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Abstract

This chapter gives an overview of some key themes in the early theories of sense perception. It covers early Greek theories (in particular those of the so-called Presocratics), Plato, Aristotle, and the early Peripatetics (Theophrastus and Strato). The comments on these first attempts at theorising senses come to us through the filter of Peripatetic reporting, which can be a challenge to their interpretation. In addition, it is argued that one can, to a degree, detect an increasing sophistication in the theoretical reasoning on the mechanism of sense perception. Finally, where possible, the chapter questions the standard hierarchy of the senses and highlights unusual cases of multisensory observations. The chapter provides the intellectual background for underpinning sensory studies of the ancient world, not just archaeology.

Introduction

The first attempts at a theoretical understanding of the senses are recorded among the early Greek thinkers in the sixth and fifth centuries BCE. Among a flurry of rationalistic thought experiments, broad theories about the workings of the cosmos soon turned their gaze to the *interaction* between humans and their environment, between ensouled sentient beings and the animals, plants, and 'dead' objects around them. These early attempts at clarifying and explaining how humans see, hear, smell, taste, and touch anything not only show what a rational perspective can do, but also offer an intriguing glimpse of the ambition to reach a generalised understanding of this highly subjective experience of sensory perception.

Considered views on sensory experiences from the ancient world are among the most difficult representations to interpret: we are faced with particular challenges of complex evidence, a problem of access to the actual sensory affections, and the fluid and variable language across periods and schools of thought. Relevant material ranges from the fragments of the early Greek philosophers (*c.* 625–*c.* 400 BCE; fragments collected in Diels and Kranz, 1959 and Laks and Most, 2016), to Plato (428–347 BCE) and Aristotle (387–322 BCE), who both have quite theoretical perspectives and are both sources for the earlier thinkers, to the famous Hellenistic schools of

the Stoics, Epicureans, and Sceptics. The *nature* of sensory experiences themselves also poses special challenges. Not only are they now disembodied and distant, but the descriptive terms and underlying concepts are also often intricate, and we have trouble determining to what extent the scope of recorded instances of seeing, hearing, or smelling (by choice or by chance) coincides with the *actual* range of sensations.

These three issues (access, language, subjectivity) perhaps suggest limited opportunities for reconstructing theories about sensory experiences. As serious as these limitations are to our inquiry, we should not consider them insurmountable obstacles to probing the question of how the ancients *expressed* their sensory experiences in a more theoretical form. In this chapter, I will give a selective overview of the concerted efforts to describe and explain perception in the writings of Greek philosophers. To do so within the context of 'sensual culture studies' will also require a focus on aspects relevant to this new field. One question we must ask is whether we can avoid misrepresenting the evidence or superimposing modern criteria. I will deal with this methodological challenge intermittently since it is of wider significance for the volume as a whole, but first I will tackle a more fundamental point.

The focus on the Greeks as the start of the 'Western Tradition' in this chapter might seem incongruous with the aims of 'sensual culture studies': the ancient Western tradition generally represents precisely those traditional aspects which this new trend is reacting against (Day, 2013). On the face of it, the evidence is indeed based on such positions as the body–mind division, the five senses as paradigmatic, and a preference for the sense of sight. But on closer inspection we will find things are not quite that simple, and that we can make certain qualifications. While many sources seem to adhere to (some form of) the body–mind division, assume the five senses as standard, and stipulate the primacy of sight, we also find a few divergent views as well as intriguing signs of aesthetic, subjective, and qualitative evaluations of how physical objects affect the senses. The chapter falls into four thematic sections: a general account of the various observations on perceptions; an analysis of the significant evidence for principles of explanation; some novel aspects of sense perception; and an epilogue with the broader implications of this new approach.

Making sense of the sensorium

The literature of the Archaic period of ancient Greece (750–480 BCE) is typically pre-scientific in its description of sensory experiences: there is no causal reasoning, no attempt at building a theoretical system, nor does it separate out the individual sense domains. But there are some intriguing signs of multisensory observations. Homer's descriptions of war, conflict, and family life tell us a lot about the various sensory impressions, without causal explanations. These and other writings on war scenes and domestic events reveal a rich palette of colours, odours, flavours, and tactile moments: red and warm blood; noisy and physical collisions; the smell of burning wood, meat, and flesh—these all contribute to the tumultuous atmosphere and quotidian impressions of the era. The mode of expression, however, is usually non-theoretical, even if literary metaphor allows for going beyond sensory experience.

By contrast, early Greek philosophers proposed detailed and highly theoretical constructs to explain perception (I refrain from using the term 'Presocratics', see Laks and Most, 2016). They characteristically express a more empirical outlook and rational aspirations to explain. Important thematic issues that dominate the debate on the senses were their *hierarchy*, their *mechanism*, and their *reliability*. The hierarchy is initially not broached explicitly (I will come back to this), but resolved in clear terms by Aristotle and then canonised. The mechanisms they favour make use

of two crucial notions: contact and compatibility (Baltussen, 2015). In other words, perception is almost without exception the result of direct contact and assumes a certain affinity between sense organ and its particular object (eyes and images; ears and sounds; nose and odours, etc.). The cause for the affinity is never properly explained, but it is often a matter of 'fitting'. The claim that only compatible stimuli are registered by the *appropriate sense* must mean that they assume that our senses are assailed by various stimuli all the time, which are not registered (some may enter but remain undetected, as Theophrastus notes at *On sense perception* 7).

Aristotle's investigation into the deeper meaning of reality (a work now known as *Metaphysics*, though he called it 'first philosophy') opens with the claim that all humans want to know and consider sight the most important sense organ (*Metaphysics* A, 980a21–27). Modern linguists have argued that the link between seeing and understanding is embedded in the Greek language, from the roots of special verbs (Gr. ϝειδ-/ϝιδ-/ϝοιδ-) to their later usage, so that verbs 'know' and 'understand', such as εἴδω, incorporate the same root.[1] One may speculate that hearing came second on account of its complementary role to sight. For example, seeing an orator perform (facial expressions, gesticulations) is crucially aided by hearing what an orator says. Only together will sight and sound convey the full impact of his message. In this sense the primacy of sight and hearing would seem determined by pragmatic, not ideological reasons. For philosophers the matter relates more to precision: sight offers the greatest degree of detail in the information it provides, while hearing is closely related to words and meaning. Thus, visual and semantic accuracy seems the main reason for their important status.

A general pattern among early thinkers relates to their basic explanatory principle, which played a role in their wider study of nature and humanity (clarified in detail in Baltussen, 2015). Our main source for the earliest views on sense perception (and sense objects), Theophrastus' *On sense perception* (*De Sensu,* short *DS*), sums up the basic principles of explanation as being of two kinds (*DS* 1–2) to do with the relation between organ and object: perception works by similarity (Empedocles, *c.* 495–430 BCE) or by contrast (Anaxagoras, *c.* 500–*c.* 425 BCE).[2] In this Theophrastus no doubt follows Aristotle, who also uses Empedocles and Anaxagoras to create two types to clarify the soul's role (*On the soul* 416a29). This convenient dichotomy is imposed on the earlier theories and suggests that Empedocles and Anaxagoras framed the causes and mechanisms of the senses with one fundamental principle. But the model is rather reductionist, and while convenient, receives some qualifying corrections in the later parts of the *DS*. For example, Theophrastus reveals that not all earlier thinkers fit the dual causes of similarity and dissimilarity, since individuals such as Alcmaeon (*c.* 500 BCE) and Clidemus (*c.* 475 BCE) seem to have been 'appended' to Empedocles and Anaxagoras respectively (*DS* 25–26 and *DS* 38) neither of whom made a clear claim for or against any principle. Moreover, the fact that the material is mediated via Peripatetic paraphrase should put us on our guard for possible distortions. But overall, we get a fairly good impression of the detailed accounts of the early Greek philosophers and their efforts to provide a theoretical grounding for the workings of sense perception. Philosophical, literary, and medical writers all contribute something on this topic, but that would require a much broader study than the present scope allows.

The *terminology* they used reflects a general perspective on perceptive processes. Terms like *aisthêsis*, normally translated 'sense perception', offer an added affective aspect, which we may render as 'awareness, feeling'. The word is post-Homeric and its cognate verb is *aisthanesthai* (Solmsen, 1961; Kahn, 1966). Similarly, the nouns *pathos* and *pathêma* capture a wide range of experiential affects which are not so easily translated into English: 'experience, feeling' are possible translations, but so are 'pain' and 'affect'. The various points the early Greek thinkers raised also include the relation between perception and understanding (e.g. reliability of the senses, see

later), the 'attunement' between object and perceiver, and the role of pleasure and pain in the process of perception.

A further point of interest is that most Greek philosophers agree that perception is 'non-rational', that is to say, the impact of the object on the observer happens mechanically (without intention or agency). This is pertinent for the question when exactly the perceptive moment occurs and how and where this information is processed. The question leads to the search for a central sensory faculty which synthesises and *interprets* incoming stimuli. But we find little on this question, at least explicitly, until Plato in the fourth century BCE (e.g. *Theaetetus* 184d), with the possible exception of Clidemus, who wanted sounds to be sent on (*diapempein*) to the mind for judgement (*krinein*, *DS* 38) or the philosopher-physician Alcmaeon (*c.* 510–*c.* 450 BCE), who is the first to hold the exceptional view that the brain is the centre of sensation: 'all the senses are connected in some way to the brain' (*DS* 26; Aristotle, *Inquiry into Animals* 495b6, 516a8). Aristotle addresses the point explicitly.

Among the writings known to us, but not all extant, many concern physiological phenomena associated with sensory experiences, such as emotions, sleeping, dreaming (Aristotle); sweating, dizziness, and fatigue (Theophrastus; Diogenes Laertius 5. 44, see later), which include all kinds of hints about the multisensory aspects of these bodily experiences. Typically, emotions in the sense of anger, fear, joy, and sadness are often discussed in the context of rhetoric, since they perform primarily a social function, in the context of the multisensory human experience described earlier. Thus, Aristotle discusses the emotions in *Rhetoric* Book 2 under deliberative oratory in order to 'put his hearers in the right frame of mind' (2.1, 1377b20–25). In rhetoric and history these were considered essential in both conveying and receiving the message. The historian Polybius (2nd c. BCE) declared the eyes and ears crucial for historical reporting and describes them as 'most accurate and truthful' (*Histories* 12.27.12; 28a.3–5).

Five senses?

As to the number of senses, Aristotle may well be responsible for determining that five senses can serve as sufficient for capturing our sensory capabilities (Sorabji, 1971). As late as the sixth century CE, Platonist commentators assumed that he adhered to a set of five senses and no more (e.g. Prisician of Lydia, *Paraphrase of Theophrastus' Discourse on the Soul* 1.42 Bywater: 'Aristotle believes that there are no more senses because of the fact that all things are perceptible by us'). But as I indicated earlier, when he and Theophrastus summarise the views of their predecessors, they are imposing a hierarchy which partly misrepresents the views of their predecessors. It is especially in Theophrastus' reports that we can find traces of a divergent hierarchy in some of the earlier Greek thinkers. For instance, he reports that Alcmaeon spoke of the senses individually, and Theophrastus opens with hearing, then smelling and tasting (*DS* 25), and only then discusses the eyes and seeing. While this latter move may be a deliberate rearrangement (e.g. to leave the most important to last), Alcmaeon also comments on the sense organs in some detail, identifying the transparent (or 'gleaming', τῷ στίλβοντι) of the eye as crucial for the process, and remarks that the tongue discerns tastes because it is 'warm and soft', hence able to 'dissolve [substances] with its heat'; last but not least, 'because of its loose and yielding texture it readily receives and transmits [savours]' (*DS* 25). While Alcmaeon apparently said nothing on touch, he clearly was aware of the tactile dimension of taste ('loose and yielding') and made good use of it.

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Smell is an intriguing and enigmatic sense. In a very Homeric vein, Heraclitus (fl. 500 BCE) is supposed to have claimed that 'souls have [a sense of] smell in Hades' (fr. 111 Kahn = 22B98 DK[3]). His concern about what happens to us after death is certainly a reasonable one, if only to

show that sense perception is recognised as a sign of life—implying that the soul is in an after-*life*. For Diogenes of Apollonia (fifth c. BCE) Theophrastus focuses on smell first and foremost, probably because Diogenes' primary (physical) cause for many perceptive processes is air (*DS* 46). As a result, the report uses the sequence hearing–sight–taste; touch is not mentioned (for details, see Baltussen, 2000, pp.178–185). The rigour of the model is also evident in the fact that Theophrastus makes it clear when any of the predecessors omitted to comment on one of the five senses. He saw such an omission as a flaw, thereby imposing the need for an account which included *all five* of the senses. These examples strongly suggest that the Aristotelian hierarchy of the senses was influential but that it cannot be taken for granted in earlier philosophers.

Perception and thought

Another issue of general import is the link between perceiving and thinking (Caston, 2015). The earlier thinkers had trouble providing a solid foundation for knowledge, while they understood there was a close relationship between perception and thought. Anaxagoras claimed 'through the weakness of the sense-perceptions, we cannot judge truth' (B21 DK). Both Aristotle and Theophrastus inform us that this link was a recurrent item in early discussions. Compared to the influential Cartesian paradigm of a strict body–mind division in modern times, their remarks suggest that the early thinkers inquired whether there was some kind of deeper connection between body and mind, which might even lead to psychosomatic effects. Aristotle criticised Parmenides for declaring perceiving and thinking identical (Aristotle *Metaphysics* IV. 5; similar Theophrastus *DS* 4). Moreover, Empedocles is said to have made thought most perfect in the blood, because the blood contains the most perfect blend of the four elements (*DS* 10 = 31B107 DK). Theophrastus cannot accept this view, since, according to him, some animals are bloodless which would imply they do not think (*DS* 23). In all these cases the mental and physical are closely connected.

Individual senses

When we now consider specific sense organs and how their mechanism and effects are expressed, we should perhaps differentiate between the Aristotelian exemplar and what the evidence tells us about views diverging from this model. The earliest thinkers dealt with the functions of the senses on the basis of everyday observation. The sixth and fifth century philosophers formulated bold speculations as to how we should explain processes which were assumed to operate below the perceptive level (Beare, 1992, pp.4–5; Lloyd, 1973, pp.8–15). The importance of sight and hearing was already mentioned. It is significant that Theophrastus, our most important source for pre-Aristotelian theories of perception, only deals with sight and hearing for many of the early thinkers. It would seem that his criterion for a good theory, consistency in explanations offered (*DS* 13, 15, 18, 49, 51, 59, 92; cf. *On odours* 64) (on consistency, see Baltussen, 2000, pp.25, 168f., 202–204), leads him to shorten his account, once he finds the relevant evidence, thus foregoing a comprehensive account of the details. In the case of Democritus (*c.* 480–430 BCE) he will not go beyond the explanation for sight and hearing, commenting that 'for our other senses, his treatment hardly differs from that of most others' (*DS* 57; 'most others', see *DS* 1–23). Democritus' keen interest in perception is clear from titles of writings which consider colours, tastes, and perception in individual works (68A5f-h DK).

For the mechanics of vision, two main ideas are favoured before Aristotle (Theophrastus, *DS* 1): either effluences come from the objects (intromission, e.g. Empedocles) or the eye reaches out for objects (extramission; e.g. 'visual rays' in Plato). Given the speculative nature of their

theories, early thinkers like to use similes and analogies. Thus, Empedocles employs the simile of the lantern (31B100) to elucidate his explanation of vision: light shining out into the world to establish contact (on this passage see also Sedley, 1992 and Ierodiakonou, 2005). He also makes everything (even soul) consist of the four basic elements, and 'symmetrical' effluences (*aporroai*) from bodies to fit into pores (*poroi*) of their corresponding organs, thus explaining how sense objects relate to the right organ, e.g. fire particles (probably white objects) are perceived by the fire in the eye (31B109 DK; Beare, 1992, pp.4–5). He is also keen to point out that that two eyes still produce one image (31B101 DK). Problematic is Democritus' claim that images (*deikela*) retained the *whole* size and shape of objects so that Theophrastus can rightfully rebuke him for omitting to explain how they then fit into the eye. Clearly these suggestions are a blend of bold speculation and sound observation. The increased analytical perspective seems to deflect from making comments on multisensory experiences.

Other sense organs are less well served by the evidence, although hearing gets considerable attention. It is explained as a process by which air hits upon something solid. Empirically it made sense to assume, as Empedocles did, that solid materials can resound from impact: after all, we can 'feel' sound as the reverberations in the air and in objects as well as in our bodies. According to Empedocles, the inside of the ear resounds 'like a bell' (*kôdôn*, 31B99 DK) (for this term, see Baltussen, 2006). Smelling is, according to most, connected to breathing: Empedocles links it directly to breathing (31B102), while Diogenes of Apollonia assumes a special relation to the brain. For the other thinkers, Theophrastus does not provide much information. For taste, they seem to focus mostly on individual flavours rather than give a general explanation (see Rudolph, 2018). Theophrastus even combines Democritus and Plato in a separate discussion of *Causes of Plants* 6, juxtaposing and comparing their accounts as if they offer two contrasting types on the opposites ends of a scale.

The question of reliable perceptions is central for philosophical inquiry, given its importance for attaining secure knowledge. This type of question was a much-advanced one compared to the Homeric outlook because it showed an awareness of the *possibility* that perceptions might not be trustworthy. Parmenides (*c.* 550 BCE) was the first to declare the senses unreliable (28B7 DK), radically rejecting an empirical approach to learn about the world. His emphasis on logical thought (28B8 DK) led to strong doubts about the veridical status of sense impressions. Some thinkers after him rehabilitated the senses, on the condition that they are judged by the mind (Empedocles 31B3 DK; Heraclitus 22B55, 107 DK). In broad outlook Empedocles was less pessimistic than the sceptical rationalists (31B3):

> and do not hold any [percept of] sight higher in credibility than (*those*) according to hearing, nor (*set*) the loud-sounding hearing above the evidence of the tongue (*taste*); nor refuse credence at all to any of the other limbs where there exists a path for perception, but use whatever way of perception makes each thing clear.
>
> *(tr. Freeman, 1946, modified)*

This ongoing debate on the reliability of the senses was informed by a detailed analysis of the senses (*aisthêseis*) and their objects (*aisthêta*). Empedocles already distinguished between what can be understood by the mind and what with the sense organs. When he speaks of the two 'binding forces' of the universe, Hate and Love (i.e. separation and attraction), he exclaims in enigmatic fashion: 'Observe her *with your mind*, and do not sit with wondering eyes!'

But Democritus added another level of complexity, expressing a sceptical view about perceived objects and their underlying 'truth'. He famously claimed that the labels we use to

describe our impressions, like 'white' or 'sweet', are merely conventional. Hence his analysis derived these are 'secondary' qualities derived from the primary qualities of the atoms and the void (68B9-10 DK). Adding this speculative layer of the world meant that Democritus separated perceived reality from true reality, the atoms: further subdivision of matter was not possible (they are *atomos*, 'uncuttable' or 'indivisible'). Interestingly, a passage in a handbook of philosophy dated to the early Roman empire (Aëtius' *Placita* IV.10, 4 [Diels, 1879, p. 399] = A115 DK) suggests that he believed some sense objects escape our notice (*lanthanein*). While Beare (1992, pp.206–207) is not convinced that this text should be read in this way, it shows that this kind of question (is there full coverage of sensible objects?) was not unknown to early Greek thinkers.

Plato's metaphysical focus

Plato gave perception a very limited role in his philosophical theory, often voicing strong reservations about its value for acquiring knowledge (*Theaetetus* 186d; *Phaedo* 66-68, 73–76; *Republic* 476; 523–524). His emphasis is on limitations, not on total lack of reliability, and like Parmenides he gives rational thought the more important role of 'interpreting' empirical data, which are derived from, and reminders of, a higher metaphysical reality (Forms). Nevertheless, in his cosmological work *Timaeus* he does present a theory of perception, ingeniously synthesising existing models to create a whole new theory (e.g. using Empedocles' four basic elements, but also speaking of triangles as 'atomic' constituents of physical objects at an unobservable level, inspired by Democritus). Yet in his view, sight and hearing have primarily a teleological role, i.e. they were intended to observe the universe and understand its order (*Timaeus* 45–47).

He describes vision as a fusing of fire from the eyes (visual ray) with its like outside (*Timaeus* 45b3-d2; *sunaugeia*, Aëtius IV. 13, 11). Hearing, taste, flavours, smells are described (touch is not a separate sense), as is the conventional nature of our language for them (another Democritean echo). Sense objects lack permanence—they are, he seems to suggest, fleeting impressions visible in the 'receptacle' (probably space or place). The 'receptacle', a rather enigmatic and much-debated entity, 'receives' objects like a mirror does images. As is clear, this account contains several early attempts at articulating abstract notions like impermanence, space, and physical change.

According to Plato, the relative size *and mobility* of particles determine their effect on the senses (53b–55c). His descriptions of their impact are vivid and convey a sense of the empirical experience behind it: when we burn ourselves, it is caused by the sharp edges of the small triangles (56a 'when we assign the smallest body to fire, and the greatest to water, and the intermediate to air; and again, the first in point of sharpness to fire'). The soul, the agent of life and centre of cognition, uses the body as an instrument, so that cognition depends on the body. This means our soul is confused because of the sensory impressions it has to cope with (*Timaeus* 43b–e). Plato's account falls short of describing the soul as a central synthesising entity, but then he was not primarily interested in the physical world.

Peripatetic perceptions

Aristotle (384–322 BCE) and his successor Theophrastus (*c.* 371–287 BCE) did not simply follow the existing tradition, but critically selected from, and reframed, the approaches to perception. And because their view is far more systematic and comprehensive, their account combines methodically gathered empirical evidence with complex theoretical considerations: strikingly, sensation (and psychology) are framed as part of physics, because they also belong to the realm of

motion and change (like Plato, they held that the soul is a self-mover). In their understanding of the world, a major dividing-line separates animals ('ensouled beings', *empsukha*) from inanimate objects ('soulless', *apsukha*). As a result, the former can be defined by sensation and soul (*On the soul* 433b30; 434a30, b7–8), a superior class of entity in charge of everything else in the world (creatures and objects). Aristotle also introduced some novel technical notions which might explain the changes we observe (or believe to observe) in objects. In the briefest possible terms, one could put it as follows (fuller summary account in Baltussen, 2000, pp.74–79):

> The process of sensing involves motion(s) bridging the gap between organ and object (*On the soul* 413b21-23, cf. *Physics* 244b5-245a11). They start in the heart, which is the centre of the sensory/perceptive abilities (*On sleep* 456a6). In the course of perceiving, the object and the organ (which are potentially alike) are brought together so that in the act of perception these become actually alike. Aristotle had thus succeeded in combining the two principles existing before him (like-by-like and contrast) into one explanatory description through the concepts of potentiality and actuality, and the idea of a permanent substrate which acquires and loses qualities.

In his analysis of change he proposed to introduce the notions of potentiality and actuality (e.g., an acorn is potentially an oak tree) to explain developmental change. When we see change, Aristotle suggests, the focus should be on what kind of change it is; the perceptive process informs us about superficial and temporary change (e.g. a tan) and more permanent ones (becoming an adult). Understanding what is going on requires us to assume that there is something underlying the change that remains stable (the permanent and the passing, or as he puts it, the substance and its attributes). Only then will we not become confused about phenomenal illusions and misleading impressions; we will be able to detect what is really going on. Note how this model also takes care of Democritus' concerns about 'secondary' qualities not representing the true nature of an object.

Theophrastus, successor to Aristotle

Theophrastus adopted much of the Aristotelian theory and developed it, expanding details and coherence as well as exploring associated areas.[4] We do not have *one* work informing us about his views on perception, but he wrote a few separate tracts, such as *On Vision* (περὶ ὄψεως, DL 5. 49, not extant) and *On Odours* (περὶ ὀδμῶν). In addition, the Aristotelian works can assist in filling in gaps. He probably thought there existed a certain kinship between object and sense organ (Priscian, *Paraphrase of Theophrastus' Discourse on the Soul* 15.25–26 Bywater = fr. 277B FHSG), but also makes use of Aristotle's notion of the two becoming alike (potentiality actualised, ibid. 1.3–8). In outline, his account of the individual senses is as follows. Colour is brought to the eye *via* light, because light is the activity of the transparent and the 'vehicle' of colour. In the process of vision, the disposition of the organ is of importance, as is the transparent, which is 'its matter'.[5] Seeing an object, i.e. perceiving colours and common features of sense objects (form, size, motion), occurs when the visible object reaches the eye and produces a qualitative change in the eye. In smelling, which can occur without breathing, the air becomes mixed and 'in a way affected' (Priscian *Paraphrase* 14.10-12 Bywater = fr. 277A FHSG]. Cf. Theophrastus *On odours* 9; 10; 45). In hearing at least three stages can be distinguished: first a blow (a necessary element of the process, 16.14–15 Bywater) occurs which shapes the air near the ear (14.10–12 Bywater)[6]; next the movement is passed on through the medium of the outside air to the air inside; and

finally the movement is interpreted by the sensitive part of the soul. A fascinating detail confirming the general description given at the start relates to the role of hearing in emotional responses: in rhetoric hearing is closely linked to emotion (fragment preserved in Plutarch's *Listening to Lectures.* 37-38 = fr. 293 FHSG). Taste and touch receive a separate treatment because of the special problem of how to understand these more direct forms of perception and their medium (Priscian, *Paraphrase* 7.20–28 Bywater = fr. 275A FHSG).

It is clear that the mechanics of perception by now received a more comprehensive and sophisticated treatment. But Theophrastus' in-depth study of particular areas is even more intriguing. His special interest in tastes and smells is clear from the work *On odours* (Eigler, 2003), many titles in Diogenes Laertius' list of works (5. 42–50), and the long passages in the botanical works, especially his discussion in *On causes of plants* book 6. The views he sets out in *On odours* are quite sophisticated: he knew about the close connection between tastes and smells, while smell depends, according to him, on a mixed nature of the sense data. The empirical origin of many of his observations is very obvious: for instance, he speaks about odour in plants (2), wine and flowers (3), perfumes (in oils) (4–6), and spices (7). He also considers degrees of intensity (adjectives such as weak, pungent, sharp, fragrant, etc.) For our purposes it is of particular interest how, in his view, some smells can impact on humans in a serious way, and influence health. Theophrastus reports that 'headache is caused by sweet marjoram spikenard and *megaleion* among costly perfumes' (*On Odours* 10). Moreover, there is a gendered aspect, when he mentions (ibid.) that:

> The best for women are myrrh-oil, *megaleion*, the Egyptian, sweet marjoram, and spikenard: for these owing to their strength and substantial character do not easily evaporate and are not easily made to disperse, and a lasting perfume is what women require.

Special attention is given to rose-perfume which, despite its delicate nature, seems to be able to overpower other odours:

> The explanation is that, being very delicate and acceptable to the sense of smell, by reason of its lightness it penetrates as no other can and fills up the passages of the sense, so that being entirely taken up and filled with it, it is unable to judge of others.
>
> *(11)*

He also refers to the sexual powers of odours in animals, in particular the goat skin (13).

Other relevant works deal with physiological phenomena such as sweat, dizziness, and fatigue. There is little known about earlier views on fatigue. Assuming a mind–body dichotomy of some kind, Anaxagoras had declared fatigue a bodily affect, *sômatikon pathos*, not a mental one, *ou psukhikon* (Aëtius, *Opinions of the philosophers.* V. 25, 2 [Diels p. 437] = 59A103 DK). Alcmaeon apparently commented that fatigue was one factor among several which could influence health, which he viewed as a balance of the basic elemental qualities (wet–dry, hot–cold, etc.; Aëtius V, 30.1 = 24B4 DK). Theophrastus' short works are now available in a recent edition (Fortenbaugh, Sharples, and Sollenberger, 2003). They reveal some interesting details about embodied experiences which would qualify as multimodal perception. A few salient points may be highlighted here to illustrate this.

In *On Sweat* (*peri idrōtōn* D.L. 5.44) Theophrastus sets out his views on the nature, occurrence, and reasons of this physiological phenomenon. In §2 he notes that 'sweat is salty because what is foreign to the nature of flesh is secreted, after what is sweetest and lightest has been

consumed'. This claim incorporates a range of assumptions, but what immediately strikes us is the fact that sweat is characterised by taste (salty). In §5 he also mentions that sweat may have a bad odour (e.g. acidic), which he explains as the lack of 'concoction' (a process of reducing fluids resulting from heat). He also observes that bad odour occurs in sports and sexual activity (§7), and both more in adolescents than older men (no women here; §8). Temperature also plays a role: he distinguishes hot from cold sweat. There is a strong suspicion that this set of notes in 40 short paragraphs was based on a study of athletes especially, since the examples are as a rule about running and exercise, while at §11 the text quotes a trainer (*gymnastês*) called Diotimus, who said that 'there are some three varieties of sweat, beginning, middling and ceasing'.

The short tract on dizziness (perhaps the same as *peri illingôn kai skotôseôn*, Diogenes Laertius 5. 44) offers various explanations for dizziness, one of which involves 'movement of the sight' (§7). Examples of this kind include sailing (observing the movement of the waves and stars), looking at swings and wheels, and vertigo (looking at high or steep things). The last case is especially interesting, as it involves the notion of extramission: 'because it happens that their sight, *stretched out* to great length, is shaken and vibrates, … moves the inside parts' (§8). A last example worth citing is the claim that 'giddiness also comes about when people look continuously at the same thing and fix their gaze' (§9). These very short comments reveal an interest in physiological experiences which may include the senses, which is why some of these passages also show up in later medical texts (Sharples in Fortenbaugh, Sharples, and Sollenberger, 2003).

Last but not least, the work on fatigue (*peri kopôn*, Diogenes Laertius 5. 44), something which can be sensed more broadly in the body as well as in the sense organs. The short work offers a few details regarding sensory experience in exertion and possible treatment. For instance, that fatigue can be experienced as 'heaviness' (3.23) is confirmed by what modern athletes experience, but we know that it is caused by 'an excess in lactic acid', while Theophrastus attributes it to 'actual increase in weight of the limbs', understood as a result of accumulated fluid (Sollenberger in Fortenbaugh, Sharples, and Sollenberger 2003, p.262). The experience of fatigue is clearly explained in empirical terms (§4): excretion of fluid (*ekkrisis*) may cause pain or discomfort (*lupê*, *ponos*).

These three short works reveal the wider interest in bio-medical topics among Aristotle's successors.[7] After Theophrastus, Strato also wrote on vision, perception, and colours (Diogenes Laertius 5. 59). They extend the inquiry into very specific aspects of unusual physical experiences which can only be described by pointing to observable behaviours and suggesting *possible* causes. For the latter we find occasional multimodal explanations, since at least part of the experience relates to a more familiar sensory affect such as temperature, weight, or motion—all abstract concepts not associated solely with one specific sense organ (by touching and feeling perhaps). Yet these accounts were taken as contributing to a satisfactory explanation, no matter how much they strike us as implausible. As one reviewer of their 2003 edition wrote, 'the job of accommodating theory to observation looks unnatural, implausible, convoluted, and *ad hoc*—an inadequate theory is being maintained in the face of evidence that should have caused a radical re-think, not just a patch-up or white-wash' (Brennan, 2004).

Conclusion

In this chapter I have attempted to present the various views and theories of perception from the Archaic to the Hellenistic times in order to showcase the main features of the explanations the Greek philosophers offered for sensory experiences. As sentient beings, the Greeks slowly developed ways to express the sensory experiences. The transition from the Archaic to the Classical

period is one that moves from the experiential expression of sensory impressions to a proliferation of bold and speculative theories about all the senses, including fundamental principles underlying these. Most early theories made use of a mechanical and empirical model to explain human interaction with the physical world, based on analogy, which illustrates the relative simplicity of their achievement. Yet the highly detailed accounts (transmitted to us via Peripatetic and other sources) should not be discounted: they show awareness of the richness of the sense data and did not refrain from incorporating them into their explanations. We also detected comments which could be read as multisensory experiences, while growing sophistication led to highly theoretical views on mind and body, their fusion, and other types of sensorial awareness. Theophrastus' reports in his *On sense perception* are especially valuable, because they allow us to tease out various hierarchies of senses in early Greek thinkers, given the hints that suggest different hierarchies (Alcmaeon, Clidemus, Diogenes of Apollonia) and perhaps even divergence from the five-senses theorem of Aristotle. We also saw how occasionally philosophers showed awareness of the multimodal nature of perception, for instance when Alcmaeon described tasting in terms of touch and temperature. The close interaction between mind and body also gave rise to the suspicion that the understanding of this (internal) interaction did not always adhere to a strict dualism, especially with regard to the link between perception and knowledge. Overall, we may observe that the expanding analytical perspective seems to have impeded more developed views on perceptions as multisensory experiences.

This rapid overview has shown how one can detect aspects of the new sensory approach in familiar material. It is hoped that these observations can be of use in the broader field of sensory archaeology, as a reflection on the interaction between humans and their environment, including material objects. Broadly speaking, theories of perception went from the simple experiential views and the theoretical constructs building on these, to a far more methodical empiricism and detailed theoretical stance, showing how everyday observations could lead to more adequate explanations on what we observe and how this leads to knowledge. Aristotle pioneered this new stage, illustrating how the early attempts at explaining sense perception could be evaluated and transformed into more sophisticated and systematic theories. After Aristotle, various sensory phenomena make an appearance when his successors make in-depth studies of specific areas, such as vision, colours, and tastes. But it is the link between perception and knowledge that becomes the particular focus of other Hellenistic schools who became especially interested in epistemology.

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Notes

1 Perhaps no longer in Latin: *vid-* in *vidēre* means 'I see', but differs from *percipere* 'perceive' or *cognoscere* 'learn, become acquainted with' (through perception). Today we still say 'I see', meaning 'I understand'. The linguistic point is made by Snell, 1955, among others.

2 For the short title *De sensu* (= *DS*) see White, 2002, pp.25–26, 29. The only English translation is Stratton's 1964 (1917). For recent analyses of early theories of sight, see: Clements, 2015; Rudolph, 2015.

3 Fragments are cited by the standard edition of Diels–Kranz = DK (first ed. 1922 with many later reprints; I use the 17th ed. reprinted 1989 = 1958). The first number refers to the chapter of the edition

associated with one thinker (Heraclitus is Ch. 68), the letter 'B' to a presumed fragment (not a paraphrase, which receives the letter 'A'), and the final number refers the actual fragment in the chapter. For a modern study, see Watson, 2000.

4 See, for instance, Priscian *Paraphrase of the Books of Theophrastus On Sense Perception,* 7.20–23 Bywater): 'our present project is … to develop a clear statement about … the (views) of T., both *if he adds anything beyond what Aristotle has handed down*, to bring it together, and *if, in raising difficulties, he offers us anything*, to work it out as well as we can' [italics mine; tr. *FHS&G*]. (This section draws directly on Baltussen, 2000, pp.83–86.)

5 The transparent is discussed extensively, see Priscian, *Paraphrase*. I. 17–18, 20–21, 23, 29 [*FHS&G*, 278]; 'Simplicius', *On Aristotle 'On the Soul'* 136.20–29 Hayduck [fr. 279 FHSG].

6 Hearing as a shaping of the air (τοῦ ἀέρου … σχηματιζομένου) is also found in the ps. Aristotelian *On things heard* 800a3–4 where it is criticised—one of the reasons to assume it is not Theophrastean (Gottschalk, 1968, 447–449). It plays a large part in Theophrastus' *On Music* (Fr. 89 W. [fr. 716 FHSG]), but is not found in the *DS*.

7 Since Hippocrates in the mid fifth c., medical theories arose in a fruitful cross-pollination with philosophy. Aristotle advocated the view that a philosopher should also be well-versed in medical matters (*On Sense and the sensible* 436a19–22; *On respiration* 480b26–30).

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