistness, since both have the tendency to yield, whereas the hard is the solidified (*to pepêgos*), and that which is solid is so because it is dry. My claim is of course not that Aristotle provides here entirely satisfactory accounts of how

these other tangible qualities of bodies derive from hot, cold, wet and dry. Rather, it is that this is the *kind* of account he considered possible and aimed to provide.

⁴⁹ It is often argued that Aristotle was unable to distinguish the objects of touch in a non-circular way. For example, Hamlyn writes that, for Aristotle, “there is nothing that they [sc. the objects of touch] have in common except that they are tangible,” and criticizes Aristotle’s account on this basis (*Aristotle: De Anima II and III*, 106). Similarly, Hicks writes: “There [in *GC* II.2] A. asks what are the qualities of body as such and replies the opposites that fall under touch. Here [in *DA* II.11] he has to enumerate the different qualities that fall under touch and says they are the properties of body as such” (*Aristotle, De Anima*, 412). To the best of my knowledge, only Everson has argued *both* that Aristotle’s account was circular *and* that this posed no problem for him (*Aristotle on Perception*, 34). I agree with Hamlyn (and e.g. Shields, *Aristotle: De Anima*, 225), against Everson, that Aristotle could not *informatively* define touch as the sense by which we perceive tangible qualities, while at the same time defining tangible qualities as those perceptible by touch. However, I have argued that Aristotle’s account was not in fact circular in this way.

⁵⁰ We might think we *can* specify such an underlying subject: *body as such*. However, talking in this way is potentially misleading. For Aristotle, hot, cold, wet, and dry, which are themselves perceptible qualities, just *are* the most fundamental qualities of bodies. They are not reducible to any purely quantitative notion, as talk of underlying “body as such” might easily seem to imply.

⁵¹ Aristotle calls touch the “primary” or “first” (*prōton*) sense at *DA* II.2, 413b4–5. He claims touch is common to all animals often (e.g. *DA* II.2, 413b8–9, 414a2–3; III.12, 434b23–24; III.13, 435b13–19; *DS* I, 436b12–15). He sometimes also claims every animal must have the sense of taste (e.g. *DA* III.12, 434b21–23, *DS* I, 436b12–15; cf. *DA* II.3 414b6–9), reflecting his idea that taste is a kind of touch. On the relationship between taste and touch, see below.

⁵² See especially *DA* III.12.

⁵³ Cf. Cynthia Freeland: “in the *De Anima* it is reasonable for Aristotle to attempt to explain animals’ possession of the sense of touch teleologically, as sort of adaptation or purposive

suitability to the world as it is, namely a tangible world” (“Aristotle on the Sense of Touch,” 245).

⁵⁴ For example, according to Shields, “Aristotle did not intend to suggest that the objects of taste are a subspecies of the objects of touch,” since, on that view, “taste would merely be a kind of touch, with the result that there would be four senses, not five” (*Aristotle: De Anima*, 240). I agree with Shields that Aristotle assigned definitional priority to the sense objects, and thought there are five senses. However, I disagree that his claim that taste is a kind of touch (see next note) is incompatible with his view that there are five senses.

⁵⁵ For example: “taste is like a kind of touch” (*he geusis esti hôsper haphê tis*, *DA* III.12, 434b18); “it is necessary that taste be a kind of touch” (*tên geusin anankê einai haphê tis*, *DA* III.12, 434b21); “taste is a kind of touch” (*hê de geusis haphê tis estin*, *DS* 4, 441a3).

⁵⁶ In *De sensu* 4, Aristotle argues that flavor (*chumos*), the special object of taste, is an “affection” (*pathos*, 441b20) of the moist brought about in it by the action of dry and earthy things (441b15–21). I take his view to have been that tangible bodies that contain such moisture have flavor, and these bodies are both tastable and nourishing. That is why the perception of flavor by taste—and especially of sweetness (“everything is nourished by what is sweet,” 442a2)—enables animals to locate nourishment.

⁵⁷ By “the tastable” (*to geuston*), I take Aristotle to mean what *has* flavor. This is not to deny that flavor too is tastable (compare Aristotle’s remark, at *DA* 425b18–19, that we see “color or what has color”). To the objection that what we see is tangible too, I would respond that what has color does not have it *qua* tangible (*GC* 329b14–15), whereas what has flavor *does* have it *qua* tangible, as evidenced by its ability to nourish.

⁵⁸ “Flavors are an affection or privation, not of everything dry, but of the nourishing” (*DS* 4, 441b23–25); “it is insofar as it is tastable [*hêi geuston*] that what animals receive nourishes” (442a1); nourishing things “are in the tangible kind [*en tōi haptōi genei*]” (*DS* 5, 445a9); “sounds, colors and odors contribute nothing to nourishment, but flavor is one of the tangibles

[*ho de chumos hen ti tôn haptôn estin*]” (*DA* II.3, 414b10–11). Cf. *DA* III.12, 434b21–22 (quoted in the main text).

⁵⁹ *DA* III.12, 434b9–11; III.13, 435a11–14.

⁶⁰ For Aristotle’s views on the nature of flesh, see *PA* II.8, *HA* III.16. Aristotle explains why the body of an animal cannot be composed entirely of any one element in *DA* III.13, 435a19–24: “None of these sorts of elements [sc. elements other than earth] could be the body of an animal. Nor, indeed, could an earthen one [alone]. Touch serves as a sort of mean for all of the objects of touch, and the sense faculty is receptive, not only of the differentiations belonging to earth, but also of hot and cold and of all the other objects of touch.”

⁶¹ Cf. *PA* II.1, 647a19–21. Incidentally, Aristotle’s claim that the organ of touch is composed of flesh is not incompatible with his claim, in *DA* II.11, 423b17–26, that flesh is the *medium* of touch; for it is possible that *both* medium *and* organ (located in the vicinity of the heart, *DS* 2, 439a1–2) are composed of flesh. Indeed, Aristotle’s remarks in *PA* II.8, 653b19–30, suggest precisely this view. In any case, for present purposes there is no need to determine how exactly Aristotle conceived of the relationship between the heart and the flesh nearer the body’s periphery (on this issue, see Gareth Matthews, “Aristotle on the Organ of Touch”). Rather, I focus here solely on Aristotle’s claims about the composition of the organ of touch.

⁶² Earlier versions of this paper were presented at the University of Guelph and at the University of Western Ontario. I would like to thank the members of these audiences, as well as two anonymous referees for this journal, for their helpful questions, comments, and advice.