4
Taste and Smell
With Some Remarks on Touch

4.1 Introduction

Aristotle's description in *De Anima* and parts of *De Sensu* of how animals, including human animals, perceive by tasting and smelling, is the central focus of this chapter.

Many post-Cartesian theories of perception share, as we have noted, two assumptions:

[A] There is a purely psychological type of feature essentially involved in perceiving, such as being aware of, or perceptually discriminating, a taste or smell;

[B] All the types of event essentially involved in perceiving are either purely psychological or purely physical or a combination of the purely psychological and the purely physical.[1]

The first assumption can be developed in a variety of ways. In some accounts, we are, in tasting, presented as aware directly of an internal object, a mind-dependent taste, the content of a sensation, which (in some way) represents the external object. In others, we are aware in addition of an external object on the basis of our direct awareness of an internal, mind-dependent object. In still others, the relevant awareness is directly of an external flavoured object.[2] However, in all these accounts, there is an act of awareness whose definition does not contain reference to an internal physical event or physical property in the perceiver. I shall call awareness, so defined, purely psychological. Such accounts inherit, and need to address, our post-Cartesian problem: how does awareness, so understood, relate to the relevant internal physical events, states with their physical properties?

Spiritualist and non-reductionist interpreters agree that Aristotle, in his account of perceiving in *De Anima* and *De Sensu*, shared assumption [A]. In Chapters 5 and 6, I shall argue, in his account of perception he rejected both of these

[1] By 'combination' is intended any relation between two definitionally distinct events or two definitionally sets of features (such as properties). The relevant relations may include necessitation or supervenience and are not confined to mere conjunction (or correlation).

[2] In these views, the psychological extends beyond the body. John McDowell has developed this view in a series of papers: see, for example, his (1998: 431–91).

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assumptions. Properly to understand his thinking about perception, we need to recover his fundamentally different conception of the psychological.

4.2 Some reminders

Aristotle, it was suggested in Chapter 1, defined anger as a hot, physically qualified, desire for revenge. The type of desiring is an inextricably psycho-physical process (*kinēsis*) with an impure, inextricably psycho-physical, form. It is, in the terms introduced in Chapter 2, the realization of an inextricably material goal-directed capacity. The relevant processes (and capacities) in Aristotle's account are neither purely psychological nor purely physical. Aristotle offered two sets of considerations in favour of these claims. In the case of anger:

[H.1] If there were no appropriate bodily condition present, there would be no suffering of the relevant type

[H.2] The nature of the bodily condition present causally affects the nature of the suffering [*pathēsis*].

In Aristotle's account, the process (or suffering) in question is defined in terms of its inextricably psycho-physical form: it is a hot (boiling-blood) desire for revenge with certain efficient causal antecedents (403a26–7). He also held that the relevant type of heat or blood boiling cannot be defined without essential reference to revenge: it is a desiring-revenge type of heat. In his view:

[H.3] There is one and only one process essentially involved in being angry: the instantiation of one inextricably psycho-physical process type: boiling of the blood for the sake of revenge. No further purely physical process (type or token) is essentially involved in being angry. (This will be true even if some physical processes are necessary background conditions.)[3]

In Chapter 2 it was suggested that Aristotle's view of these emotions parallels his account of the forms of natural objects, which in turn was motivated by his aim of accommodating the latter's role in efficient and teleological causation. In the present chapter, I shall argue that his discussion of tasting, smelling, and touching follows the pattern set by his discussion of anger, fear, and desire (as set out in Chapter 3). [H.1] and [H.2] considerations suggest that these types of perceiving are essentially enmattered in just the way anger is: they have inextricably psycho-physical, impure, forms. They are not defined by decomposition into separate components, one of which is a pure psychological component, definable without

[3] As Burnyeat (2001) suggested they might be.

reference in the definition to matter. His view is motivated, once again, by his view of the relevant psychological phenomena (as captured by the form) as per se causes and effects of bodily (or material) processes. I shall further suggest that his discussion exemplifies the pattern set by [H.3]. This is why there is no threat of over-determination by two independent causal processes, one psychological, the other physical. The processes involved are, as was to be expected, inextricably psycho-physical with unified inextricably enmattered causes and effects. His account follows the pattern set by his theory of the emotions and of desire.

Spiritualist interpreters have argued that Aristotle, despite initial appearances to the contrary in *De Anima* A.1, did not apply the model he developed for anger and fear to perception. Whatever his original intentions may have been, in *De Anima* B.5 he gave reasons not to do so, arguing that perceiving, unlike anger or desire, is not a genuine process at all, and hence (*a fortiori*) not an essentially psycho-physical one. In their account, he defined perceiving as essentially only a change in relation, a 'mere Cambridge change', not as a real process (or activity) in the subject of change itself.

I shall challenge their interpretation. While in *De Anima* B.5 Aristotle refined his ontology, he did not, or so I shall argue, offer an account of perception that differs radically in the way they suggest from that of the emotions in *De Anima* A.1. While he presents perceiving as an activity, it is nonetheless an inextricably psycho-physical activity. In his discussion of perception, he is, in effect, further developing his account of processes, activities, and the relevant capacities: the ontology required for his theory. He is not, it should be noted at the outset, relying on the undifferentiated category of events deployed in most contemporary writing on this topic and exemplified in Assumptions [A] and [B].[4] His account of perception differs in important ways from those with which we are most familiar in part because it rests on his own distinctive ontology. This will become clearer in considering his detailed discussion of ontological issues in *De Anima* B.5.

4.3 Perceiving: ontology refined

In *De Anima* A.1, Aristotle talked of anger as a process (*kinēsis*). In *De Anima* B.5, he distinguishes two types of sufferings (*paschein*: 417b2) or changes (*metabolē*: 417b17), separating:

[Type 1] changes: changes which are 'a type destruction by a contrary' (417b2)

[4] We have been accustomed to talk of events because of our familiarity with the work of Davidson, Russell, and McTaggart.

and

[Type 2] changes: changes from potentiality (or capacity) to actuality: *entelecheia* (417b3–5) in which 'there is instead a preservation of what is potentially [in some way] by what is actually [in the same way] where the former is like the latter as potentiality stands to actuality'.

Some or all [Type 2] changes, he says, are either not quality changes at all or else a different type of quality change (417b6–8). Since quality changes are the relevant types of processes (*kinēseis*), these [Type 2] changes are either not processes at all or else a different type of process from [Type 1] changes.[5] He also provides, or so it seems, two examples of [Type 2] changes. While in both the initial capacity is maintained throughout the change, they differ in important respects. In the first case [Type 2A], the subject exercises knowledge already possessed (417b5–12), while in the second [Type 2B], the subject acquires knowledge: as a child does when taught (417b12–15).

Aristotle describes the former case, that of exercising knowledge, as follows:

> The one who has knowledge becomes a theorizer, which change (becoming) is either not a quality change (for it is a change towards itself and the relevant actuality) or a different kind of quality change.[6] This is why it is not a fine thing to say that the thinker, whenever they think, undergoes a quality change or the builder whenever they build. (417b5–9)

The transition to being a theorizer (being an actual, that is an active, knower) consists in the activity of using one's knowledge. In the same way one becomes an actual thinker (or builder) in virtue of thinking or using one's skill as a builder. In the case of knowledge, the change from the state of being a potential to that of being an actual knower consists in the activation of the knowledge at one's disposal. It is not good, Aristotle comments, to describe this activity as a quality change. To do so is either literally false (if it is not a quality change) or, at best, misleading because it conceals the fact that it is a distinctive type of quality

[5] These changes are not spatial processes (*phorai*) or changes in quantity either: the other possible candidates. (See for a list of the relevant standard types of process: *Physics* H.1, 243a35ff.)

[6] In this translation I take '*theorizer*' to refer to the state of the one who knows in the authoritative way (*epistamenos kuriōs*: 417a29), 'to itself' to refer to being a knower in this way, and '*entelecheia*' to the state such a knower is in. The transition to this state (*epidosis*) consists in actively using one's knowledge. Hicks, it should be noted, achieves a broadly similar understanding of 417b5–6 although translating it somewhat differently: 'for that which has knowledge becomes an actual knower by *theorizing* which is an advance towards the thing itself'. In the case of knowledge, the transition to being a knower may also be a transition to the nature of the subject in question (if the subject is defined as a knower). But this may be a special feature of the example of knowledge, not a general requirement on all [Type 2] changes.

change, different from standard [Type 1] changes. He does not seem concerned to decide at this point which of these alternative ways of labelling [Type 2A] changes is to be preferred: his goal is only to distinguish them from [Type 1] changes.

Aristotle had discussed both sorts of [Type 2] change in the immediately preceding passage (417a20–b2), distinguishing the person who uses knowledge already possessed (417a29–30) from one who learns (417a31–2) and has, as a result of learning, 'been altered in quality, often changing from a contrary state'. In the latter case, the learner acquires a new state (*hexis*): being possessed of knowledge which they are capable of exercising there and then. Their being in that state, being a knower capable of exercising their knowledge, is the relevant achievement. Their state is not itself a capacity: it is the way they are when they are capable of certain activities. Being capable of speaking French is not itself a capacity.[7] In the former case, by contrast, the final achievement is described as that of being an active speaker of French: the state a person is in when they are exercising the knowledge they possess.[8] Both could be described as changes 'towards' the actuality (*entelecheia*) in question: in one case this would be to the state of being able to speak French, in the other to actually speaking French.

In the passage just cited (417b2–6), Aristotle distinguishes both cases of [Type 2] change from all [Type 1] changes. Later he confirms that [2B] and [2A] cases all differ from [Type 1] changes ('as was remarked', in effect, at the outset).[9] What is the basis for his distinction? One suggestion runs as follows:

[7] This point is important for a question raised at the end of Chapter 2: are enmattered forms capacities or actualities? It seems that, in this discussion, forms should be identified not with capacities but with the actual states in which their possessor is capable of acting: their being such as to be capable of acting. This is the way they are: their way of being. (For further discussion: see Chapter 7, Section 6.)

[8] In 417a22–b2, Aristotle focuses on distinguishing different ways of being a knower: being an actual and potential (in various ways) knower. He is separating different states one may be in, not classifying different processes or activities. In 417b2–16, by contrast, he is discussing processes (sufferings) of various types. Since states are not processes, Aristotle is not identifying the state of being a master of French with learning French or the state of being a currently active French speaker with currently speaking French. One will, of course, become a master of French by learning French and a currently active French speaker by (in virtue of) speaking French. But, nonetheless, it is a mistake to identify any of the states mentioned in 417a22–b2 with the various types of processes (sufferings: described after 417b2) which are required for those states to be present. Nor is there any sign that Aristotle, with his customary attention to the relevant ontology, made it. There is no reason to interpret him as identifying the state of one who has mastered a skill (417a25: the knower) with their learning that skill (being led: 417b10ff.). Nor should one identify people coming to be in the state of being an active speaker of French (in virtue of their speaking French) with their transitioning to speaking French (from silence) by beginning to speak (as Burnyeat suggested). They come to be in the state of being an active French speaker by speaking French. At this point, I follow Mary Louise Gill (1989: 179) and Robert Heinaman (2007: 176) in taking using knowledge (or theorizing), not the transition to using knowledge, to be what is said 'not to be a quality change or to be a different type of quality change' (417b5–7).

[9] 'As was said' should, if possible, be retained from the majority of the MSS [CPV]. Its presence implies that the acquisition of knowledge has been said earlier (in effect) not to be a simple case of being affected in 417b3–7. This implication can be accepted if (as I argue) the acquisition of knowledge (learning) is a case of 'the preservation of what something is potentially (a knower) . . . under the causal influence of what is actually so and so . . .'. Its omission in some later MSS [S,U] may be explained by their rejection of this view of learning, perhaps influenced by Simplicius' or Philoponus'

[Type 1] changes are those for which it is essential that a contrary is destroyed by a contrary.

In the case of cooling, for example, it is required that when hot water is cooled its heat is destroyed by something cool. The water needs to lose some of its original heat for this change to occur. Cooling, so understood, meets two conditions:

(a) There is a 'type of destruction' of the water's heat in the process of change (417b2–3). Indeed, it is essential that the water's initial heat is destroyed, and the water ceases to be hot. This is because the change in question is defined as one in which one specified contrary state is destroyed.[10]
(b) The change is brought about by a causal agent which is itself cold: possessed of the contrary of the water which was initially hot.[11]

[Type 2] changes do not satisfy the first condition. It is not essential to these changes that the initial condition be destroyed in the change. On the contrary, the subject has to retain that condition throughout, going from being potentially a knower to being one in activity. More precisely: this potentiality (or capacity) is preserved and the change is in the direction of (*epi*) its appropriate end point (or goal): being an active knower. In [Type 2B] cases this transition culminates in the learner's acquiring the ability to speak French (417b16: a state or *hexis*), in [Type 2A] cases in their actually speaking French: being a knower in the fullest sense (417a29). The latter cases, in which the knower develops into being what it is (*epidosis eis auto*: 417b7), can be described as changes in the direction of its nature (*phusis*: 417b16). [Type 2B] transitions, in the case of learning, can also be described as changes in the direction of the nature of the object in question, even though they result in a state of knowledge (*hexis*) not in the activity that defines its nature: the one in which it is truly what it is—a knower. The whole change from its outset in initial learning to its final realization in speaking French is a [Type 2] change (417b16). Its first stage is a [Type 2B] change, its second a [Type 2A] change.

commentaries. I am indebted to Andreas Anagnostopoulos for helpful discussion of this textual issue and many other problems in *De Anima* B.5. For an alternative view of the text, see Lorenz (2007: n. 11).

[10] I take 'negative conditions' (*sterētikas diatheseis*: 417b15) to refer to this case. (Compare the use of similar terminology in discussing the hot and the cold in *Meta.* 1070b11ff.) In these cases, it is essential that the final condition is not the original one: the object is no longer cold. This will be so even if it is not hot. Aristotle's description of a case of the destruction of the cold by the hot is accurate: all that is required for the change described in 417b2–3 is that the object ceases to be cold not that it becomes hot. On this point, I agree with Burnyeat (2002) and Heinaman (2007) and disagree with John Bowin (2012b).

[11] I take the phrase 'by what is contrary' to refer to the causal agent of change: compare the role of the teacher in [Type 2] changes. There is no reason to take all [Type 1] changes as unnatural. On this point, I agree with Bowin (2011: 149).

All [Type 2] changes, so understood, fail to meet condition (a) for being a [Type 1] change. This is because:

[Type 1] changes are ones in which it is essential that the original state (e.g. being hot) is destroyed and replaced by a different, incompatible, condition (not being hot) in the change. These are defined as a transition from one contrary in the direction of another. The initial state, e.g. being hot, is one which has to be lost or negated in the course of the change, if it is to be the very change it is.

[Type 2] changes, by contrast, are ones in which the subject, so far from losing one contrary state to gain another, retains its initial condition (being potentially a knower) and is brought closer to the potentiality's goal: being an active knower) in the course of the change. These are not essentially changes from one contrary, because the initial state is not defined as one which is a contrary, to the final state: being an active knower. Instead, it is defined as the state of a (potential) knower, one who has the capacity to become an active knower at the end of the transition.

Aristotle's distinction, so understood, will classify learning as a [Type 2B] change. However, earlier in 417a30–1, he had written:

> The learner has been changed in quality through learning, often changing from the opposite state (*hexis*).

Doesn't this show that learning is, after all, a [Type 1] change: one which always is a change in quality from one state (being ignorant) to its contrary (knowledge), not a [Type 2] change? Have we misunderstood Aristotle's distinction? Or perhaps it was badly drawn.

It is important to note, at the outset, that:

1. Aristotle may best be understood as saying that learning is *often* from the contrary state, not that it *always* is.[12] If so, he is not claiming that it is *required* for learning that one begins from, for example, a state of ignorance. Learning (the type), so understood, will not meet condition (a) for [Type 1] changes. Although he does not develop this remark further, it suggests that one can, in his view, begin learning at a variety of starting points, not simply from the contrary state: ignorance. One might, for instance, begin from

[12] As Hicks correctly translates. Aristotle surely did not require, as the alternative translation favoured by Ross suggests, that all cases of learning require *frequent* changes from the contrary state: ignorance. One does not have to go back to square one each time one strives to master French! There are interim starting points in that journey. (Nor is it clear that Aristotle thought that all the intervening stages could be located on a single line between two contraries: ignorance and knowledge. There are, it seems, many ways of failing to know.)

true beliefs. While all learning begins from lack of knowledge (a *deprivation* in Aristotle's term), not all need begin from a contrary state.[13]

2. Even if cases of learning do begin with the learner being in a (contrary) state, what is essential to their being cases of learning is that the subjects of change retain their potential to be a knower throughout. It is in virtue of the presence of this potentiality that they change in the required way and achieve the final state (being a theorizer). Learning does not occur in virtue of the subject's being ignorant. It is their capacity to know that is essential to this change. After all, some subjects are ignorant in ways that preclude them from ever learning (as dogs cannot learn to speak French). Instead, it is because pupils are capable of knowing, not because they are ignorant, that the teacher can teach them. This is why learning is defined as a change in which the original capacity, essential to the change, is preserved throughout.[14]

It is natural to object that in any particular case, the learner must begin in one definite epistemic condition (whether this be that of ignorance or of mistaken or incomplete belief) and end with the acquisition of knowledge. Isn't this enough, it will be said, to make their learning a [Type 1] change, in which one quality is lost and another gained? Isn't their lack of knowledge destroyed and replaced by a new state of knowledge? Doesn't this show that learning cannot be a [Type 2B] change?

This objection too can be met: even if each [Type 2B] change does in fact involve a change from some definite epistemic condition to one of knowledge, what is *essential* to that (very) change is its occurring in virtue of the learner's capacity to know, which is fully realized in their active knowledge. As such, it is essentially a [2B] change which, as it happens, begins at one definite epistemic state. Further, for all that is said, while beginning in that definite epistemic condition may be an accidental description of the particular [Type 2B] change that occurs, it need not be the essential description of a further [Type 1] change. Indeed, there

[13] For this distinction, see, for example, *Metaphysics* 1055b14–15 where deprivations (*sterēseis*) are contrasted with contraries. Not all deprivations are contraries. What unifies all cases of learning is that they are from some lack of knowledge, not that they are from a contrary state such as ignorance. In fact, in Aristotle's view, there is no separate potential to be ignorant. (For similar restrictions on capacities, see *Metaphysics* 1051a15f.) If so, learning cannot be essentially the destruction of this state (compare 417b2–3). Nor, one might add, is the acquisition of knowledge (strictly speaking) a change to the privative state (417b15) because ignorance is not a positively characterized state and so lacks a privation. (Knowledge, that is, is not to be understood as the privation of the privation!)

[14] This is not simply to say, as Burnyeat suggests (2002: 61–7), that learning is from one point of view a [Type 1], from another a [Type 2] change. My suggestion is that learning, of the type envisaged here, is essentially a [Type 2] change, as too is using knowledge one already has. Both are essentially cases of preservative changes in which the subject comes towards 'themselves and the relevant actuality' (417b7–8): they are both in the direction of one's nature as a knower (417b16–17). Indeed, both cases of [Type 2] changes can, as Heinaman correctly notes (2007: 170ff.), be seen 'from one point of view' as [Type 1] changes: this is because [Type 2A] changes can also be described as changes from the state of not using to that of using knowledge.

need be no such [Type 1] change which is required for, let alone essential to, the activity of learning.[15] Since there is no explicit mention of any additional [Type 1] change 'in the offing' in this passage, all that seems to be required is that there be just one [Type 2B] change which, as it happens, begins with the subject being ignorant.[16]

There is a further difficulty. Some might suggest that any [Type 1] change (such as turning cold) can be re-described as a [Type 2] change. Cooling, that is, might be defined as the realization of the capacity of the object to be cold.[17] This change, so understood, will occur in virtue of that object's ability to be cold. Further, that ability will continue to be present throughout the process as a result of which the object ends up cold. However, if this is the way to understand this change, Aristotle's distinction, as we have characterized it, will collapse. [Type 1] changes will all be, in the final analysis, [Type 2] changes.

This difficulty too can be overcome. In the case of cooling, the original contrary (the heat of the object) has to be destroyed in the course of the change. This is because this type of process is defined as a transition from one contrary state in the direction of the other.[18] In these changes, so defined, the object is deprived of the very condition (being hot) which was essential for the change being a case of cooling. While the water, even when hot at the beginning of the process, may retain its potential to be cold (because it can become cold again in certain conditions: 1048a16ff.),[19] what is essential for this very change is that the potential to be cold does not determine the state of the object at the time when the transition began. Had it done so, the object would have been cool at the outset and cooling could not have occurred. Given the nature of this change, the potential to be cold, the potential that is exercised at the end of the process, cannot determine the state of the object at the outset: that state in virtue of which cooling occurs. The initial condition, essential to this change, has to be determined by its capacity to be hot. It is in virtue of its being hot at the outset that cooling occurs.

In [Type 2] cases, by contrast, the relevant initial state, as in the case of learning, is not defined as one which is a contrary to the final state: being an active knower. Indeed, its initial state is best understood as the state of a (potential) knower, one who has the capacity to become an active knower at the end of the transition.

[15] This will be true even if all cases of [Type 2] changes have accidental descriptions of this kind.

[16] In this case, the 'whence and the whither' will not determine the form in question. Contrast what happens in standard cases of processes (*kinēseis*): *N.E.* 1174a31ff. For further discussion of the case of knowledge, see *Physics* H (VII).3, discussed in Section 4.8.

[17] There is a major debate as to whether cooling is, for Aristotle, to be defined as the realization of the capacity to be cool or the capacity to be cooled. However, in the present context, I shall accept (for the sake of argument) the first alternative, although favouring the second for the reasons given in 'Aristotle's Processes' (2015: 186–205).

[18] See, for example, *Physics* 205a6, 224b29, and *De Generatione et Corruptione* 310a25.

[19] At this point, I follow the analysis of conditional capacities (unconditionally ascribed) developed by David Pears (1975) and accepted by Jonathan Beere (2009).

The subject is not deprived of this initial state (being capable of knowing) as the change occurs. Instead, the end state is the realization of the very capacity (to be a knower) whose presence determined the relevant initial state of the subject, the one required for this to be the change it is. It is in virtue of the subject being capable of knowing, and not in virtue of any capacity to be ignorant, that the change in question occurs. Even if there were (contrary to Aristotle's view) a capacity to be ignorant, it would not be in virtue of its presence that the change occurs. Nor would this capacity determine the state of the subject in virtue of which the relevant change occurs. (Remember those who are ignorant in such a way as to be incapable of the relevant knowledge!)

This is why what happens in all [Type 2] cases is to be defined as a transition towards the goal of the relevant capacity: 417b4–5. The end stage in all such cases is the realization of the capacity to know which was present and active (albeit in an incomplete way) at (and even before) the beginning of the change. This first realization of this capacity consists in the learner's achieving the state of being a knower (being a master of French: *hexis* (417b16)), the second in the activity which follows from that state (speaking French) or in the state of being active as a French speaker. When actively speaking French, one will be in the state earlier described as that of being 'a knower in the full sense': 417a28.[20]

What is the importance, from Aristotle's viewpoint, of this distinction? The capacities involved in [Type 2] changes are, in the cases with which Aristotle is principally concerned, ones which are defined by their role in a completed well-functioning organism: such as seeing or actively knowing (*De Anima* Γ.7, 431a5–7), which he describes as 'activities (*energeiai*) without qualification'.[21] This is the goal of the relevant capacity: one which is active and present from the outset up until the acquisition of the settled state (*hexis*) and its exercise. [Type 2] changes are essentially the realizations of goal-directed capacities of see-ers or knowers. They are, as such, defined in terms of their teleological role in the organism in question.

The capacities involved in heating and cooling, by contrast, are defined as the realization of a capacity of an object to be affected by other objects. They

[20] If this is correct, there is no need to invoke the distinction, suggested by Heinaman (2007: 175–7), between those uses of knowledge which are and those which are not 'nature-preserving'. Indeed, we should be reluctant to introduce this distinction in a context in which Aristotle focuses only on successful, 'nature preserving', cases: his examples are of use of skills (417a31) and of theorizing (a success term: 417b5). These are not cases where one merely actively thinks one knows. One actively knows.

[21] It does not follow from this that all [Type 2] changes must be directed towards the natural goals of the organism. There can be, for all that is said here, other [Type 2] changes where the capacity realized is, for example, one for vice or vicious activity, not for a natural goal of the organism. Indeed, if all completions are [Type 2] changes, Aristotle will point to just such a case in *Physics* 246b18–20, where he treats both virtues and vices alike as 'completions' of the relevant capacities. There is no reason, *pace* Bowin (2011: 151–2), why [Type 2] changes, as defined in *De Anima* B.5, should exclude the realizations of capacities for vice, illness, or blindness, even if the examples mentioned in *De Anima* are not of this type. It is simply that there he focuses on knowing and perceiving which are directed towards the natural goals of the organism.

are not defined by their role in producing the natural goals of a completed, well-functioning, organism. Even if water has a natural temperature, its being cooled by another cool object will not be defined in terms of coming to be in that natural state: it could, after all, be cooled to temperatures below or above it, depending on the nature of the external cause and circumstances. This is why [Type 1] changes can be described as the activity (*energeia*) of what is incomplete (*De Anima* Γ.7, 431a6–7), best understood as what has the capacity to be cooled or heated.[22] They do not realize the distinctive type of goal-directed capacity, defined by reference to the activity of the completed organism, which is manifested in the [Type 2] changes with which Aristotle is concerned in *De Anima*. In the latter cases, a capacity of this type was, and had to be, present and active (albeit in an incomplete way) at the outset.

Perceiving and knowing are [Type 2] changes, defined by reference to their teleological role in the completed organism. In *De Anima* B.5, Aristotle has, in effect, refined the ontology introduced in *De Anima* A.1 by distinguishing [Type 1] and [Type 2] changes. Once this distinction is drawn, desiring too should be classified as a [Type 2] change: one defined as the realization of a capacity with a role in the completed organism: it is, as Aristotle notes in *De Anima* Γ.7, to be defined as an activity towards what is good or bad for the organism (431a10–11).

Aristotle develops his account in *De Anima* B.5 by suggesting that perception, understood as the exercise of the perceptual capacity, and thinking are both [Type 2A] changes (417b16–19) despite their other differences.[23] While there may be prior [Type 2B] changes, akin to learning, in which the child (or embryo) acquires the capacity to perceive red objects, the capacity exercised in seeing particular red objects is compared with using knowledge one already has. (For a similar claim, see *De Sensu* 441b20ff.)

Why did Aristotle think of perceiving this red object as a [Type 2A] change? Isn't it really a [Type 2B] change, from lack of knowledge to knowledge of the object's colour? Don't we learn its colour in this case?

While Aristotle did not tackle this problem directly in *De Anima* B.5, he provides the resources to do so. We possess at birth, in his account, the capacity to see any red object that is presented to us (with no antecedent learning) because we are born with (e.g.) a capacity to detect all such qualities when encountered. The capacity in virtue of which we see this red object, so understood, is a general

[22] I defended this specific view in my 'Aristotle's Processes' (2015: 186–205) and earlier in *Aristotle's Philosophy of Action* (1984: 19ff.). For an alternative interpretation, see Aryeh Kosman's discussion (2013: 50–5), building on his earlier work (1969: 41–62) and Ursula Coope's essay (2009: 277–91). The issue is also discussed by Jonathan Beere (2009: 204ff.) and Andreas Anagnostopoulos (2010: 33–79). There is no need, in interpreting 431a5–7, to attempt to adjudicate further between these suggestions. All can, albeit in somewhat differing ways, make room for the required distinction between those changes which are definitionally connected with a completed goal and those which are not.

[23] They differ in that the objects of perception are external particulars, the objects of thought universals already in some way in the soul (417b19–27).

one: to see red objects. No further capacity (to see *this* red object) is acquired or exercised when I see this red object. The capacity exercised on this occasion is to be individuated in terms of its general role in the organism. Although we learn something new when seeing this particular red object, we do not acquire a new capacity in doing so. It is not the type of learning (acquisition of a new capacity) required for a [Type 2B] change. Perhaps this is why perceiving is classified as a [Type 2A] change.[24]

Aristotle's discussion in *De Anima* B.5 serves to clarify several points about the ontology of perceiving:

(i) Perceiving is not a [Type 1] but a [Type 2] change: it is not a change (like ordinary colouring) in which red is replaced by green (or its relevant opposite);
(ii) It is the exercise of an already acquired goal-directed capacity: it is not a [Type 2B] change (like learning) but a [Type 2A] change
(iii) The sense organ is not itself altered in the way objects affected by [Type 1] changes are affected
(iv) The sense organ is not itself altered in the way objects affected by [Type 2B] changes are affected.

Perceiving, so understood, is neither a [Type 1] nor a [Type 2B] change, one in which the relevant state (*hexis*) is set up. Instead, it is the exercise of a capacity one already has, where the exercise need not involve either the replacement of one contrary by another or the setting up of a positive state (*hexis*). In this type of change, the relevant capacity (of the sense organ) is exercised in perceiving. It is not a case of replacing one contrary by another: a [Type 1] change. The transition from being a potential seer to an actual seer is seeing. This is a case of a [Type 2A] change in which the perceiver is (in some way) made like, or likened to, the object perceived (417a20, 417b5–6). The way in question remains to be spelled out.

Aristotle, in this discussion, draws distinctions not captured by undifferentiated talk of events. He is at pains to distinguish [Type 1] and [Type 2] and to show their differing structures. These ontological issues will be important in our subsequent discussion of other aspects of Aristotle's account of the psychology of complete organisms.

[24] An interesting alternative, suggested in discussion by Mary Louise Gill, runs as follows: one comes to possess the capacity to see what is red at that stage when one has acquired (as a maturing child) the capacity to discriminate red objects from those which are like red ones (moving to a determinate grasp on red). In *Physics* 184b2–3, A describes a child who calls any man 'father'. Perhaps there is a stage at which the child calls all non-blue or green objects red. In this understanding, the acquisition of the capacity to see what is red will depend on prior cases of seeing.

4.4 Perceiving: a 'mere Cambridge change'?

There is no commitment in *De Anima* B.5, as understood in Section 4.3, to treating perceiving, or [Type 2] essentially goal-directed changes more generally, as 'mere Cambridge changes', changes in relation alone. There are two ways to see this.

Elsewhere, in *Physics* H (VII). 3, Aristotle discusses phenomena described as 'completions' (*epiteleiōseis*). These changes (such as the house being tiled or roofed: 246a19) are not quality changes (strictly speaking) because they are not defined as changes from one contrary to another.[25] Instead, they are essentially the completions (or perfections) of what something potentially is (and, as such, is described paradigmatically as in line with its nature: 246a15).[26] In the case of roofing, the completion might be the realization of the tiles' capacity to be the roof of a house and will occur as (and when) it does in virtue of their possession of that capacity. While the final stage in house-building, that of putting on the roof, is not a [Type 1] change (as it is not the replacement of one contrary by another), it is nonetheless a matter-involving change: a [Type 2] change essentially involving tiles, bricks, and their material capacities (to bear weight etc.) and, as such (in line with the argument developed in Chapter 2, Section 6), the realization of a goal-directed but inextricably material capacity.[27] Further, since tiling and roofing are not mere Cambridge changes, Aristotle is focusing on phenomena which are neither [Type 1] changes nor mere Cambridge changes.

Aristotle in H.3 claims that neither states of the soul or the body nor their acquisition are quality changes, or at least those which are virtues or vices. Virtues and their acquisition are both described as 'completions' (246a10–11, 13). Virtues are so described because they are the best, or perfect (*teleion*), state of the subject in question (246a14–15), understood as the goal of one of its natural capacities. It

[25] In the case of completions, there is no transition from one contrary to another, as there is in ordinary quality changes (including those involving heat: 245b15), because there are no contraries to completions (as *not being complete* is not the contrary of being complete/being in a given relation). Ordinary quality changes, by contrast, are from one contrary to another (*Physics* E. (V), 1, 225b10ff.). In the case of house building, the transition from not having a roof to having a roof is not an alteration (246a20f.) because not having a roof is not the contrary of having a roof. (There are after all many ways of not having a roof!)

[26] At this point, I follow Ursula Coope's interpretation of what is distinctive about completions: they are the manifestations of the nature of the things whose manifestations they are (2012: 69ff.). I follow the MSS (against Ross) in maintaining '*to*' (246a15) and in taking Aristotle to be speaking about the expression 'in accordance with nature'.

[27] It is important to note that while *Physics* H (VII). 3 marks off [Type 2] changes from [Type I] alterations, it introduces a distinction not to be found in Aristotle's discussion of processes in *Physics* Γ(III) 1–3), where teaching and learning are paradigm cases of alterations: in *Physics* H.3, by contrast, they are not taken as alterations at all (perhaps because they are not, in the required way, between contraries). While *De Anima* B.5 marks off [Type 2] cases in a manner which resembles (in some respects) that employed in *Physics* H.3 to characterize completions as non-alterations, it does not follow *Physics* H.3 in denying them the status of quality change. That question is left open (417b14f).

may be that, in referring to the state in question, Aristotle intends to extend this description to the exercise of that state in virtuous activity. He certainly envisages such an extension later in the chapter in considering the states of the intellect (247b1–3); there he writes, in similar terms, of their *coming to be used* as a completion, not a quality change (247b10–13). The acquisition of knowledge and its coming to be used are both instances of perfecting the capacity of the subject to know. If so, both [Type 2] changes, the acquisition of knowledge and its subsequent exercise, will be regarded in H.3 as 'completions' because both are perfections of a capacity already possessed (such as the capacity to know or be virtuous). They are, as in *De Anima* B.5, the progressive manifestation of the subject's goal-directed capacity. (I shall return to another aspect of the *Physics* H.3 discussion of knowledge below.)

Aristotle's remarks provide the resources to defuse an important argument in favour of the spiritualist interpretation, advanced by Myles Burnyeat. He presented Aristotle as holding:

1. All alteration is a change with regard to quality [premise]
2. All changes with regard to quality are [Type 1] changes [premise]
3. No [Type 2] change is a [Type 1] change [premise]
4. No [Type 2] change is a change with regard to quality (from 2 and 3)

and so as concluding that:

5. No [Type 2] change is an alteration (from 4 and 1), and that
6. All [Type 2] changes are 'mere Cambridge' changes (from 5).

However, if completions (such as completing the house by putting the roof on) are neither mere Cambridge changes nor [Type 1] changes, Aristotle can, and should, reject premise (2). There are also completions, specifically quality-related matter-involving goal-directed completions, to consider.[28]

In the immediate context of *De Anima* B, Aristotle gives an example of just such a matter-involving completion. In his account of nutrition, he initially distinguishes two stages:

[Stage A]: food (undigested) is taken into the body: as Aristotle describes it 'contrary feeds on contrary' (416b7ff.)

[28] Burnyeat is reluctant to countenance use of *Physics* H (VII).3 in discussing *De Anima* B.5 because he regards it as an outlier text, offering a view inconsistent with his own 'mere Cambridge change' interpretation of the relevant *De Anima* passages (2002: 28–90). It is, in my view, a merit of my interpretation of *De Anima* B.5 that it coheres well with Aristotle's discussion, in somewhat similar terms, of apparently similar phenomena in *Physics* H.

[Stage B]: food (digested) is used by the body: like by like (in Aristotle's terminology) (416b7–8).

At [Stage B]:

(a) there is no destruction of the first contrary (as the nutriment at this stage retains its nature and does not change into a contrary: 416b6–7);
(b) the nutriment goes from being a potential energizer of the ensouled body to being its actual energizer: 416b16–20;
(c) As a result of (a) and (b), the nutriment preserves the ensouled body in activity.

At [Stage B], the relevant *capacity* of the nutritive soul converts what is a potential energizer of an ensouled body into an actual energizer of that body. The nutriment itself goes from being a potential to an actual energizer of the ensouled body. This is the way the nutriment preserves the ensouled body in activity. It maintains the qualities of the body. However, this is not a [Type 1] change from one contrary to another because, as in *De Anima* B.5, there are no contraries to completions of what something potentially is (in line with its nature). However, as in the case of tiling or putting the roof on, nutrition (at [Stage B]) is an essentially matter-involving type of change, although not a [Type 1] change. It is a [Type 2] change, because it essentially involves as its object, food, a distinctive type of material composite (*De Sensu* 445a20–1) and its sweetness (*De Sensu* 441b27ff.).[29] This change will be, if the argument developed in Chapter 2 is correct, *the* realization of a goal-directed inextricably material capacity.

Perception and nutrition at [Stage B] are similar in several respects: in both

[1] the object perceived/nutriment does not change into a contrary condition in being perceived/being used as nutriment;

[2] the action of the object perceived/nutriment is to preserve (not to alter) the perceptual faculty/the *ensouled* body.

Given these points of similarity, one should conclude that:

[3] Neither nutrition at [Stage B] nor perception is a [Type 1] change (from contrary to contrary).

Both are better classified as completions (*epiteleiōseis*), if the latter are understood as the perfections of a capacity that is already present. Since nutrition is a

[29] For further discussion of these aspects of nutrition, see Thomas Johansen's account (2012: 136–7).

matter-involving completion, the realization of an inextricably material capacity, and not a 'mere Cambridge change', perception may also be a completion of this type. It does not follow from its not being a [Type 1] change that it is a 'mere Cambridge change'.

4.5 Perceiving: the issue

We can now, in the light of the discussion in Sections 4.3 and 4.4, formulate two questions which are central for our present investigation:

(a) Is perception, like nutrition, a type of matter-involving completion (like finishing the house by tiling the roof)? Or is it a 'mere Cambridge change'?
(b) If perceiving itself is a [Type 2A] change, is this the only change essentially involved in perception (as may be the case in coming to know)? Or is there also an additional [Type 1] change in which the sense organ is caused to be a given way and a further [Type 2] change in which the perceiver sees the object or property in question? And, if there are two changes of this type, how exactly are they related?[30]

Spiritualist interpreters deny that perceiving is, for Aristotle, itself defined as a matter-involving completion. They present it simply as a type of awareness, or discrimination, of the object perceived. Some deny that any [Type 1] material change occurs in cases of perceptual awareness. Others, like Burnyeat in his later essays, accepted that some bodily changes (or conditions) are causally necessary for an occurrence of this type of awareness.[31] However, they all deny that such material changes or conditions are referred to as part of the definition of the type of awareness at issue. Even for later spiritualists, no [Type 1] change is an essential feature (or definitional part) of perceptual awareness (which they see as the relevant formal change). Any [Type 1] change that occurs is, in their view, distinct from the purely psychological [Type 2] activity of awareness (or discrimination) which is perceiving.

Non-reductionist materialist interpreters have much in common with the later spiritualists. They too think that there are two changes in Aristotle' account of perception: a [Type 1] change and a second [Type 2] change. They also agree that the initial [Type 1] change is a material change. They differ from spiritualists in

[30] This view is adopted, albeit in somewhat different forms, by Victor Caston (2005), Hendrik Lorenz (2007), Mark Johnstone (2012), and Thomas Johansen (2012).

[31] Burnyeat (2001: 136). He writes:

> Moistening is a necessary part of the total process, whether as causal antecedents (sound or smell) or concomitant effects. They are not constitutive of perceiving as such. (2001: 136)

understanding the relevant [Type 2] change as not merely a causally necessary feature, required for the occurrence of the relevant perception. It is, in their view, an essential additional part of perceiving, now understood as a complex phenomenon defined in terms of two definitionally separate component types: an activity of awareness and the material change that underlies it.

There are, it should be noted, several materialist interpretations. In non-reductionist accounts, [Type 2] changes are defined as the type of changes they are independently of the [Type 1] changes that realize them. In this view, perception cannot be reduced to, or defined in terms of, an underlying [Type 1] material change. Instead, it is a combination (of some kind) of a purely psychological phenomenon (awareness of the object) and a purely physical phenomenon. While they (like spiritualists) agree that perceiving contains a purely psychological type of activity defined without reference to any internal, grounding, material change, they differ in taking this physical component to be essential for perception, defined as a combination of a purely physical and a purely psychological activity, where the former (in some way) grounds the latter.[32] Other materialist interpreters take a different view, presenting Aristotle as aiming to reduce the psychological to the physical by advocating a version of type-identity theory.[33] Still others seek to define the psychological properties neutrally in terms of their causal role alone (without essential reference to them as psychological).

These materialist and spiritualist interpretations, however, do not exhaust the range of answers offered to questions (a) and (b) (even if one excludes dualist readings). Others, while accepting that there are two changes and seeing one as purely psychological, take Aristotle to define the material change in terms of the psychological one: as, for example, the one required for the purely psychological activity of perceiving. This latter view, sometimes attributed to Aquinas, combines a pure psychological component with an impure physical component, defined in terms which explicitly refer to the psychological. One might call the physical component, which Aquinas described as 'spiritual matter', quasi-material. Others suggest that Aristotle himself did not commit himself to a view about the relation between the relevant purely psychological [Type 2] change and the material [Type 1] change, preferring to remain neutral between the options just sketched.[34]

All the options just canvassed (excluding the reductionist materialist and neutral functionalist accounts) agree on one central claim: there is a definitionally

[32] Caston, Shields, and Johansen take this view, albeit in somewhat different forms. Some of the differences between them are helpfully set out by Caston (2005) and Johansen (2012*)*. Earlier writers who held this type of account include Martha Nussbaum (1978), Richard Sorabji (1979), and my younger self (1984).

[33] As suggested by T.J. Slakey (1961: 470–84).

[34] There are several ways to develop this possibility. Perhaps Aristotle took no view as to whether or not the co-occurring physical process was essential for perception. Or perhaps he thought that it was essential but took (or stated) no view as to whether it realized or grounded the purely psychological activity of awareness. (For the latter view, see Lorenz: 2007: 179–220.)

independent, purely psychological feature or activity, involved in perception. The form of this feature or activity is pure: not defined in terms which explicitly refer to specific internal material states. It is this shared assumption that I wish to challenge.

The relevant psychological activity, such as discrimination or awareness of a red object, is, I shall suggest, defined as an inextricably psycho-physical activity. To discriminate such an object is to be materially affected in such a way that we are perceptually aware of its redness. Perceiving, so understood, is a [Type 2] change: an essentially matter-involving completion, the realization of an inextricably material capacity. There is not a definitionally independent, purely psychological, [Type 2] change (discrimination or awareness) that occurs. The type of perceptual awareness itself, and the relevant capacity for such awareness, is defined as inextricably psycho-physical, not decomposable into two definitionally separate components, one of which is purely psychological.

If Aristotle were to understand perceiving in this way, his account would run as follows: when perceiving red, perceivers, possessed of the general ability to see something red, are causally affected by redness in the world. Before they are affected in this way, their state will be one in which they have the potential to see red—a state which is not the contrary of seeing what is red.[35] Although their perceiving red is not a [Type 1] change from one contrary to another, as Aristotle notes: *De Anima* B.5, 417a8ff., it will not be defined as a purely psychological activity (or a distinct purely psychological part of one). Instead, it will be an inextricably psycho-physical completion, a [Type 2] change. Individual activities of perceiving red will be essentially instances of this type.

The case of nutrition [at Stage B] provides an analogy. Those capable of being fed do not move to a contrary state when fed. There is no contrary essentially destroyed in this transition.[36] What occurs involves nutriment travelling around the body and affecting different parts as it goes. These essentially material movements are defined as integral parts of the [Type 2] change under way at [Stage B] of nutrition. They should not be defined as [Type 1] changes co-occurring with a [Type 2] change of nutrition. Instead, they are stages in a process of nutrition governed by its characteristic goal in a completed organism. As such, they are essentially stages of a [Type 2] change, not a definitionally distinct [Type 1] change which co-occurs with a [Type 2] change.

Is this correct? Are tasting and smelling essentially and inextricably psycho-physical completions, [Type 2] changes? If they are, Aristotle's account will not be captured by either non-reductionist materialist or spiritualist interpretations.

[35] We are still at the logical level of analysis prior to introduction of talk of the 'transparent'. There are many states in which one is not seeing what is red (but seeing what is green, blue, or yellow) but has the potential to do so.

[36] Perhaps, one might add (in the style of *Phys.* H.3), in desiring revenge they stand in a relation to a possible future state of affairs (and relations lack contraries).

This is because he is not advocating any of the positions just canvassed because he rejects the two post-Cartesian assumptions [A] and [B] which, as we noted in Section 4.1, encourage philosophers to accept one of these options. I shall further suggest that, in his view, there is no purely physical process which underlies it. All that is essential to tasting is an inextricably psycho-physical discrimination or awareness of the flavour of objects in the world.

4.6 Tasting: an inextricably psycho-physical completion

In *De Anima* A.1, Aristotle, as we noted in Chapter 1, offered two types of consideration to support his suggestion that anger is best defined as the boiling-of-the-blood type of desire for revenge brought on in a given way. His discussion of taste contains the first of these (what I shall call) [H.1]-type considerations:

(1) If the sense organ is destroyed, there is no tasting at all. Some types of perceptual impact are described as being too strong for the sense organ to bear and destroying the relevant 'formula' (*logos*) of the body in the same ways as some heavy blows might break a musical instrument. When this happens, the animal with the damaged sense organ can no longer perceive (424a28–32). It is necessary for perception that a (basically) undamaged sense organ is present (where such an organ is a bodily magnitude: 424a26–7). If there is no such appropriate bodily organ present, there will be no suffering for the relevant objects of sense (424a32ff.).

(2) The sense organ, if tasting is to occur, has not only to be present undamaged; it also has to be in a given bodily condition. In discussing taste, Aristotle suggests that the tongue, if it is to taste flavours, must be neither too wet nor too dry but capable of being moistened by the flavour in question (422b5ff.). It must have the right degree of moisture to be affected by the flavours in question. These remarks show that, in Aristotle's view, there has to be an appropriately moist bodily organ present if it is to taste flavours.

The sense organ, in the light of (1) and (2), responds—if it is an appropriate condition—to the flavour in the way (whatever it is) required to taste it. This response is the actualization of a capacity of the patient to taste. How is this activity to be understood? What is involved in its responding to the flavours that affect it?

[H.1] considerations are consistent with some versions of spiritualism. For later spiritualists, the tongue's being initially dry and being capable of being moistened is a causally necessary condition for tasting to occur. In their view, the physical impact of moistening is a concomitant (or at best a causally necessary) physical occurrence, not constitutive of the sensing itself. It does not make the awareness be the way it is. [H.1] considerations, as they stand, are consistent with both late spiritualist and non-reductionist interpretations.

However, in his discussion of taste, Aristotle introduced further, [H.2]-style, considerations which suggest a different conclusion. Thus, he writes:

> Since the object of taste is moist, it is necessary that its sense organ be neither actually moist nor yet incapable of being made moist. For taste is acted upon by the object of taste as such. The organ of taste which needs to be moistened must have the capacity of absorbing moisture without being dissolved, while at the same time not actually being moist. Evidence for this: the tongue cannot perceive when very dry or very wet. (422a34–b6)

The organ of taste is, it seems, made moist in the process of tasting the object. This is because the object tasted, *as such*, is itself moist. In becoming like that object, the organ itself is moistened. This is, it appears, an essential part of what it is for the organ to be assimilated to the flavour (*chumos*). Later he develops this point as follows:

(4) Flavours are dependent on the differing dry elements in liquids (such as those of oil or salt: 422b10ff.). Flavours, like juices, are dependent on, for example, the water, oil, and salt they contain. The tongue is affected in virtue of its ability to be affected by them. Oily flavours are sweet, salty ones bitter (*De Sensu* 442a19ff.):[37]

> For taste happens because of the moisture with which one is in immediate contact as when the tongue is very wet, the contact is with the moisture originally on the tongue, as when someone first tries a strong flavour and then tastes some other flavour; or as with the sick to whom all things appear bitter because their tongue is full of bitter moisture. (422b6–10)

The role of moisture in (3) and (4) is important. It is not simply that a moist object is bound to moisten things in contact with it.[38] The moistening is not accidental to perceiving because the object of taste, as the object of taste, is itself moist. Since what is tasted is the flavour, the flavour is itself in some way moist. This is why the organ, in receiving a flavour, has to be moistened in the very activity of tasting it.

In the light of (3) and (4), tasting is not defined simply as the purely psychological exercise of ability to discriminate, or be aware of, bitterness.[39] It is instead an essentially embodied (moisture-involving) type of discrimination. The bodily organ is defined as that which has the capacity—when impacted by flavours—to

[37] As Aristotle's account develops, it emerges that the tongue (or parts of it) is the medium: flavour is carried on (or through) the tongue to the relevant sense organ.

[38] Burnyeat accepts this (2001: 136) while denying that the moistening is an essential part of the tasting itself (*pace* R.Bolton 2005: 227–8n.). Moistening is not, in Burnyeat's view, part of the definition of tasting as 'perceptual awareness, a mode of cognition' (2001: 141)—which is how Burnyeat understands taking on the form without the matter.

[39] For a discussion of this view, see Johansen (2012), who cites several others taking a similar view.

discriminate them in an essentially embodied way. Tasting is an inextricably embodied type of sensory capacity: one whose exercise essentially involves the organ of taste being moistened in a given way. One cannot define what the relevant type of perceptual awareness is without explicitly referring, in the definition, to moisture-involving discrimination.[40] If this is correct, Aristotle's account of tasting will follow the model developed for anger in *De Anima* 403a20ff. It too will be an essentially enmattered capacity defined in terms of a specific inextricably and distinctively psycho-physical type of activity.

Aristotle's detailed account of tasting further develops this pattern: the one at work in his discussion of desire (in Chapter 3) and of natural substances (in Chapter 2) which is motivated by similar concerns.[41] Or so I shall argue.

4.7 Tasting: problems for the spiritualist interpretation

Aristotle's picture, if the model just sketched is correct, is a simple one: the flavour in the medium operates on the sense organ which is moved in such a way that the perceiver discriminates, in a distinctively psycho-physical way, the flavour of the object. Is this his view? Did he fill it out in more detail?

The relevant types of discrimination are defined, in Aristotle's view, by their objects (*De Anima* 415a20ff.). Taste is a discrimination of flavours, smell of odours. We can make progress by understanding his account of the nature of these objects.

Flavours are, it appears, essentially enmattered in water and it is these which we discriminate: we are sensitive to, for example, the bitterness of the water or the sweetness of the apple. By contrast, smells are enmattered in air and water. As Aristotle remarks:

[40] That is, the changes involved are defined partly in terms of such material properties as heat and cold, dryness and moisture and, as such, are sensitive to material factors of this kind.

[41] In *De Sensu* 439a6–12, Aristotle writes: 'We have said in general terms before what is colour, noise, smell, taste, and touch but now we need to say what they do and what they are with regard to each sense organ … e.g. what is colour?' This looks like an attempt at definitions of colour and smell which are less general than those in *De Anima* and, in some way, specific to each sense. What is the precise relation between the works? There are, it seems, two, not inconsistent, points of connection:

(i) 436a1–4: focuses more on the actions and processes or activities of the objects sensed while *De Anima* focuses on the soul and its capacities, exposing just enough about their objects as is required for that purpose.

(ii) 439a8ff.: focuses on what each object of sense is and what it does so as to be perceptible: what they do in the medium so as to be perceived by the perceiver.

If this is correct, *De Sensu* offers specific and fuller definitions of each sense object (colour etc.: what they are) in such a way as to show why each is perceptible. However, so understood, it is an attempt to proceed further with the enquiry set out in *De Anima* 415a20ff.: begin with the objects sensed and define senses in terms of their sensitivity to these objects. This project, while it goes beyond what is necessary for basic four-cause style definitions, spells out more fully Aristotle's account, begun in *De Anima*, of what sensed objects are and how they impact on the medium and perceiver.

> What the dry produces in the moist, this the flavoured moist does in another area, in air and water in a similar fashion. (*De Sensu* 442b28–9)
>
> Smell in air and water is what flavour is in water. (443b15ff.)

There is a flavour when dry things are placed in water (422a15, 443a8f.). There is a smell when either air or water is affected.[42] Both flavours and odours are essentially matter-involving phenomenon. Flavour is present when water is affected by certain dry objects, odour when a feature found in both air or water is affected by a flavoured object. Aristotle calls the feature common to air and water 'the moist' (443a8) but does not specify its nature. However, whatever it is, it cannot be the same as being water. It is a feature, which like 'transparency', both water and air possess (443a1–2). Some objects, such as grapes, have both a flavour and a smell, their bouquet: the former is a property of water when it permeates dry material (441b18ff.), the latter of the moisture in the air or water, the effect of the dry material which, when permeated by water, gives that water its flavour: a distinctive property (441b18–20). A bitter drink will have, in Aristotle's terms, an enmattered (or, more precisely, an *enwatered*) form. Its water is enformed in a bitter way—which, when we perceive it, we taste as bitter. The form in question is bitterness-in-the-water. A bitter smell has, by contrast, an *enmoistened* form, where the type of moisture is common to both air and water: it is bitterness-in-the-moist. Aristotle needed to refer to the differing ways of being enmattered to define flavour and odour: the former is bitterness-in-water, the latter bitterness-in-the-moist. There is not one thing (bitterness) which both senses access in different ways. Instead, the relevant flavour is bitterness-in-water, the relevant odour bitterness-in-the-moist (as snubness is concavity-in-the-nose). These inextricably enmattered phenomena are prior to tasting and smelling in the way Aristotle required in *De Anima* 415a20ff. Tasting is sensitivity to, or discrimination of, bitterness-in-the-water, smelling to bitterness-in-the-moist. Neither smell nor flavour can be defined without reference to the capacities of the moist or the water involved. They are both inextricably matter-involving features: bitterness-in-the-moist (whether air or water) and bitterness-in-water respectively.[43]

[42] Aristotle compares a smell to the dipping or washing of the dry in a fluid: 445a14–15. (I follow the MSS in reading '*plusis*' (washing) rather than '*phusis*' (nature): Cook Wilson's emendation of '*plusis*' for '*phusis*' in 443a8, although tempting, is not required.) A smell is, it seems, regularly presented as a type of process in the medium. In *De Sensu*, he is concerned with the processes in the medium, with what each object of sense is and what it does (439a8ff.). While all such objects are said in *De Anima* to be perceptible and such as to cause perception, *De Sensu* focuses on what makes them perceptible, beginning with an account of what they are, and what they do in the medium. So understood, in *De Sensu*, he is providing specific and fuller definitions of each sense object (colour etc.: what they are) in such a way as to show in what way each is perceptible.

[43] In the case of smell, the relevant medium is found in air and water, both of which are moist, qua possessing the power to be modified by dry substances once they are placed in water (*De Sensu* 443a7ff.; *De Anima* 421b9f.). The effect of dry substances, when placed in water, on the moisture of air and water is similar to what they have when originally placed in water to create flavours (443b7ff.). In

When flavour is received in tasting, its reception is a moisture-involving type of reception. This is not simply because tasting is individuated by its object: a flavour, itself a water-involving form of bitterness. It is also because the reception of an enwatered form must itself involve—as an essential and constitutive part of its reception—the organ itself being moistened. This is, it seems, an essential part of the causal impact of a unified flavour on such an organ: what it is for it to receive, and be sensitive to, an enwatered form.

This conclusion coheres with Aristotle's subsequent remark, when discussing the intellect, that the relevant activities of receiving the relevant forms are enmattered in just the way and to the same extent as their objects are (*De Anima* 429b21–2). If the objects of taste and smell are enmattered, so too must be the activities of tasting and smelling. They will be matter-involving completions. But why did Aristotle hold this view?

One motivation is based in his view of the type of causation at issue. It is, it seems, a special case of his account of the role of forms as causes, discussed in Chapter 2. 'Flavouring' (the activity of flavour on the sense) is said in *De Anima* 426a13–15 to stand to the tasting as action to passion, a relation illustrated elsewhere by teaching and learning in *Physics* 202b16ff. We can spell this out in more detail on the basis of his remarks on active and passive causal capacities and their interaction.

In Aristotle's account, teaching is the providing of the very same form (or informational content) as the learner grasps. If the teacher says more but the learner does not grasp it, this additional information is not something that is taught (in this teaching). Or, conversely, if the brilliant learner (as not infrequently happens!) sees the implications of what the teacher has said but failed to make explicit, the surplus gained would not be what is taught (or learned) but a further implication of what is said. What is taught is precisely the same in content (and form) as what is learned. (For the teaching/learning case: see *Physics* Γ.3, 202b16–22; for the same form being conveyed: see *Physics* 202a9ff.) More specifically: what is transferred is the same form (the learner qua learner grasps what the teacher teaches). In the case of tasting, the form transferred is, for example, bitterness-in-the-water. This is what is tasted.

The flavour, bitterness-in-the water, acts on the sense organ (*poiēsis*), which, when we taste, suffers *(pathesis*) as a consequence of the activity of the flavour. The relevant capacities have to be enmattered in the *same type* of matter to be per se causes and effects in this type of causal interaction.[44] In his view, the agent and the patient must

effect, Aristotle compares the creation of smell in the moisture of the air or water with washing or dipping dry substances in moisture and liquid (445a14). They differ in that odours and flavours belong to moisture and water respectively and are caused to exist in different ways.

[44] This is an application of the general principle in *De Generatione et Corruptione* discussed in Chapter 2, Section 6. Aristotle comments 'body is by nature such as to be affected by body, flavour by

be possessed of the same general type of matter to be capable of 'flavouring' (to make up a term missing in 426a15 for the activity of the flavour) and tasting. Indeed, the relevant capacities can only be present in either when both the agent and patient are capable of being moistened in the relevant way. This is why tasting, for example, the bitterness-in-the-water, must itself be a moisture-involving activity. Moisture is required as something common to the agent and patient if they are to undergo this change. The active and passive capacities have themselves to be inextricably material to be per se causes and effects in the required way.[45]

Aristotle's remarks on smell follow a similar pattern. The sense organ of smell, he claims, is potentially dry (422a6ff.) but initially moist and cold (444a31ff.). In the case of taste, the organ was moistened in the process of tasting. In the case of smelling, by contrast, the sense organ is dried in smelling. In the latter case, the object sensed is said to be both dry and hot (in its own way) and to assimilate the sense organ to itself, when the latter smells the object. Something of the dryness and heat of the original dry material must be present in the moisture of the intervening air or water. If the sense organ were simply wet and cold (and not potentially dry or hot) it would not be affected by the dryness of the object: the impact of its dryness would be lost and there be no smelling. The relevant form, the result of the impact of the hot dry object on the moisture in, for example the air, heats and dries the sense organ when it receives (and is sensitive to) this form. There is, it seems, one unified object: bitterness-in-the-moist, which is sensed by the smeller. The discrimination of this object is itself an essentially embodied type of discrimination, the realization of, in our case, an air-based capacity to receive bitterness of this type through the air. The capacity to smell such objects is an essentially enmattered capacity, one enmattered, in air-based smellers, in the same type of 'matter' as the smell itself: air.[46]

These considerations suggest a way to challenge a second spiritualist argument which starts from two assumptions:

(1) The effect on the organ is of the same general type as the effect in the medium, and that

flavour, colour by colour and in general what is of the same kind by something of the same kind' (323b32ff.).

[45] Whether, as Aristotle notes, actually or potentially in the agent (*De Anima* 422a17ff.).

[46] The type of moisture in the air or water has to retain, if Aristotle's account of odour is to be successful, something of the dryness of the objects which were originally permeated by water to form a flavour. Indeed, this seems to be a constraint on the type of *moisture* which, in his theory, is required in both air and water. However, Aristotle made no attempt to spell out further what *moisture* is in this case. (He, almost certainly, lacked the empirical resources to do so.). *Moisture*, in his account, may be understood as a 'stand in' for the specific way in which odours are enmattered. It should further be noted that while what is smelled is, for example, bitterness-in-the-moist, this is consistent with there being smells in the objects themselves, such as in mature cheese or rotten fish, provided that they too contain *moisture*. However, neither of these issues concerning the nature of *moisture* needs to be addressed for the purposes of the present discussion.

(2) In the case of smell the effect in medium is not identical to a movement in the sense of a body going from place to place

and concludes that:

(3) All that essentially occurs in smelling is the smeller being aware of the odour.

(3) captures, for the spiritualist, the idea that the odour appears to the smeller. However, given what has just been said, Aristotle could accept both (1) and (2) without concluding that what occurs is a 'travelling of (pure) form alone' or that its reception is to be defined simply as a purely psychological awareness of a pure form, defined without essential refence to matter. In fact, these considerations point to a different conclusion: what it is for a flavour or odour to be tasted or smelled by a perceiver is for bitterness-in-water or bitterness-in-the-moist (enmattered forms) to be received by the relevant sense organ. If this is correct, and the effect in the sense organ is of the same general type as the effect in the medium (accepting (1)), the effect in the organ which constitutes smelling will also be a matter-involving type of completion.

(1) is a premise which Aristotle accepts (as we saw in his discussion of causation: Chapter 2, Section 6). In the specific case of taste: the operation of the flavour on the sense organ is a case of agency, of its acting on the sense organ. The organ itself is passive, suffering under the impact of the flavour. When there is acting and suffering of this type, the same form is transferred from agent to patient. In the case of flavour, the relevant type of form is a matter-involving form, such as bitterness-in-the-moist. Indeed, what makes tasting the type of perceiving it is, is that it is the reception of a matter-involving form of this type. Given that types of perceiving are defined in terms of their objects, tasting must be essentially a matter-involving activity (or completion). It is the agent's way of being sensitive to the relevant matter-involving form present in the medium. In cases of this type, the agent and patient must share the same type of matter if they are to possess the type of enmattered capacities which are per se causes and effects of the relevant process in the way suggested.[47]

[47] In *Physics* Γ.3 Aristotle describes individual cases of acting and suffering 'as the same but different in being'. Some, amongst them David Ross and Ursula Coope, have suggested that he understood these as cases of numerically one process with different descriptions true of it. Others, including Charles (1984: 14–19) and Anna Marmodoro (2007: 205–32), have taken them to be numerically distinct, but necessarily connected, processes. Others, including Charles (2015: 186–205), have argued that Aristotle did not, and did not need to, decide between these alternatives in *Physics* Γ.3 in order to address the problems at issue there. Indeed, elsewhere he talks of phenomena as being 'one and the same' when discussing cases which are necessarily co-extensive as well as those where there is one (definitional) account: see *Metaphysics* 1003b22–5. The present discussion is intended to be neutral as between these alternatives. When I talk of the 'same individual process (or activity)', it is left open

The spiritualist underestimates what is essential, in Aristotle's account, to the impact of the flavour on perceivers. It is not just that, in successful cases, the flavour of an object is revealed to them (in a pure psychological act): there is an essentially moisture-involving process which, as part of his causal account, results in their being aware, in an essentially embodied way, of an enmoistened flavour. His account of taste, it seems, runs as follows:

(1) The flavour in the moist impacts on the sense organ by moistening it in such a way that it (or the person) senses the flavour (we do not sense its wetness or moisture but its flavour).
(2) Sensing the flavour is the exercise of the matter-involving capacity of such an organ: the capacity to sense the flavour in a moisture-involving way.

The change essentially involved in tasting is, it appears, a [Type 2] change: a matter-involving completion. There is more to tasting than simply purely psychological (or phenomenal) awareness of flavour. What occurs is essentially an embodied awareness of flavour, an inextricably enmoistened activity, essentially the realization of inextricably enmattered, goal-directed, capacity. As such, this activity, like the activity of the angry, has an impure form.[48]

In sum: in the case of taste and smell, one cannot define the relevant type of perceptual awareness without referring, in the definition, to material changes in the sense organ. For these are essential to the occurrence of the relevant types of perceptual awareness and are required to explain the distinctive nature of specific types of perception (why they have the features they do: being of certain tastes rather than others). Further, the material changes involved are partially described in terms of material properties such as moisture and are sensitive to such factors as heat and cold.[49] One cannot define these forms of perceptual awareness without reference, as part of the definition, to material activities in the relevant part of the body. Tasting and smelling, like being angry, are inextricably psycho-physical activities, the realizations of distinct inextricably enmattered capacities. This is the core of Aristotle's theory of tasting and smelling, the basis for his definition of the essential inextricably psycho-physical phenomena (the relevant activity type and the capacity from which it flows) in terms of their inextricably enmattered forms.

which of these alternatives is to be preferred. The central claims in the inextricabilist interpretation do not rest on taking one or other of these options.

[48] I shall return to this issue in Chapter 6.

[49] Perceptions also produce changes in the size and temperature of other parts of the body (see *De Motu* 701b19ff.). It is difficult to see how they can do this unless they have the physical properties required to induce change in size or temperature.

4.8 Tasting: problems for the non-reductionist materialist interpretation

According to non-reductionist materialist interpreters, Aristotle's account of tasting is not simply constituted by the purely psychological (or phenomenal) awareness of flavour (suggested by the spiritualist). It is this type of awareness *plus* a further [Type 1] physical event which is (i) required for that awareness (ii) defined independently of it and (iii) grounds (in some way) the psychological properties of tasting. These interpreters take the view of the purely psychological recommended by the spiritualist and add to it a further purely physical event to complete the full definition of tasting.[50]

There is, for all materialist interpreters, an ordinary purely physical [Type 1] change, such as moistening, which is systematically correlated with, and in some way underlies the taster's awareness of, the relevant flavour. In some non-reductionist accounts, awareness of flavour supervenes on a moistening of this type; in others, there is a type of moistening, always present when we taste flavours, where the specific type of moisture received 'encodes' information that is essential to a separate act of tasting.[51] But these differences, important though they are, are not relevant to our present concerns. In all such accounts, the initial physical changes, however characterized, will—in some way—underlie a purely psychological activity of perceptual awareness of flavour.

In the non-reductionist account, there is a specific fully determinate type of moistening (and moisture), a purely physical [Type 1] change defined independently of the capacity to taste flavours, which grounds the activity of awareness. However, as spiritualists have noted, Aristotle shows no interest in any such purely physical grounding process in *De Anima* or *De Sensu*. The type of moistening involved is defined as one essential to the realization of a capacity, or an organ, designed to taste flavours (see, for example, *De Anima* 422b15ff.). The activity of the flavour in the sense organ (*poiēsis*) results in the sense organ being moistened in the distinctive way sense organs are. The relevant sufferings (*pathēseis*) are those of distinctive types of perceptual organ. They are not defined independently of organs of this type. Further, what occurs in the sense organ is defined as a bringing of that sense organ into 'actuality'. As such, it is a completion (*epiteleiōsis*),

[50] Several recent writers (following Burnyeat) have suggested that there is a further purely physical process required for perception (perhaps as a necessary concomitant) which is not connected to the purely psychological one as 'matter to form'. Even though it is not clear what exactly they intend by the phrase 'not as a matter to form', they wish to contrast the case of perception with that of anger (where talk of matter and form seems required).

[51] For an example of the latter account, see Johnstone (2012: 143–83). Johnstone offers an interpretation, which although non-reductive, suggests a type–type correlation between smelling and the underlying physical process. The latter, in his view, contains a determinate type of dryness which 'encodes' the type of odour of which we are aware in smelling. I am indebted to Mark Johnstone for helpful comments on the issues discussed in this chapter.

not a destructive [Type 1] change—since the capacity in the organ required for the change in question survives the change intact, when all goes well. This completion, which essentially involves the organ being moistened, is the suffering of a sense organ brought about by 'flavouring', where the organ is one designed for tasting. It is not a [Type 1] moistening of the type the non-reductionist requires: an independently defined purely material process essentially involved in, and the material ground for, tasting.

Aristotle, in *Meteorologica* 384b30ff., distinguished types of moisture and heat present in goal-directed bodies in terms of (i) the ways they act on the senses and (ii) their other qualities: such as proneness to solidify, melt, or break other objects. In this context, he makes no attempt to explain their action on the senses in terms of their [Type 2] qualities alone, still less in terms of features of basic elements. That a moist body affects the senses in a given way (in organized bodies) is treated as a way of differentiating the relevant type of moisture. There is no mention of purely material types of moisture in this case, defined in terms of [Type 2] alone. Nor does he seek to use [Type 2] features as a basis for defining the impact of moisture on the senses. Indeed, there is no indication of Aristotle attempting to develop the resources required to give a [Type 1] purely material characterization of the type of moistening which grounds tasting in a complex, goal-directed, body.

Some non-reductionist interpreters have appealed to Aristotle's discussion in *Physics* H (VII).3 to support their suggestion that, in the relevant cases, psychological completions 'supervene' on, or in some other way are grounded by, purely material processes of alteration. In this chapter Aristotle notes that when some completions occur it may be necessary that something is altered. Perhaps, for example, in the case of completing a house, the matter in question needs to be heated or thickened (246a5–8) in such a way as to necessitate its completion. Perhaps here he was aiming to characterize the material features in their own terms in such a way that, for example, psychological states (or form more generally) supervene on them.[52]

What do Aristotle's observations in *Physics* H.3 actually establish? He writes, concerning the virtues and vices of the body:

> Neither these states (*hexeis*) nor losing or gaining them are quality changes but perhaps it is necessary that they come to be or pass away when the qualities of certain things are changed. (246b13–15)

However, even if we disregard the cautionary 'perhaps', this is not a clear statement of the view that the relevant quality changes necessitate (or ground) the acquisition or loss of these states. It could be taken simply as the concession that

[52] Michael Wedin (1993: 49–105) and Victor Caston (1993: 107–35). For further discussion of these passages, see Maso, Natali, and Seel (2012).

the acquisition and loss of such states requires (as a necessary condition) some change in quality. It does not require that their acquisition supervenes on, or is determined by, these quality changes.[53] Indeed, this less demanding claim seems to be all that is required in a context in which Aristotle is emphasizing that the acquisition of bodily virtues is a completion, even if some quality changes are necessarily involved. He has no reason to make, out of the blue, the further, upwards determination, claim. It is one thing to suggest that health, beauty, and other bodily virtues require a mixture of material ingredients, quite another to insist that the latter determine health and the rest. Further, there is nothing in this context which suggests that he saw the relevant mixtures as defined in purely material terms. The mixtures (or mixings) could be defined just as those required for health. Indeed, this would mirror his way of talking of the way the ingredients of flesh and bone are mixed (*De Anima* 408a15f.): in just the way required to produce them. There is no reason to think that Aristotle is trying, in these two lines in *Physics* H.3, to introduce an explanatory, materialist, account of conditions sufficient for the acquisition, presence, or loss of health.

There is a further problem: Aristotle's remark in 246b13–15 shows at most that *some* completions require ordinary alterations, not that *all* do. In the case of knowledge acquisition or manifestation, no such alteration is essentially involved (247b7–8). It may be that some [Type 1] changes are needed as a causal background for the [Type 2] changes in epistemic states that occur. A person may need to 'sober up' (in Aristotle's example: 248a4ff.) to be able to become a knower. Their sobering up is what enables them to come to know, not what their coming to know supervenes on. Even if Aristotle had held, contrary to my previous reservations, that ordinary alterations provide the subvening ground for the acquisition of health or other bodily virtues, he did not extend this account to the case of knowledge. Indeed, he seems unconvinced that there are any such alterations in the similar cases of coming to see or touch something (247b8–10).

Aristotle's discussion of the acquisition of virtues of the soul (246b21–247a19) is revealing. He claims that when they (and their opposing vices) are acquired or lost there are bodily pleasures and pains, here described as quality changes of the perceptual part (247a15–17: see 247a5–6). But there is no suggestion that such pleasures and pains (of taste or touch) are to be defined wholly in terms of basic material elements (such as the hot and the cold). Elsewhere these changes are classified as 'common to the body and the soul' (*De Sensu* 436a10f.): essentially psycho-physical phenomena. They are not the type of purely material, grounding, change non-reductionist interpreters require.

[53] Similar remarks apply to the equally cautious claim in 246a6–8 and the less cautious claim about the acquisition and loss of virtues of the soul in 247a5–6. In the latter case, the relevant changes in the perceptual part may only be necessary conditions for their occurrence.

How, according to Aristotle's account in *Physics* H.3, are ordinary [Type 1] quality changes involved? Earlier it was suggested that as in the case of knowledge acquisition, a completion, one could describe what happened in any particular case as a transition from one specific state of the soul to another. This would be an accidental description of the relevant completion, which was defined essentially as the manifestation of a goal-directed capacity for knowledge. Its beginning with that specific false belief (rather than another) is an accidental feature of the completion that occurred. A similar account could be offered of a builder's completing the house. Any description of it as a [Type 1] change, such as beginning with five bricks required to finish the job (and not three), would be an accidental description of the completion that occurred. In neither case would there be any further alteration. Indeed, to describe what happened as a quality alteration would not be the best thing to say: this would only be an accidental description of the completion of the house (the one activity that really occurred).

Aristotle's description of the role of pleasures and pains in the acquisition of virtues and vices seems to exemplify just this structure. Although in *Physics* H.3, these are described as quality changes (247a16), elsewhere he notes that some pleasures, those which have a further end, are ones in which 'one is led towards the completion of one's nature' (*Nicomachean/Eudemian Ethics* 1153a12). He continues:

> And this is why it is not a fine thing to say that a pleasure is a perceived generation (*geneseis*): rather it should be said to be an activity of a natural condition (*hexis*).

These pleasures are best described as 'completions', activities which bring one to one's natural goal. To describe them as [Type 1] quality changes (or comings into being) would not be speaking finely, even if—to make this consistent with his remark in *Physics* H.3, 247a16f.—one is not speaking falsely. To do so is to give an accidental, and incomplete, description of the completion that occurs. To describe it as an alteration, without essential reference to the natural states being completed (or exercised), is to fail to capture the essence of what happened. No separate quality change need occur. In these cases, there are essentially [Type 2] changes described accidentally in [Type 1] ways.

Perhaps this is how Aristotle saw the relevant ontology in these cases. Maybe he generalized this model in his discussion of seeing, touching, and perceiving in general. In these too there will be just one essentially psycho-physical [Type 2] activity which can be described accidentally in [Type 1] ways. All that happens in any case of tasting or smelling is just a [Type 2] completion of this kind.

The evidence of *Physics* H.3 is not conclusive. Aristotle might have thought that, for example, all individual cases of finishing a house were accompanied by some distinct particular ordinary, [Type 1], alteration or other: an instance of the

type of lifting, carrying, or heating of bricks required to complete the house. However, even if he did so, the distinct [Type 1] alterations would, so understood, be essentially ones guided by the builder's skill. These intentional actions, like the pleasures or pains mentioned later in H.3, would be essentially psycho-physical alterations: ones common to body and soul. They would not be the type of material ground the non-reductionist materialist interpreter requires. This is because the identity of the [Type 1] alteration, and how it develops, is dependent on the knowledge exercised in completing the house. The type of lifting or heating is a skill-directed lifting or heating, the particular liftings instances of this type. Indeed, which [Type 1] alteration occurs is determined by the way the [Type 2] completion develops: how the builder proceeds to complete the house.

If Aristotle applied this latter model to the case of tasting, the particular moistening that occurs would be an instance of the type of moistening required for tasting. It would be defined in this way, not simply as an instance of a general, purely material, capacity for moistening. This is because to do the latter would be to fail to capture why the [Type 1] alteration develops and ends as it does. Instead, the [Type 1] alteration at issue will, on this model, itself be essentially psycho-physical, whose identity and nature is dependent on the [Type 2] exercise of the enmattered capacity to taste involved. Introducing a further [Type 1] alteration of this type to add to the explanatorily more fundamental [Type 2] completion might have seemed a piece of 'harmless ontologizing'. The further [Type 1] alteration will not, in any event, ground the [Type 2] completion in the way the non-reductionist suggests nor be the realization of a separate purely material capacity.

It is not clear which of these two ontological models best captures Aristotle's intentions. But, either way, his resulting picture will be that of an inextricabilist. The [Type 2] activity of tasting cannot be defined without explicit reference to an enmattered, goal-directed, capacity. Nor can the [Type 1] material alteration be defined without explicit reference, in one of the ways mentioned, to the psychological activity of tasting. Whichever option Aristotle favoured, there will be a unified, definitionally inextricable, response in the taster. Indeed, once his inextricabilist claims had been secured, he might have been happy—given his goals—to use either model to present his central claims. Perhaps he did not need to decide between them.[54]

There is one further aspect of the non-reductionist materialist account of perception that requires scrutiny: the suggestion that the activity of awareness of a taste is purely psychological, defined without essential reference to moistening. If tasting is of flavour and flavour is an enmoistened form, tasting itself must be the reception of an enmoistened form. To taste is to be sensitive to, and receptive of, an essentially moisture-involving form of this type: bitterness-in-the-water.

[54] See also note 47 above. For further discussion of this issue, see Chapter 8, Section 6.

There is no receiving of bitterness of this type which is not moisture-involving. To taste is to sense an enmoistened flavour in a moisture-involving way. Absent this, and what occurs will not be a tasting of flavour. (It might be a case of imagining that one was tasting flavour: a way of engaging with the relevant form without doing so then in the specifically moisture-involving way a perceiver does.) Or so I have argued.

The same general type of activity (at least with respect to the form involved) is found, in Aristotle's account, in the agent and patient. It is not that the agent operates without actually possessing the form and the patient (somehow mysteriously) injects it on receiving a lower level prompt received from the agent. Nor does the patient initially lose the form transferred to it from the agent only (again somewhat mysteriously) to regain it later in grasping the form. In the case of tasting, the activity of the agent (the enmattered flavour in the moisture) has to be of the same general type as the activity of the taster. If so, since the former is essentially a moisture-involving activity, so too is the latter. Tasting is to be defined as the moisture-involving activity of receiving the relevant form: bitterness-in-the-moist. This is the type of inextricably psycho-physical activity it is. (These considerations follow the pattern discerned in Chapter 2 and exemplified by the discussion of desire in Chapter 3.)[55]

There is a related issue. Even if one were to concede, for the sake of argument, that Aristotle was (despite appearances to the contrary) assuming that a [Type 1] purely material moistening is present in the perceiver, how does this process, in his view, 'underlie' or 'ground' the perceptual awareness of flavour? How, in his account, does a perceptual awareness of flavour, in his view, arise out of simple moistening? What is it about some types of moistening, wholly defined in purely material terms, that 'grounds' perceptual sensitivity to flavours as flavours? Non-reductionist interpreters cannot allow that, for Aristotle, the relevant moistening is merely a necessary condition for tasting. If it were, their account would be in danger of collapsing into a version of spiritualism.

Aristotle must have thought, if the non-reductionist account is correct, that [Type 1] purely material changes ground the perceiver's awareness of flavour. How do they do so? There is no obvious sign that Aristotle attempted to answer this pressing question. We are confronted, as in Chapter 3 when discussing the relation between desire and bodily action, by an unnerving silence at just the point where, as interpreted by the materialist, a theory is most required. What is it

[55] If tasting had been defined, in the purist fashion, simply as the reception (or cognition) of flavour (itself defined without essential reference to the moist), why would tasting (so defined) have required, or hypothetically necessitated, the presence of moistening? That is: if reception of flavour can be defined solely in terms of, for example, awareness of bitterness (or sweetness), without any reference to moisture, why should such awareness, in its nature, require the presence of moisture rather than air? It is not enough to say that tasting, as things are, involves moisture. One needs to explain from the nature of the psychological act of tasting itself why this must be so. For a contrasting account: see Johansen (2012: 168).

about moistening, defined in purely material terms, that generates, in his account, awareness of flavour? Aristotle's silence on this issue is particularly telling. In *De Sensu* 442a30ff., he criticized Democritus' theory of perception precisely because it leaves just such a gap between the physical impact of the atoms on perceivers and their perceiving colours or tastes. Non-reductionist interpreters need to explain why Aristotle thought that his own account, as they understand it, is immune from the type of criticism he levelled against Democritus. It is not an act of charity to present him as (blissfully) unaware of precisely the same type of gap in his own theory!

Sophisticated proponents of the non-reductionist interpretation have addressed this issue, itself a micro-version of our own post-Cartesian general mind–body problem. Some have suggested that the awareness of a bitter flavour instantiates, in Aristotle's account, the same ratio as is found in the [Type 1] change of moistening by a bitter juice. We are aware of a particular *flavour* because the activity of tasting instantiates the same ratio as is present in the relevant type of moistening. On this interpretation, there will be a [Type 1] process of moistening which can ground the activity of tasting bitterness because both instantiate the same ratio. (The activity of tasting is defined psychologically but will be, in their view, necessarily enmattered in something other than moisture: e.g. heat or dryness.)[56]

This last suggestion, in aiming to explain (at least in outline) how the perception of flavour emerges from moistening, marks a significant advance on interpretations which talk freely of 'supervenience', 'upwards determination', and 'grounding', without indicating why Aristotle might have found such claims true or intelligible. However, even this more sophisticated interpretation encounters serious problems, some exegetical, others theoretical.

One might ask, at the outset, the following theoretical question: what—absent moisture—makes the relevant type of perceptual awareness one of tasting a flavour? There are, after all, ratios instantiated in other types of perception. Indeed, as we have seen, the same ratios may be present both in smells and flavours. If we remove Aristotle's suggestion that in the latter case what is perceived is bitterness-in-the-moist and in the former bitterness-in-the-air, what makes one case a tasting, the other a smelling? A major explanatory gap remains. Aristotle, so interpreted, still lacks an explanation of why we taste bitter flavours rather than being aware (somehow) of ratios found in water and air. At the crucial point, there is, once again, an unnerving silence in his account.

While the exegetical evidence in favour of this proposal will be assessed below, the considerable effort expended in constructing these ingenious non-reductionist interpretations on the basis of a few phrases is, from the inextricabilist viewpoint, 'wasted labour'. If tasting is the awareness of bitterness-in-water, a phenomenon

[56] See, for example, Caston (2005: 306).

that is essentially enmattered in the moist, tasting must itself be an essentially embodied, moisture-involving, activity. It will not be defined as a combination of an ordinary [Type 1] moistening plus a distinct type of psychological activity, such as ratio detection, where that activity and its object are defined independently of moistening. The specific type of moistening will be defined in inextricably psycho-physical terms as the moistening of a perceptual organ: the activation of its capacity to taste. There is, from this viewpoint, no need to search in his writings, as materialist interpreters do, for specific types of purely physical alterations, still less to devise increasingly subtle and sophisticated accounts of their connection with purely psychological ones. Indeed, we should not be surprised, against the background of his general view of the matter and form of natural substances (as set out in Chapter 2), to find no clear signs of his carrying through this project. The simplest explanation is that he was operating with fundamentally different, non-Cartesian, assumptions about the psychological and the physical. To seek to understand his account on the basis of our post-Cartesian assumptions is to be in danger of losing what is philosophically most significant about it.

Many non-reductionist interpreters reason as follows: there must be, they correctly think, more to tasting than awareness of flavour as defined in the spiritualist account. So, they conclude, there must be a separate independently defined, further purely physical, process (a [Type 1] process) essentially involved in perceiving, which underlies that awareness.

We can now diagnose their misstep. While tasting is, in Aristotle's account, more than simply (pure) awareness of flavour, it is not a type of pure awareness plus a further purely physical underlying process. Instead, tasting is, in his view, an inextricably psycho-physical completion, which is (in its own nature) essentially and inextricably a moisture-involving responding to flavour in the medium. He had no need to supplement his story by hypothesizing the existence of a further purely physical underlying process to ground the purely psychological activity of awareness or to worry about the connection between these two definitionally independent components. The type of moistening at issue could not occur in something other than a sense organ: it is defined as a moistening-of-such-an-organ. The psycho-physical capacities of this organ are the only capacities which are essential to tasting.[57]

[57] This formulation is strictly neutral on the issue raised above: is there a numerically psycho-physical distinct process (in the sense organ) which underlies the psycho-physical activity of discrimination? Or is there numerically one activity which can be described in different ways? My immediate aim is to challenge the claim that there is an underlying (grounding) purely physical process, defined independently of discrimination, in these cases.

4.9 Tasting and smelling: a summary

In Aristotle's account of tasting:

[1] The person's discriminating flavour is the same activity as their sense organ's being affected by flavour.
[2] Their sense organ being affected by flavour is the same activity as the flavour affecting the sense organ [acting and suffering: *poiēsis/pathēsis*].[58]
[3] In cases of acting and suffering, the acting and suffering are (i) the same in general type and such that (ii) the patient receives what the agent gives [causal principle].
[4] The flavour which affects the sense organ is essentially a matter-involving phenomenon (such as bitterness-in-water) which (i) affects the sense organ in essentially matter-involving ways (such as moistening it) in such a way that (ii) the patient receives what the agent gives (e.g. bitterness in the water) [from [2] and [3]].
[5] The person's discriminating of flavour is essentially a matter-involving type of activity: its organ being moistened in such a way that the patient receives the bitterness-in-the-water [from [4] and [1]].

Both tasting and smelling are affections 'common to the body and soul' because what is perceived in both cases is an enmattered form (such as bitterness-in-the-water or bitterness-in-the-air) and the perceiving itself is the realization of an enmattered capacity. Tasting is the realization of a capacity of the relevant bodily organ—if affected by the flavour—to be moistened in such a way as to taste that flavour. Smelling, similarly, is the realization of the capacity of a distinct bodily organ—if affected by a smell in the medium—to be dried in such a way as to sense that smell.

Tasting and smelling, if this is correct, are 'common to the body and soul' in the same way as anger, fear, and desire. Tasting and smelling, like the emotions and desire, will both be, in the ways indicated, inextricably psycho-physical, not decomposable into two definitionally independent components in the way post-Cartesian philosophers standardly assume. The relevant type of activity is defined, in Aristotle's simple theory, as inextricably psycho-physical, the realization of an inextricably psycho-physical goal-directed material capacity. Both the form and the matter of tasting and smelling are, in these ways, inextricably psycho-physical.

[58] See note 47 above for further clarification of my understanding of Aristotle's talk of 'the same activity'.

4.10 The case of touch

Does touching, in Aristotle's view, follow the same pattern? Some aspects of his discussion suggest [H.1]-style considerations:

(1) Some types of perceptual impact are said to be too strong for the sense organ to bear and to destroy the relevant 'formula' (*logos*) of the body in the same ways as some heavy blows might break a musical instrument. When this happens, the animal with the damaged sense organ can no longer perceive (424a28–32). Clearly, it is necessary for perception that there be a basically undamaged sense organ present (where such an organ is a bodily magnitude: 424a26–7). If there is no such appropriate bodily state present, there will be no suffering for the relevant objects of sense (424a32ff.).

Other remarks suggest [H.2]-style considerations:

(2) In the case of touch, the sense organ is said to be affected by the blow struck as a man is struck through his shield (423b15ff.). Later, Aristotle invokes the analogy with the lyre: here too the way in which the lyre is struck (424b32ff.) determines the sharpness of the note produced.[59] The speed of the blow determines the type of note emitted. In the case of a blow experienced as through a shield, the type of experience will be determined by the speed and heaviness of the blow struck.

(3) The sense organ is, in his view, incapable of sensing objects as warm as it is (423b27ff.) but only ones which are warmer or colder than it. This tells us something more about the way in which the relevant sense organ is struck in these cases. Only warmer or colder objects can produce the type of blow (or change) in the sense organ which is required if it is to register their temperature. Objects of the same temperature cannot do this. In this case, the effectiveness of the blow to the sense organ depends on its heat and that of the striker.

Why is (3) the case? If all that occurs is a purely psychological act of touch-perception, why should the perceptual faculty not be able to sense an object of the same temperature as its sense organ? Why couldn't it simply register the external object's temperature as being the same as its own? Something more must be involved: a type of suffering which is dependent on the initial heat of the organ

[59] Aristotle makes a similar correlation between the quickness of the movement of air in the relevant sense organ and the sharpness of the sound heard. In the case of hearing, animals only hear because the air inside their ears is moved (420a2ff.). Aristotle speaks of the part to be moved as containing air and being ensouled (420a7).

and which is not possible if that is the same as that of the external object. It is hard to see how a suffering of this type, one determined by these factors, is not either a physical or psycho-physical change in the sense organ, which requires it to be of such a temperature that it can be affected in some way by the impact made by the heat of the external object (via the medium). For if the change essentially involved in touching is not physical (or psycho-physical), why should its occurrence (and non-occurrence) be dependent on the initial heat of the sense organ?

Aristotle does not (in B.11) attempt to specify the type of physical (or psycho-physical) change involved in the case of touch. There is, however, no need to assume that the organ of touch is itself heated in the way water is in being touched. That which is of mean temperature could register the heat of an external object by being affected by it in some other way. Consider a possible analogy: red objects fail to absorb red light *not* because they cannot be made even more red by the source of the light but because they have limited abilities for absorption: they cannot respond in this way to the colour in question. By contrast, the 'transparent' will respond when red light is played on to it. In a similar way, the organ of touch might fail to register objects of the same heat because it lacks a similar quasi-reflective ability. By contrast, when it responds to objects of greater or lesser heat, it is enough that it responds to them in this (quasi-reflective) way. It need not be literally made hotter by them. (Analogy: a thermometer might be designed to register on its scale only temperatures greater or less than its own.)

Consider Aristotle's case of the lyre. Here, the speed of the blow determines the sharpness of the note produced. The quickness of the movement is, as we noted, registered perceptually in the sharpness, not in the speed, of the sound heard. It is enough that the impact of the blow is registered in some way or other. It need not be registered by the sense organ (or string) affected itself being literally speeded up.

In the case of touch, one cannot, given [H.2] considerations, define the relevant type of perceiving without reference to some material movements in the sense organ. For these are essential to the occurrence of tactile perception and are invoked to explain why it sometimes fails and why specific perceptions have the features they do. Further, these changes are described in part in terms of their physical properties (force and speed) and are sensitive to such factors as heat and cold.[60] As in the case of anger, one cannot define this form of perception without essential and explicit reference to physical movements of the relevant part of the body. Sensing heat is the inextricably material realization of an inextricably material capacity.

[60] Perceptions also produce changes in the size and temperature of other parts of the body (see *De Motu* 701b19ff.). It is difficult to see how they can do this unless they have the physical properties required to induce change in size or temperature.

In the case of touch, when the sense organ is affected, that which is in the mean state is moved in a given way. The mean is what discriminates hot and cold (424a5–7) by being affected by them. It appears that the very same process is the mean's being moved in a given way and its discriminating a given temperature. There is no suggestion that there are two separate changes: the mean's being moved and its discriminating heat. The mean is, it seems, the ensouled part which is affected by the relevant movement (see 420a7), the one which discriminates heat or coldness.

4.11 Taking on the form without the matter

Does Aristotle's account of tasting, smelling, and touching, as interpreted in the previous sections, provide the basis for understanding the summary of his views on sense perception in *De Anima* B.12? In this section, I shall seek to show that it does.

Aristotle speaks elsewhere of perceptual discrimination as *the* activity of sense in the sense organ (426b7ff.). He is, it seems, committed to the following claim:

[I] that which is in the mean state being active in way A is the same activity as the sense's discriminating B.

He does not, as we have seen, seek to account for the mean's being moved in a given manner solely in terms of the sense's discriminating its object in the pure, non-matter-involving, way the spiritualist interpreter suggests. The relevant type of discrimination essentially involves some bodily processes in the sense organ. Nor is the movement in the sense organ to be defined independently of the sense's discriminating its object. If so, the bodily process and the relevant discrimination will be inter-defined: in Aristotle's terminology, the same activity.

Is this Aristotle's consistent view in *De Anima* B.12? More specifically: is (i) the relevant bodily process, as understood in this chapter, defined by reference to the end it serves and the psychological capacity with which it engages: one directed to the discrimination of the relevant sense objects? and (ii) the relevant discrimination itself defined as an embodied reception of an enmattered form, the essentially embodied exercise of an inextricably embodied capacity? Is there just one essentially psycho-physical activity (type) in each of these cases?

I shall sketch an affirmative answer to both questions. Aristotle begins this chapter as follows:

> The sense (in each case) is that which receives perceptible qualities without receiving the matter [of those things which have the perceptible qualities] just as the wax receives the sign on the ring without receiving the lead or

> gold. It receives the golden or bronze sign but not in so far as it is golden or bronze. (424a17–21)

At this stage in his discussion he does not distinguish between the sense and the sense organ but speaks freely of the former being affected by sensible qualities. (This issue is clarified later.) His point is that in cases of sense perception the relevant sense is affected by the relevant sensible qualities of objects, without being affected by the matter of the objects to which those sense qualities belong.[61] He seeks to make this idea more precise on the basis of an analogy with marks made in wax, noting two things:

(1) the wax receives the sign on the ring but does not receive the lead or gold of the ring;

(2) the wax receives the golden or bronze sign but not in so far as it is gold or bronze.

What do these claims say about the change involved? According to (1), the wax is affected by the sign on the ring but not by the lead or gold of the ring. In one way this is true: the wax receives the sign but does not receive gold or lead from the ring. That is, the material nature of the wax is not changed so as to become more like gold or lead. It certainly does not take in gold or lead matter from the ring but remains wax throughout. However, it is not true (at least without qualification) that: if the ring is golden, the wax is not affected (in some way) by the gold in the ring. The gold presses down on the wax to leave the mark. So, Aristotle adds a further qualification to (2): whether the sign belongs to a golden or bronze ring makes no difference to what is received by the wax. That is, there is nothing about the mark imprinted in the wax that shows that it is made by a bronze rather than a golden ring. The wax registers some features of the ring (its sign/shape) but not others (its material composition).
Aristotle, so interpreted, is making just two points:

(a) the material nature of the wax (as wax) is not changed by what happens (in contrast with cases where the wax is heated and melts); and

[61] I understand the phrase 'receiving the form without the matter' adverbially as shorthand for receiving the Form without receiving the matter. This reading does not require Aristotle to talk of a new entity: *the Form without the matter*, which is received when we perceive. This distinction is important as the adverbial reading allows Aristotle to maintain that it is the very same form that is in the object and received by the perceiver. The second reading, by contrast, commits him to there being two objects involved in perceiving: the enmattered Form in the object and a matter-free Form which is received by the perceiver. The latter account is the basis for talk of a separate 'intentional' object which is perceived; the first has no such commitments. I am indebted at this point to discussion with Paolo Crivelli.

(b) the wax is unaffected by certain features of the gold ring (its being golden) and only affected by others (such as having a certain shape). It is, we might say, selectively affected by certain aspects of the ring.[62]

Both ideas are at work in his immediately preceding discussion of touch. The sense organ, when all goes well, is unaffected by the object in question: its material nature is not changed to be made more golden or even hotter by the impact on it of the hot golden object. Second, it is responsive (in the way it is) only to certain features, such as the heat of the object. Whether the heat belongs to a bronze or golden object makes no difference to the perceiver's experience. There is nothing about the experience that shows that it is made by a golden rather than a bronze object. The change in the sense organ (1) does not change its material nature and (2) is based only on certain relevant features of the object. The tactile mean, introduced in *De Anima* B.11, allows Aristotle to describe in outline how this can happen: the tactile sense organ can register heat without its relevant material nature being changed (or itself necessarily being heated). It is enough that it responds in some way to the heat of the object (424a5ff.). This discriminatory response is to a specific type of enmattered form: the heat of the object involved in this case. It does not discriminate the iron in the poker which is hot.

Similar features are present in the case of taste. The sense organ is responsive to certain features of the drink tasted. We taste, as we have seen, the bitterness-in-the-water not the water itself. The sense organ is sensitive to this type of enmattered (or enmoistened) form not to the matter itself. This is why in tasting we receive the form without receiving the matter: we taste bitterness-in-the-moist not the moist, the matter in which the form is presented to the sense organ. While tasting essentially involves that sense organ's being moistened, what is tasted is the enmattered form: bitterness or sweetness in the moist. Similarly, smelling is sensitivity to bitterness-in-the-air or the-moist, a different enmattered form. One does not smell the air or the moisture but the bitterness therein. In this way, both tasting and smelling receive the form without receiving the matter.

Aristotle develops these points in what follows:

> In a similar way the sense for each object is affected by that which has colour or flavour or sound, not in so far as each of those things is said to be [what it is:

[62] I understand the phase 'without the matter' as indicating just these two claims. It does not mean that there is no physical (or material) change in the organ (or wax). After all, the latter is physically moulded by the mark on the ring. (Indeed, in *De Anima* 412b6–8 the wax and the shape there are mentioned as a paradigm case of a unified phenomenon.) Instead, the phrase indicates that (i) the wax does not take in matter from the gold, (ii) the wax does not change so as to become more like gold (it is not in either way assimilated to gold), and (iii) the golden nature of the ring does not (in the appropriate way) affect the nature of the impact made. ((iii) would be true even if this very type of impact could only be made by a gold ring. The fact that the imprint had been made by a gold ring would not be clear on the basis of the impact alone. One would need a lot of additional background information to work this out.)

> such as a house] but in so far as it is of this type [coloured, flavoured . . .] and in accordance with the formula (*logos*). (424a22–4)

What does the last phrase mean? If it is understood as 'in accordance with the formula of it as a sense', it matches the earlier phrase ('in accordance with the account of each as the thing they are') and explains the transition to the following sentence: 'the sense organ is the first thing in which this kind of capacity is present' (424a24–5). It is because the capacity is the one required for tasting that the sense organ can be correctly described as the first thing in which this kind of capacity is present.[63] This is, it seems, why Aristotle continues:

> The sense organ is the same as that in which this kind of capacity is underivatively present [viz. the sense], but they are different in being. For that which perceives [viz. the sense organ] is a kind of magnitude but neither that which is capable of perception nor the sense itself is a magnitude; they are rather a kind of formula or capacity of the sense organ. (424a26–8)

The sense organ is essentially extended. It is the place in which the perceptual capacity is located. But the capacity to taste is not itself essentially extended. Neither is the sense (that which is, in the first place, capable of perceiving). Rather the sense and the capacity to perceive are the formula or capacity of the sense organ. They are, in the terminology of Chapter 2, inextricably enmattered capacities, not extended bits of matter.

Aristotle, at this point, clarifies his earlier talk of the sense being affected *in accordance with the account* (424a23ff.). The sense organ is affected by the object in the world in accordance with the formula which makes it that sense. It is affected, that is, in the way required for the object in question to be perceived as, for example, hot or cold. Since perception essentially involves discrimination, his idea can be summarized as follows: the sense organ is affected in the way required

[63] Victor Caston (2005: 306) has suggested an alternative reading of this passage. It runs as follows:

> Perception of each special sensible suffers from each of what has colour, flavour or noise, not in so far as each of those things is said to be coloured, flavoured but in so far as each is a given type of thing, one understood as in line with the relevant proportion (*hē toiondi kai kata ton logon*).

This reading has several disadvantages: (i) it introduces talk of 'proportion' apparently out of the blue, with no immediate contextual support; (ii) it breaks the parallelism between each of these things (what has colour and flavour) and gold or bronze in the previous line (424a21): one would expect 'each of these things is said to be' to specify the object/matter that has the colour etc. not the fact of its colour which appears to be captured by 'as such'; (iii) it understands the phrase 'and in line with the relevant proportion' as explicative of the type of thing just introduced *(toiondi)*: being such that is in line with a given proportion. However, since I have not been able to find a parallel use of the Greek expression '*toiondi kai*' introducing a new kind explicated by '*kai*' (understood as 'that is'), it seems preferable to take 'such (*toiondi*)' to refer back to being coloured or flavoured and to understand the expression '*kai*' to mean 'and' and to introduce a further claim.

for the perceiver to discriminate the object in question. The determinate type of affection is defined as the affection of a sense organ with this capacity. It is the essentially embodied activity of a similarly inextricably embodied capacity.

If this is correct, the way that which is in the mean state (viz. the sense organ) is active will be precisely that required for the sense (or better the perceiver) to perceptually discriminate the object in question. Indeed, definition of how the former is moved (way A) must involve reference, in the definition, to the way required to discriminate the objects at issue. There are movements in the relevant organ when we perceive but these are defined in terms of the goal of perceptual discrimination. In any particular case, there will be one physical process in the sense organ (analogous to wax being imprinted) which is also a discrimination of the sense object. One cannot adequately specify the relevant changes in the sense organ except as the ones required for discrimination of the relevant objects. If there were a type of physical change which resembled this one in some (perhaps many) physical respects but did not serve the same goal or engage with the same perceptual capacities, it would be a different type of change. As in the case of anger, one and the same process is essentially and inextricably a psycho-physical change.

The remainder of *De Anima* B.12, when seen from this perspective, tells a coherent story. Aristotle first draws an immediate consequence from his suggestion that the sense is a capacity of the sense organ:

> It is clear from this why excessive sense objects destroy sense organs (for if the process is too strong for the sense organ, the formula—that is the sense/capacity—is destroyed, just as the harmony and attunement [of the strings] is destroyed when the strings are hit too strongly).

If the sense is the defining capacity of the sense organ, the sense organ will be destroyed if the capacity is destroyed. For the sense organ will cease to exist if it loses its capacity to perceive. In this passage, Aristotle calls attention to the fact that there is one process *(the* process: 424a30) which is both too strong for the sense organ and destructive of the sense as there is one process which is a too heavy hitting of the strings and is destructive of their harmony (their ability to mix high and low notes) and attunement (their ability to hit the correct note). In the former case, there is one process which is both a physical (a strong hitting) and a psychological change (destroying the capacity to perceive/discriminate). This is precisely what we would have expected if (as has been argued) in the normal (non-destructive) case there is one process which is inextricably both a physical change (the mean being moved in a given way) and a case of perceptual discrimination.

Aristotle suggests that excessive (too strong) blows destroy the sense organ because they destroy its capacity to perceive (as excessive blows destroy the strings because they destroy their capacity to play notes). But what counts as an

excessive blow? In the present context, it is one which destroys its capacity to see (play the notes). The relevant characterization of the physical blow (as too strong for the sense organ) will depend essentially on the psychological effect it has (as when destroying the capacity to perceive). Here, as in the case of normal perception, the physical description of the impact of the blow on the sense organ is inextricably connected, in definition, with its psychological impact.

Aristotle draws out a second consequence of his view as follows:

> [It is also clear] why plants do not perceive, although they have some soul-like function and are affected by the objects of touch (for they are heated and cooled). The reason is that they lack a mean, the type of governing feature which can receive the objects of sense. Rather they suffer along with the matter. (424a32–b3)

Plants cannot perceive because they lack a mean. Their lack of a mean does not consist simply in their lack of an ability to perceive (for, if so, there would be no explanation). Rather they lack the type of sense organ that can (e.g.) register heat without its relevant material nature being changed. That is, they lack the type of organ which, while remaining materially the same, can respond to the heat of the object. As a result, they cannot perceive heat (even when they are heated). However, while the type of organ has these physical aspects, it is defined as 'that material organ which can receive the objects of sense', using terms which refer to its psychological role. Nor should this surprise us if Aristotle holds (as suggested above) that the mean's moving in these ways just is, in the inextricably psycho-physical way suggested, our discriminating the relevant sense objects. In the present case, the organ is moved materially in just the ways required for us to perceive heat and cold. Plants, by contrast, when they get hot or cold, 'suffer with the matter'. Since they lack a mean of the relevant type, the impact a hot object has on them is simply to change their material nature (as that of wax would be changed if heat melted it). They become in some material respect more like the object that heats them (e.g. in heat).[64]

These remarks suggest a convincing interpretation of Aristotle's closing remarks in B.12:

[64] This understanding of this passage does not commit Aristotle to either of the following claims:

[1] plants actually take in warm material from the sun when they suffer with the matter; for they could suffer in this way if the sun induced a material change in them, one that altered their matter (as in an ordinary *alloiōsis*);

[2] we, in perceiving, receive the Form without receiving any material bearer (from the medium); for while the Form may not change our material nature, it may call into play its capacity to see (a special kind of change marked out in *De Anima* B.5, 417b15–17).

For an alternative view of this passage, see Burnyeat (1992: 19–24). His interpretation of this and other aspects of *De Anima* B.12 is convincingly criticized by Stephen Everson (1997).

> Tangible objects and flavours affect lifeless objects and change them . . . and indeed even smell and noise affect some lifeless objects too . . . but not all: smell affects air for example. What is smelling beyond being affected in some way? Or is it that smelling is perceiving, while the air is affected quickly and becomes perceptible? (424b12–21)

The crucial difference, to which he draws attention, between smelling and the way the air is affected is that the latter (like other lifeless things) lacks a mean: a physical organ of the type required for perception. Air lacks a definite nature (424b15) and is easily moved. By contrast, the sense organ (in the case of smell) is enclosed and, as such, can retain the air in place long enough for it to be smelled (422a2–3). These features, the presence of the mean and the relative persistence of the smell in the enclosed air there, are essential for this type of perception. Our smelling an object is for our relevant mean to be materially affected by something retained in the air in the nostrils. Smelling, so far from being a purely psychological activity of perceiving, is defined in terms of the inextricably enmattered capacity of the relevant sense organ (with its mean) to be affected in such a way as to discriminate the smell in question. There is, as in the case of tactile perception, an essentially psycho-physical activity to which defining physical and psychological elements inextricably belong.

Throughout this discussion, Aristotle treats receiving the form of the object without its matter as the same activity as the sense organ being affected materially by the form of the object. Tasting is a unified inextricably psycho-physical type of activity: it is the activity of one psycho-physical capacity of the relevant sense organ. Smelling is another. Touching another. This activity in the sense organ is the same activity as its being likened (or made similar to) the relevant property of the object sensed.[65] It is an example of the distinctive type of [Type 2] suffering which perceiving turns out to be. There is no need to, and reason not to, postulate an underlying [Type 1] purely material change in the sense organ to do justice to Aristotle's account of tasting, smelling, and touching. No such definitionally distinct kinds of change occur.[66]

[65] I rely at this point on my discussion of the 'likening' involved in perception (2000: 112–18). It should be noted, however, that in that discussion there are suggestions of my earlier two-component account which I now reject (as when writing of a change in the eye-jelly as 'a physiological change' occurring 'as well as awareness of an object' (p. 117). For a helpful, and congenial, discussion of the relation between receiving the form without the matter and being made like the object, see Hendrik Lorenz (2007: 179–220).

[66] This is why there is no need to answer the further question raised, but not addressed, by Lorenz in the final section of his paper: how are two such kinds of affection related to one another (2007: Section 3)? This is, if I am correct, a pseudo-question which Lorenz wisely did not attempt to answer.

4.12 Interim conclusions

Aristotle, I have argued, developed an account of tasting, smelling and touching as inextricably psycho-physical phenomena, which provides a way to interpret his summarizing discussion in *De Anima* B.12. He did not accept either of the post-Cartesian assumptions, [A] and [B], set out in Section 4.1. In fact, he rejected both, understanding the relevant psychological and physical features as, in the ways explained, inextricably psycho-physical. In his simple theory of these phenomena, they have to be defined as inextricably psycho-physical (and possessed of forms of this type) to be causally produced in the way they are by flavours, smells, and the impact of hot, heavy objects.

Did he apply the same style of account to hearing and to seeing? While we should expect a positive answer to this question on the basis of his generalizing remarks on perception in *De Anima* B.12, I shall seek to confirm this impression by considering the details of his discussion in Chapter 5.