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Sense Perception in Aristotle and the Aristotelian Tradition

Pavel Gregoric and Jakob Leth Fink

When we open our eyes, we see. What we see depends, among other things, on what is around us. But what *is* around us? Should we say that trees, desks, and people are around us? Or should we say rather that what is around us are colours, shapes, sizes, and textures? Or should we perhaps say that what is around us are atoms, fields, and patterns of electro-magnetic radiation? Even if reality is indeed made of particles, fields, and patterns of electro-magnetic radiation, few of us would be inclined to say that is what we see when we open our eyes. Physics teaches us that reality is hidden from our senses, so whatever we see around us, be they trees and desks, or colours and shapes, they are only appearances.

Aristotle would resolutely disagree. In his view, colours and shapes are real, as real as trees, desks, people, and other objects that are members of a totality that can be called “reality” or “the universe.” However, reality is not exhausted by material objects that can be seen, heard, smelled, tasted, or touched, for Aristotle thought that there are also immaterial objects, objects that cannot be known by perception but only by a special cognitive capacity that he called “intellect.” Moreover, he thought that objects around us have essences that we must grasp in order to explain their characteristic features, their genesis, and their behaviour, and that these essences are also accessible only by intellect. So, there is much more to reality, according to Aristotle, than meets the senses. However – and this is what distinguishes Aristotle from his teacher Plato and many other philosophers – he thinks that without the senses, without their extensive and systematic use, we can never get into a position to explain things and understand reality.

According to Aristotle and his followers, then, the senses are a gateway to reality. They do not disclose all of reality, but the portion that they do disclose is quite generous. More importantly, the senses disclose reality in a reliable way, at least at the most fundamental level of their reach. Because they are in principle reliable and because their scope is quite generous, the senses enable animals to navigate their environment and rational animals in particular to

develop an understanding of reality. To be sure, Aristotle and his followers believed that successful navigation and understanding of reality requires that it somehow be represented by imagination, memory, and intellect; but before reality can be re-presented, first it has to be presented to the senses. That is why the first volume in the *Forms of Representation in the Aristotelian Tradition* series is dedicated to sense perception.

The chapters in this volume discuss various topics related to sense perception in Aristotle and his illustrious followers, from Alexander of Aphrodisias (third century) and Avicenna (eleventh century) to Albert the Great (thirteenth century) and Franz Brentano (nineteenth century). In order to facilitate the reading of these chapters, we first outline why sense perception was of paramount importance to Aristotle and how he went about explaining it. Next, we flag some interesting questions related to this topic that were raised in the later Aristotelian tradition, first Arabic and then Latin; as we proceed, we briefly introduce the individual chapters by putting them in the context of this volume. At the end, we include an overview of the main resources for studying both Aristotle's views about sense perception and their reception in the later Greek, Arabic, and Latin Aristotelian traditions.

1 The Importance of Sense Perception

According to Aristotle, all animals are able to collect information about their environment through their senses: that is what differentiates animals from plants. Moreover, Aristotle distinguishes two large classes of animals: those that are stationary, such as sponges and sea-anemones, and those that can move themselves, such as bees, dogs, and humans. Stationary animals have the contact senses of touch and taste but do not have the distance senses of smell, hearing, and sight. By contrast, mobile animals invariably also have at least one, two, or all three distance senses. So, the contact senses are invariably present in all animals, since animals are physical entities set in a physical environment, and it is vital for them to be able to register beneficial and deleterious things in their immediate surroundings, especially in order to identify nourishing substances. Moreover, mobile animals require distance senses precisely in order to be able to navigate their environment in search of food, mates, shelter, warmth, or whatever else is necessary for their existence and well-being. Obviously, then, sense perception is a capacity of paramount biological importance.

All mobile animals, Aristotle informs us, have a sensory apparatus such that perceptions leave traces in them. External objects can appear to such animals in various ways, and these appearances can be stored and later matched with fresh perceptions. That is, most mobile animals are endowed with the capacity to have things appear to them (Aristotle calls this capacity *phantasia*, sometimes translated as “imagination”) and with the related capacity to remember. Furthermore, humans, and perhaps a few other species of animals, have such a powerful memory that things experienced before somehow get grouped and organised in one’s mind so that similarities and differences among them become obvious. This enables one to compare what is present with what is absent, to represent and anticipate things, and to behave intelligently. Aristotle calls this ability “experience” (*empeiria*).

Human beings have much more powerful experience than any other species, which probably has something to do with the fact that human beings have language and concepts to capture various similarities and differences and to group things in all sorts of ways. Once things and facts are grouped and organised, some humans are wont to ask the question “Why?”: they want to know the *causes* of things being the way they are. If they gather a sufficient amount of data, and if they have grouped these data in the right way, they will begin to discern causal connections among them. The recognition of these causal connections will lead to other more general rules, and so on, until they discover the first principles, which explain other things without themselves being explainable by anything else. What enables them to discover these causal connections and to recognise the first principles is a special capacity called *noûs*, usually translated as “intellect.” The intellect is the ability to grasp the forms or essences of things, the crucial causal factors that explain things fully and reliably, that is, scientifically. The intellect, Aristotle argued, does not have a bodily organ, it is infallible, and it connects us with the divine.

Aristotle agrees with his teacher Plato on many things about the intellect and its role in scientific knowledge (*epistémē*), but he disagrees crucially about the role of perception. Plato thought that true understanding does not come from the senses, but from recollection and rigorous dialectical exercises, which are often impeded by sense perception. Aristotle, by contrast, thought that true understanding must start with the senses. To achieve scientific knowledge of a subject, one has to collect a lot of data, and that requires extensive and systematic use of the senses. Now, if scientific knowledge is to be based on data collected through the senses, the senses must be, in principle, reliable. Of course, Aristotle recognises that the senses can go wrong in many ways, but

he was deeply convinced that, at the fundamental level and in normal circumstances, they give us reliable access to the world as it is.¹

The simplified story in the preceding paragraphs was intended to demonstrate the epistemological importance of sense perception for Aristotle. It is the most fundamental cognitive ability, one on which all the other cognitive abilities rest – directly (appearance, memory, experience) or indirectly (intellect). It is also a crucial ability from the standpoint of biology, as we have seen, in that most animal activities rest on it, from feeding and reproducing to moving about and socialising. The paramount biological and epistemological importance of sense perception, then, explains why Aristotle has paid so much attention to it, and, consequently, why it remained one of the central topics for the later Aristotelian tradition.

Aristotle discusses sense perception in many of his works, but most prominently in his extremely rich and much studied work *De anima* (*On the Soul*).² In this work he undertakes, among other things, to explain what sense perception is. This particular task keeps him occupied through nine consecutive chapters of *De anima* (2.5–3.2), out of thirty in total. The next place to look at is the collection of short biological treatises known as the *Parva naturalia*, especially the opening treatise entitled *De sensu et sensibilibus* (*On Sense and the Objects of Perception*). In this text, Aristotle discusses a series of particular questions related to the senses and their objects, questions that he was unable to address in *De anima* without disrupting its flow. The rest of the *Parva naturalia* also contains valuable remarks about the sensorium – the centralised system of organs and tissues dedicated to perception – and the processes therein, about *phantasia*, memory, and other cognitive abilities closely related to sense perception. Other biological works are also informative. *De partibus animalium* (*On the Parts of Animals*) contains a general account of the parts that make up the sensorium, *Historia animalium* (*Investigation of Animals*) includes observations about these parts in different species of animals, and *De generatione animalium* (*On the Generation of Animals*) presents observations on the generation and development of these parts.

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- 1 More on Aristotle's theory of cognition can be found in Sten Ebbesen and Pavel Gregoric, "Introduction: Cognition and Conceptualisation in the Aristotelian Tradition," in *Forms of Representation in the Aristotelian Tradition, Volume Three: Concept Formation*, ed. C. Thomsen Thörnqvist and J. Toivanen (Leiden: Brill, 2022), 1–33. See also p. 24 below.
 - 2 It may be added that the Greek text of *De anima* is unusually problematic, especially in the third book, which poses further challenges to readers and scholars.

2 The Explanatory Framework

As is well known, Aristotle explained all material objects, be they natural or artificial, by analysing them into form and matter. Form is the principle of the organisation of matter, the factor that accounts for the shape and behaviour of things. Matter is something in which a form can be realised, for instance, a chunk of marble to which the sculptor gives the form of Hermes. To explain a material object, then, one first needs to understand its form; for only once we understand the form of a certain type of object can we begin to understand why it has such-and-such a material composition and why it undergoes the processes that we normally find in objects of that type.

Living beings form one large class of natural objects, so they too are analysed into form and matter. Their form is their soul (*psyché*) and their matter is the body (*sōma*) equipped with organs. The soul explains the characteristic shape and organisation of the body, accounts for a living being's identity and persistence, and enables the living being to engage in activities typical for living beings of that kind. It should already be clear that, according to Aristotle, the soul is something immaterial, much like in Plato, but not something that could exist or operate without a suitable body. In contrast to Plato, then, immortality is out of the question for Aristotle – except perhaps in some rather impersonal way, on account of the fact that the intellect does not have an organ and is separable from the body.

Given that sense perception is an all-important feature of one large group of living beings, namely animals, Aristotle's explanation of sense perception is twofold. The formal part of the explanation is found in his account of the soul, whereas the material part is found in his account of the body. Since the formal part is prior and more important in Aristotle's explanatory framework, it is necessary to look at his *De anima* first, where we find his account of the soul. Aristotle proceeds by suitably determined soul-parts. First comes the nutritive part, which is common to all living beings and which explains their abilities to process nourishment, to grow in a proportioned way, and to reproduce themselves. Second is the perceptual part, which is common to all animals and accounts for the whole range of their perceptual abilities, as well as for their abilities to experience appearances and to remember. Finally, third is the thinking part, which is peculiar to humans (at least in the sublunary sphere), enabling them to have thoughts, combine them into propositions, and above all to grasp forms and acquire scientific knowledge.

Now, how does one give an account of a part of the soul? Each part of the soul is a capacity, or a set of closely related capacities, for some vital activity,

and Aristotle insists in *De anima* 2.3 that the only way to explain a capacity is by explaining the corresponding activity. However, to explain an activity, one needs first of all to explain the objects of that activity. The idea is that an object of a certain kind is the proper cause of a certain sort of activity, and this activity is nothing other than an activation of the relevant sort of pre-existing capacity; of course, the capacity exists in the body (or more specifically in the bodily parts designed to support such a capacity), in line with Aristotle's form-matter analysis. To understand the perceptual part of the soul, then, we need to understand four things: (1) the object of perception, (2) the activity of perceiving, (3) the capacity of perception, and finally (4) the bodily parts involved in perception.

Before we proceed to explain each of these four things, we should like to note that the fourth does not belong to the scope of *De anima*. As we have pointed out, *De anima* is a treatise on the soul, and hence we should not expect to hear much on the constitution and processes that underlie sense perception. Aristotle's views on these topics are found in other texts, notably in the *Parva naturalia*, *De partibus animalium*, and *De generatione animalium*.

2.1 *The Objects of Perception (Sensibles)*

In *De anima* 2.6, Aristotle draws a distinction between three kinds of objects of perception (or sensibles, *aisthētá*). There are, he thinks, two kinds of objects that are perceived directly, or in themselves (*káth' hautá*), and one kind that is perceived only indirectly, or accidentally (*katà symbebēkós*).

The most basic kind of objects that are perceived in themselves are the "proper" or "special" sensibles (*íδια aisthētá*). There are five types of special sensibles, and each type can activate only one sense modality: for instance, colours activate only the sense of sight, and sounds only the sense of hearing. Such sensibles are the most basic object and each sense modality is *defined* with reference to the type of sensible that is special to it. For example, the sense of sight is essentially the capacity to perceive colours (i.e., the capacity activated by colours), whereas the sense of hearing is essentially the capacity to perceive sounds (i.e., the capacity activated by sounds), and so forth. This enables Aristotle to differentiate the senses, which is the topic of Katerina Ierodiakonou's chapter to which we will return shortly. What is important to point out here is that the special sensibles, according to Aristotle, are not just phenomenal properties of things, but fully real qualities of bodies out there, as real as the bodies themselves are.

Each particular special sensible is a quality on a spectrum bound by a positive and a negative extreme: for instance, all colours are qualities in the range

between white and black (or, rather, light and dark), all flavours are qualities in the range between sweet and bitter, and similarly for smells. Sounds are a bit different, since they are produced by the striking of bodies, but again they range from high to low. Tangible qualities come in several different ranges, notably hot-cold, moist-dry, and soft-hard, which raises the question whether touch is a single sense. We shall return to this question later. Aristotle claims that the special sensibles of touch are the qualities that all bodies have *qua* bodies. In other words, if something is a body, it will have some degree of hotness or coldness (temperature), some degree of moistness or dryness (humidity), and some degree of hardness or softness (consistency), which makes bodies in principle accessible to the sense of touch.

Once the five types of special sensibles are distinguished in *De anima* 2.6, the agenda is set for the first part of Aristotle's account of the perceptual part of the soul; this consists in going through each one of the five senses by looking at each type of special sensible and the conditions under which they cause the activation of the corresponding sense. This is what we find in *De anima* 2.7–11, where Aristotle considers each sense by looking at the corresponding type of special sensible, the medium through which the sensible affects the sense, the requisite state of the medium, and the way in which the sensible is produced, as the case may be (e.g., the medium of colours is air or water which must be lit; sounds have to be produced by interaction of bodies of certain properties).

The other kind of objects perceived in themselves are the so-called common sensibles (*koinà aisthētá*). The common sensibles are mostly quantitative properties of bodies, such as shape, size, number, and motion. They are called "common" because they are perceived by two or more senses. However, Aristotle observes that they are perceived as accompaniments of the special sensibles. There is no special sense just for shapes or just for sizes; rather, the five senses perceive them insofar as shapes and sizes come together with the special sensibles. For instance, we see and feel shapes because shapes determine both colours and tangible qualities. We never see just a colour, but rather, every colour we see is of some shape and size, either one or many, either moving or resting, and likewise with the tangible qualities.

It is a controversial issue exactly how the common sensibles are perceived. On the one hand, Aristotle seems to think that we perceive them with the special senses, so he would be inclined to say, for example, that we see shapes, hear motions, or feel magnitudes. On the other hand, he sometimes speaks of the so-called common sense (*koinē aisthēsis*), a higher-order perceptual capacity that unifies and monitors the five special senses, and thus many interpreters

have thought that the perception of the common sensibles is the task of the common sense. Whatever Aristotle's considered view on this question is, he believed that the senses need to be unified for the perception of the common sensibles to take place. Another controversial issue is exactly how many types of common sensibles Aristotle acknowledges, and in particular whether time and distance should be included.

The third kind of object of perception is things which are perceived only indirectly, or accidentally; they piggyback, as it were, on the special and the common sensibles. Aristotle claims that we perceive, for example, the son of Diares. However, we do not perceive him on account of his being the son of Diares, but on account of his being of a certain colour, shape, and magnitude. It is that colour of that shape and magnitude that activates our sense of sight, but what we see is more than that: we also see the son of Diares. Aristotle explains that this is because the colour, the shape, and the magnitude happen to belong (*syμβέβηκε*) to the son of Diares. Apart from substances under different descriptions, Aristotle clearly recognised locations as a type of accidental sensible. It is likely that items in any of the ten Aristotelian categories can figure as accidental sensibles, though that is disputed among scholars.

Another subject of dispute is whether accidental sensibles are objects of perception at all, rather than Aristotle's concession to ordinary language in which we regularly report perceptual events. For example, we would normally say that a dog stopped when it saw the car coming, without implying that the dog has the conceptual resources to perceive *cars* as anything other than large and fast-moving things of threatening sound and foul smell. Some scholars think that accidental sensibles are in fact a matter of "association of ideas," which requires a minimal conceptual apparatus or perhaps involvement of non-rational capacities such as *phantasia* and memory, whereas still others construe it as a sort of genuine perception.

This question is taken up by MIKA PERÄLÄ in his chapter. He shows that neither the perceptual nor the intellectual interpretation succeeds in accounting for all the cases of accidental (or incidental, *katà syμβebēkós*) perception that Aristotle discusses in his psychological and methodological treatises. The perceptual interpretation fails because it is unable to explain accidental perception of universals. The intellectual interpretation fails because it overlooks accidental perception of proper sensible items of another sense. To avoid these problems, Perälä proposes an interpretation that incorporates the benefits of both interpretations without their faults. The proposal is that Aristotle has two somewhat different understandings of accidental perception, a 'deflationary' and an 'inflationary' one. In the deflationary sense, accidental perception

involves *less* than direct (*káth' hautó*) perception; it is merely a way of indicating what an individual sense does not perceive directly. So understood, accidental perception encapsulates whatever goes on beyond the scope of an individual sense. By contrast, accidental perception in the inflationary sense involves *more* than direct perception by a single sense, typically on account of the engagement of other cognitive capacities in addition to the individual sense in question. Perception of the son of Diareas can be understood in either way. Perälä's discussion of accidental perception offers an epistemological (as opposed to metaphysical) analysis which will be relevant for broader issues concerning Aristotle's position with respect to the individuation of the senses and his distinction of sense perception from other forms of cognition.

Aristotle's discussion of the common and accidental sensibles in *De anima* 3.1–2 shows that the perceptual part of the soul is more than just a collection of the five senses discussed in *De anima* 2.7–11. Most importantly, it shows that the perceptual part of the soul is a unified faculty that can achieve more than the five senses severally. One such achievement is simultaneous perception of several special sensibles, which is problematic on account of Aristotle's metaphysical principle that only one object can exercise one capacity at any one time. In his chapter, JUHANA TOIVANEN demonstrates how medieval philosophers in the Latin tradition elaborated on Aristotle's account of simultaneous perception, mainly on the basis of *De sensu* 7. The medieval commentaries take up various versions of the general problem when they ask whether one external sense can perceive two different sensible qualities, whether two external senses can function at the same time equally well, and especially how different sense modalities are united in the common sense. Although the answers that medieval authors give follow to a large extent the general lines set by Aristotle and Alexander of Aphrodisias (fl. 200 CE), they also put forth different interpretations and use new strategies, especially when they concentrate on selective attention and on degrees of perceptual awareness. In addition to the commentaries on *De sensu*, Toivanen also takes discussions concerning the functions of the common sense in relation to *De anima* 3 into account.

Whether the perceptual part of the soul operating as a unified faculty is the same thing as the common sense or not, and what exactly are its (or their) functions, are issues debated in the Arabic and Latin tradition as much as in the contemporary scholarship. For instance, some Aristotelians keep the common sense distinct from *phantasia*, whereas others subsume *phantasia* under the common sense; some scholars think that our awareness of our own seeing

and hearing is due to the common sense, while others think that it is due to the senses of sight and hearing; some scholars think that we perceive the common and the accidental sensibles with the common sense, others think that we perceive them with the special senses, and so forth.

Before leaving the topic of the object of perception, we would like to make note of Aristotle's conviction that our senses are most prone to error with regard to the common sensibles, less prone with regard to the accidental sensibles, and infallible with regard to the special sensibles.³ In only one passage does Aristotle qualify his otherwise strident assertion of infallibility of the senses with regard to their special objects: "Perception of special sensibles is true, or is subject to falsity in the smallest degree."⁴ This qualification is usually interpreted with reference to abnormal conditions of perceiving, for instance, excessive distance of observation, disturbance in the medium, disorder of the sense organ, general pathological state of the perceiver, and the like. In normal or natural conditions, however, when the object is close, the medium steady and the perceiver healthy, the senses do not go wrong about the special sensibles.

This is a consequential point for Aristotle, given the importance he attaches to sense perception: unless the senses give us reliable access to reality, at least on some fundamental level, not only would animals have a hard time navigating their environment, sustaining themselves and continuing the species, but also our sciences would have very shaky foundations. Because the senses are capacities essentially related to and activated by their special objects, according to Aristotle, the senses cannot go wrong about their special sensibles, except perhaps in unnatural or abnormal circumstances. And if the senses do not go wrong about the special sensibles, human beings should be able to hone their perception of the common and accidental sensibles, and to derive scientific knowledge from data gathered with sufficient care and precision.

2.2 *The Activity of Perceiving (Sense Perception)*

Like philosophers before him, Aristotle argues in *De anima* 2.5 that the activity of perceiving is the result of the agency of external objects acting on animals. It is by virtue of certain attributes, namely special and common sensibles, that external objects affect the senses. However, Aristotle rejects the view that

3 *De An.* 3.3, 428b18–25; cf. *de An.* 2.6, 418a8–16; *Sens.* 4, 442b8–16; *Metaph.* 4.5, 1010b1–3. On some of the controversy regarding this matter, see Mark A. Johnstone, "Aristotle and Alexander on Perceptual Error," *Phronesis* 60 (2015): 310–38; and Benjamin R. Koons, "Aristotle on Infallible Perception," *Apeiron* 52 (2018): 415–43.

4 *De An.* 3.3, 428b18–19.

perception is a material process in which something comes out of the objects and enters into the sense organ, or in which something comes out of the sense organ and interacts with the objects.⁵ Moreover, he denies that this causal process is an ordinary type of change (*kinēsis*) in which one quality in the recipient gets replaced by another, as when a kettle on the stove is changed from cold to hot. Rather, it is a transition whereby a pre-existent capacity is brought to perfection, since the whole purpose of the senses is to be actualised by their objects, that is, to perceive them. And this sort of change is not a process that takes time to accomplish, but it is rather an activity (*enérgeia*) that is complete at every moment of its duration.

Aristotle's innovation – based on his philosophical toolkit of form and matter, potentiality and actuality – lies in the idea that the members of the causal relation are objects with certain attributes on one end, and ensouled beings endowed with certain capacities on the other end. When they meet, the objects bring the sense of the animal from potentiality into actuality. Consequently, if we know what the right sort of object is and if, moreover, we understand that the senses are aspects of the soul (form) couched in certain parts of the body (matter), then we have all the ingredients necessary to understand what the activity of perceiving is: it is having the senses brought into actuality by the agency of external things on account of a certain set of their qualitative and quantitative attributes (the special and the common sensibles). For example, I see the cup on my table because a suitable agent and a suitable patient are in a situation for their interaction: on account of being white, round, and medium-sized, the cup activates my sense of sight, which is couched in my healthy eyes that are facing the cup while the air around me is well lit.

According to Aristotle, this is the primary, formal part of an explanation of the activity of perceiving. Some scholars will disagree, but we believe there is also a further, material part of the explanation, for instance in terms of how sounds and smells propagate through the medium of air and water, in terms of the changes (*kinéseis*) set up in the sense-organs, and in terms of the transmission of these changes from the peripheral to the central sense organ in the body. Understandably, this material part of the story is not found in *De anima*, but it can be reconstructed from Aristotle's other writings. To be sure, it is secondary for Aristotle and does not receive as systematic a treatment as the formal part of the story, but it does exist, and many later thinkers found it fascinating

5 The first type of theory is called “intromissionist” and it was advocated, for example, by Democritus and Epicurus. The second, “extramissionist” theory was espoused, for example, by Empedocles and Plato in the *Timaeus*. In some passages, surprisingly, Aristotle seems to espouse an extramissionist theory; see below, 30 and n17.

and worth developing. However, it would be distinctly un-Aristotelian to think that the formal part can ever be replaced by or reduced to the material part of the story.

2.3 *The Capacity of Perception (Sense)*

With the division of objects of perception, as we have seen, Aristotle laid the foundation for his account of the perceptual part of the soul. In particular, his division of the special sensibles allows him to demarcate the five senses. The sense of touch poses a problem, however, since it registers several different qualitative ranges, namely hot-cold, moist-dry, and soft-hard. As we have mentioned, Aristotle claims that these qualitative ranges are qualities of bodies *qua* bodies, and he proposes that the criterion for demarcation in the case of the sense of touch is contact, which distinguishes it from sight, hearing, and smell, but requires that the sense of taste be subsumed under the sense of touch, which seems to complicate things.

In her chapter, KATERINA IERODIAKONOU reopens the discussion about the ancient philosophers' criteria for the individuation of the senses by examining closely not only the relevant Aristotelian treatises but also what the commentators of late antiquity and, in particular, Alexander of Aphrodisias has to say on this topic. Since Aristotle's texts are concise and somewhat obscure, Alexander's comments prove helpful in unravelling Aristotle's thought. Moreover, they provide us with reliable evidence of further developments in the ancient theories concerning problems related to the differentiation of the senses as well as to their hierarchy. For it seems that, although Aristotle's account of the senses often emphasises the role of their special objects, the later Aristotelian tradition is committed to a multitude of criteria that give to the whole issue a complicated and rather intriguing dimension.

Franz Brentano (1838–1917) was a first-rate Aristotle scholar, in addition to being a leading philosopher of his own day. One idea that Brentano borrowed from Aristotle and developed in interesting directions, as HAMID TAIEB shows in his chapter, is exactly the thesis that the senses should be classified in accordance with their special objects, the special sensibles, or “sensible qualities,” as Brentano calls them. When looking for a criterion that makes it possible to identify different kinds of sensible qualities themselves, Brentano again takes his cue from Aristotle. Each kind of sensible quality has a specific pair of extremes, for instance light vs. dark in the case of colours, high vs. low in the case of sounds and so forth. Taieb presents Brentano's account of the classification of the senses and discusses both its historical faithfulness to Aristotle and its philosophical relevance for contemporary philosophy of mind, in particular with respect to Brentano's interpretation of sensible qualities as

mere phenomenal, mind-dependent entities. Brentano's views show how an Aristotelian framework in the philosophy of mind can be transposed into a more modern, phenomenological pattern, while also revealing the limits of such transpositions. As Ierodiakonou's and Taieb's chapters make clear, Aristotle's views on these aspects of sense perception inspired a lasting debate.

It is noteworthy that Aristotle opens *De anima* 3.1 with an argument that there are no more than five senses. His argument is based on the assumption that the senses can only be realised in simple bodies (elements), and all the simple bodies are already used for the existent senses.⁶ Although Aristotle's argument is not particularly convincing, it is clearly meant to exclude the possibility that there are qualitative ranges of which human beings are oblivious because we are not equipped with the requisite senses. And it was important for Aristotle to exclude that possibility, given the foundational role he attaches to perception and given his deep conviction that human beings are by nature adequately equipped for a full understanding of the universe.

De anima 2.12 is sandwiched between Aristotle's account of the five special senses in terms of their special sensibles and the conditions of their mediation and production (*De anima* 2.7–11) and his discussions of various issues that are intended to show that the perceptual part of the soul is a unity that can achieve much more than the five senses taken severally (*De anima* 3.1–2). In 2.12 Aristotle advances several claims of central importance for his interpreters.

First, Aristotle opens the chapter by saying that the sense is "that which can receive sensible forms without matter."⁷ Presumably, a "sensible form" (*aisthētòn éidos*), or what came to be called a "sensible species" (*species sensibilis*) in the Latin tradition, is a special sensible together with a set of common sensibles, for example this relatively small round patch of bright red colour that we see when we look at a tomato on the far side of the table. The phrase "without matter" seems to refer to the matter of the object in which this set of properties is instantiated, the matter of the tomato in our example. So, to perceive is for a sense to take on a sensible form of an external object without its matter. This formula stands at the centre of an extended debate among contemporary scholars as to the character of the change implied here. Some hold that a physiological change in the sensory apparatus takes place – the eyes literally take on the red colour when we see a tomato – while others maintain that the change in question is a transition of a sense from potentiality into

6 The relation between the senses and the elements is picked up again in *Sens.* 2.

7 *De An.* 2.12, 424a17–19.

actuality, which amounts to an intentional act of perceptual awareness. The two lines of interpretation are known as ‘literalism’ and ‘spiritualism.’⁸

Second, Aristotle describes the sense as a *lógos* or proportion of the sense organ.⁹ His idea seems to be that the senses are essentially proportioned to their special objects, which explains why the senses can operate only within a certain range of parameters, or, to put this in negative terms, why the senses are obstructed or even destroyed when exposed to objects that are out of proportion, “just as the concord and pitch of a lyre is destroyed when the strings are struck violently.”¹⁰ This will be a salient point of contrast between the senses and the intellect, since intense objects of thought neither destroy nor obstruct but, on the contrary, improve thinking, which Aristotle takes to indicate that the intellect does not have a bodily organ.¹¹

Third, and closely connected to the previous point, Aristotle describes the sense as a mean (*mesótēs*).¹² The sense must be neutral with respect to its range of qualities. Otherwise, if the sense already had a particular quality, it would not be able to be affected by it, that is, to perceive it. This is why the eye, for example, has to be filled with transparent eye-jelly, so that it can receive any colour. By contrast, the flesh, as the organ of the sense of touch,¹³ necessarily has some degree of hotness, wetness, and softness, which is why the sense of touch cannot register objects which instantiate these qualities in exactly the same degree. However, Aristotle insists that the flesh – especially in humans, who have a keener sense of touch than other animals – is constituted in such a way that it has exactly the middle degree of these qualities, so that the sense of touch is receptive to both ends of the respective qualitative ranges.

8 The champion of ‘literalism’ is Richard Sorabji, who presented this reading in “Body and Soul in Aristotle,” *Philosophy* 49 (1974): 63–89; reprinted in *Articles on Aristotle*, vol. 4: *Psychology and Aesthetics*, ed. J. Barnes, M. Schofield, and R. Sorabji (London: Duckworth, 1979), 42–64. The ‘spiritualist’ challenge came from Myles F. Burnyeat, “Is an Aristotelian Philosophy of Mind Still Credible? (A Draft),” in *Essays on Aristotle’s De Anima*, ed. M. C. Nussbaum and A. O. Rorty (Oxford: Clarendon Press, 1995), 15–26. A good summary of the debate is supplied by Victor Caston, “The Spirit and the Letter: Aristotle on Perception,” in *Metaphysics, Soul, and Ethics in Ancient Thought: Themes from the Work of Richard Sorabji*, ed. R. Salles (Oxford: Clarendon Press, 2005), 245–320.

9 *De An.* 2.12, 424a25–31.

10 *De An.* 2.12, 424a31–32.

11 *De An.* 3.4, 429a31–b4. We take “intense objects of thought” to be things of great explanatory power, such as the first principles of a science.

12 *De An.* 2.12, 424b1–3.

13 More precisely, the flesh is the internal medium of the sense of touch, according to Aristotle, whereas its proper sense organ is the heart.

Aristotle asks why plants do not perceive, given that they have a soul and given that they clearly are affected by things in their environment, for instance, when they are heated by the surrounding air. The reason, he says, is that they do not have the requisite mean, “the sort of principle that receives the forms of sensible objects; rather, they are affected together with matter.”¹⁴ Plants have a soul with the nutritive and the reproductive capacities, but not with a perceptual capacity, that is, with a sense that could take on sensible forms of external objects. Consequently, plants are affected by external objects only materially, as physical things that undergo standard sorts of change, like a kettle on the stove.

In order to defend Aristotle’s claim that plants have no sense perception, medieval philosophers not only had to confront the easily observed phenomenon that plants are affected by perceptible objects, as CHRISTINA THOMSEN THÖRNQVIST shows in her chapter, but they also had to get their heads around a number of theoretical problems concerning sense perception that seem to arise from Aristotle’s conclusion. Medieval commentators had to sift through a number of different Aristotelian texts to come up with answers. Since Aristotle’s own promised investigation of plants is now lost (if it was ever written), they could not simply look the question up, but had to think for themselves on the basis of his scattered remarks concerning plant life.¹⁵

The medieval discussion on the alleged absence of perception in plants was primarily triggered by Aristotle’s claim in *Somn. Vig.* 1, 454b27–455a3 that since plants lack perception, they also lack the capacity to sleep and wake. Medieval philosophers were, of course, aware that plants at least appear to rest at certain intervals: some flowers open in the morning and close at night, and perennial plants wither away in autumn and return in spring. What is the nature of this alteration in activity if, as Aristotle claims, it is not sleep and waking? There were further problems related to the question of plant perception that bothered the commentators – substantial philosophical problems that are related to Aristotle’s overall theory of the soul and that still puzzle us today. In *Somn. Vig.* 1, 454a24–b4, Aristotle claims that animals cannot survive without rest because it is impossible for the sensitive soul to be in constant activity. If plants only have the nutritive soul and lack the capacity to sleep, then the nutritive soul, unlike the sensitive, must have the capacity to operate continuously until the organism dies. What underlying fundamental difference(s) between the nutritive and the sensitive soul does this entail? Furthermore, if

14 *De An.* 2.12, 424b2–3.

15 Aristotle, *Long.* 6, 467b4–5; cf. Diogenes Laertius 5.25.

plants lack the sensitive soul, they also lack desire, and if they lack desire, they cannot distinguish between good and bad nutriment. But plants still manage to sustain themselves by feeding. How is this possible? And what does it actually mean when Aristotle states in *de An.* 2.12, 424b3 that plants cannot perceive because they are affected by the form “along with the matter”? The commentators’ answers to the last question are highly relevant because they contribute to our knowledge of the background of the literalist vs. spiritualist interpretations of Aristotle’s theory of perception mentioned above. In her chapter, Thomsen Thörnqvist traces the development of the discussion of plant perception in a number of medieval Latin commentaries, from Adam of Buckfield (d. before 1294) to John Buridan (d. c.1361).

2.4 *The Bodily Parts Involved in Perception (Sense Organs)*

While the preceding three terms of Aristotle’s explanation of sense perception – object, activity, capacity – are all duly discussed in *De anima*, the remaining term rarely appears in that work. As noted by Alexander of Aphrodisias, the treatise *De sensu* was written, in part, to close that gap.¹⁶

De sensu 2 offers a discussion of the question of material components of different sense organs. Aristotle’s predecessors used the four elements to answer this question. Predictably enough, they encountered the problem that there are four elements, but five senses. The solution to this problem should have been simple. Since taste is subsumed to touch, their respective organs are composed of the same element (earth). Aristotle hesitates to pursue this alignment of sense organs with the elements any further, but if one wishes to do so, the result would be that water is the suitable material basis for the eyes and seeing; air the suitable material basis for the ears and hearing; fire the suitable material basis for the nostrils and smelling (odour being a kind of evaporation that arises from fire) and earth the suitable material basis for flesh and tactile perception. Taste falls under touch, as already mentioned. Apart from this, *De sensu 2* is famous for Aristotle’s rejection of extramissionist theories of vision, in which something comes out of the eyes and somehow interacts with the environment when seeing takes place. Interestingly, however, in some other works Aristotle seems to endorse an extramissionist theory of vision, for example in a passage from *Meteorology* 3.4 discussed by DAVID BENNETT and FILIP RADOVIC.¹⁷

16 Alexander of Aphrodisias, *In librum de sensu commentarium*, ed. P. Wendland (Berlin: Georg Reimer, 1901), 1.3–18.

17 Another place in which Aristotle seems to espouse an extramissionist theory is the curious passage about menstruating women and mirrors in *De insomniis* 2 (459b23–460a23),

Another important lesson of *De sensu*, reiterated in several other passages of the *Parva naturalia*, is that the peripheral sense organs – eyes, ears, nostrils, tongue, and flesh – are in a certain sense merely transmitters of sensible forms to the central sense organ. That is precisely why, for example, the inside of the eye has to be composed of a transparent matter, much like the medium of colours. Aristotle supports his claim by what happens when soldiers receive a blow in the temple so that the eye's passages are cut off from the central sense organ: they experience “a sudden fall of darkness as if a lamp had been put out, because the transparent part, the so-called eye-jelly, which resembles a lamp-screen, has been cut off.”¹⁸ Both air and water have the crucial quality of transparency, and the inside of the eye is made of water rather than of air, according to Aristotle, because water is contained more easily than air.¹⁹ Similarly, the sense organ of hearing is a portion of air walled inside the auricular canal by a delicate membrane, so that it can be affected by sounds spreading through the external medium of air or water.²⁰

So, the peripheral senses enable the sensible forms to be received and transmitted inwards to the central organ, which is the heart in Aristotle's theory. The peripheral sense organs like eyes and ears are connected to the heart via channels that plug into the network of blood-vessels. These channels are filled with *pneûma*, very fine warm air, and there are reasons to think that Aristotle envisaged a continuous portion of *pneûma* stretching throughout the blood-vessels all the way to the heart, enabling the transmission of sensible forms to the heart.²¹ The body of an animal thus seems to be constructed in such a way as to establish an uninterrupted connection between the objects in the external world and the heart. The sensible forms of external objects are received by the peripheral sense organs and transmitted to the heart, where all sense perception actually takes place and where sensory inputs from all sense modalities can be coordinated and monitored.²² The reader will not be surprised to learn that Aristotle's *De sensu* concludes by discussing the unity of the perceptual part of the soul.

for which see Pavel Gregoric and Jakob Leth Fink, “Introduction: Sleeping and Dreaming in Aristotle and the Aristotelian Tradition”, in *Forms of Representation in the Aristotelian Tradition, Volume Two: Dreaming*, ed. C. Thomsen Thörnqvist and J. Toivanen (Leiden: Brill, 2022), 14–15.

18 *Sens.* 2, 438b12–16.

19 *Sens.* 2, 438a15–16.

20 *De An.* 2.8, 420a4–11.

21 See Claire Bubb, “The Physiology of *Phantasmata* in Aristotle: Between Sensation and Digestion,” *Apeiron* 52 (2019): 273–315.

22 For details, see Klaus Corcilius and Pavel Gregoric, “Aristotle's Model of Animal Motion,” *Phronesis* 58 (2013): 56–67.

Aristotle's picture of a centralised system of bodily parts involved in perception is easy enough for us to understand if we replace Aristotle's "channels" and "blood-vessels" with "nerves," and if we think of the brain whenever he refers to the heart. Aristotle's cardiocentric theory would soon be rejected by the great third-century BCE Alexandrian doctors Herophilus and Erasistratus, who discovered the central nervous system and posited the brain as the central organ, in which they were followed by Galen (d. c.216). Through Galen's towering authority, the view of the brain as the central sense organ entered into Arabic medical and philosophical texts, and thence into Latin medieval philosophy, thus creating a large problem for all would-be Aristotelians: how to reconcile Aristotle's cardiocentrism with the encephalocentrism entrenched in the medical tradition?

3 The Arabic Reception: Sense Perception and Mental Disorders

The transmission of Peripatetic philosophy and Greek scientific literature more generally into Arabic culture, sometimes described as the "Graeco-Arabic Translation Movement," took place in the eighth to tenth centuries. Baghdad was the epicentre of this transition.²³ The sustained effort and dedication of the stakeholders in this process is breath-taking, as is the complexity of what happened and why. One of the fascinating factors in this process is the contribution, and resilience, of early Islamic theological speculation. Its impact on Arabic Peripatetic philosophy of sense perception cannot be neglected. By looking at the introduction of Aristotelian mechanisms of sense perception into the Arabic tradition, DAVID BENNETT's chapter describes how Mu'tazilite philosophy played a decisive role in shaping the intellectual milieu and presuppositions of Peripatetic Arabic philosophy of sense perception. The intellectual context, dominated by Mu'tazilite philosophy of nature and thus committed to atomistic, materialistic psychology, was slowly penetrated by Aristotelian epistemological concepts, although resistance was widespread. On top of that, Neoplatonism also held its ground as part of the intellectual environment, and philosophers such as al-Kindī (d. c.870) and al-Fārābī (d. 950/951), as well as the nascent philosophical school in Baghdad in the tenth century, had to reconcile their Aristotelian structure of knowledge-acquisition with Neoplatonic cosmology. Thus, as Aristotelianism infiltrated

23 See Dimitri Gutas, *Greek Thought, Arabic Culture: The Graeco-Arabic Translation Movement in Baghdad and Early 'Abāsīd Society (2nd–4th/8th–10th centuries)* (London: Routledge, 1998), 1–8.

mainstream philosophy, its expression was filtered through various doctrinal and methodological preoccupations. All of this affected and was in turn subject to influence from the translation process itself. The more well-known figures of Arabic Aristotelianism, such as Avicenna (d. 1037) and Averroes (d. 1198), must also be seen against this background.

Another decisive impetus came from Greek medicine, as already noted above. Mental disorders, such as hallucination, are of special interest to sense perception, because they were interpreted on the basis of Peripatetic-Galenic theories of perception. Avicenna's account of the relation between sensing and mental disorders bears this point out very clearly. In his writings on psychology and medicine, Avicenna identifies two ways of diagnosing mental disorders: one way is in relation to the function of the senses, while the other is in relation to a deliberative cognitive faculty. In his chapter, AHMED ALWISHAH demonstrates this by exploring the relations between the senses and faculties as they are affected by different aspects of mental disorders. One attains a richer understanding of the functions of sensation as it is assimilated by the cognitive faculty. Avicenna's integration of Aristotelian epistemology into his own methodology, grounded in medicine, is most evident in cases in which the ordinary process of perception is subverted. Mental disorders that result from the malfunction of the parts that are responsible for sensing in the brain are prime instances of this. Such disorders take place in the brain but are directly related to the functioning of the senses. In order to account for such mental disorders, Avicenna delves into the processes of the internal faculties of the soul. In this way, his account of mental disorder showcases the whole machinery of Peripatetic sense perception and faculty psychology as this is combined with Galenic encephalocentrism and the localisation of the faculties, not least the "inner sense," in the brain. The underlying philosophical problem is how the perceptible content of objects that do not exist in reality can exist in the disordered mind.

One curious disorder, recorded for the first time in Aristotle's *Meteorologica* 3.4, 373b1–9, is called "autoscopy," that is, a hallucination of one's own visual image. In their analysis of this passage and its reception in the Aristotelian tradition, DAVID BENNETT and FILIP RADOVIC integrate material from the Greek tradition, the Arabico-Latin tradition, a late thirteenth century Latin account, and contemporary psychopathology. Special attention is paid to modifications of Aristotle's original explanandum and diverging explanations of autoscopy in the commentary tradition, with an eye to contemporary descriptions of autoscopic phenomena in the clinical literature. Interpreted as an instance of perceptual error, autoscopy indirectly reveals how perception is supposed to work under normal, or ideal, conditions. The chapter includes the first edition

and translation of Peter of Auvergne's (d. 1304) discussion of the problem, from his commentary on Aristotle's *Meteorologica*, prepared by Sten Ebbesen.

4 Questions of Special Interest to Medieval Latin Commentators

On the basis of the catalogue of question commentaries on Aristotle's *De sensu* covering the period ca. 1260–1320, produced by the *Representation and Reality* group, it is possible to obtain a rough grasp of the topics and problems that were of special interest to the medieval Latin commentators.²⁴ Fourteen commentaries are listed, the earliest and most extensive written by Geoffrey of Aspill (d. 1287); other notable commentators include Peter of Auvergne, Radulphus Brito (d. 1320/21), and John Buridan (d. c.1361). Obviously, the questions depend to a large extent on remarks made by Aristotle in *De sensu*. Generally, the commentators are interested in questions concerning the five senses and their relation to the elements, with extended efforts to understand colours. Likewise, and unsurprisingly, almost every commentator takes up the question of whether the sense of sight should be explained on extramissionist grounds, which Aristotle denies in *De sensu* 2. Other problems are more local: Geoffrey of Aspill seems particularly fascinated by problems posed by reflections and images in mirrors, whereas the later commentators tend to worry about whether it really belongs to the natural scientist to consider health and disease. The few odd questions involving the brain (Peter of Auvergne, Anonymus Parisini 16160, John Buridan, Marsilius of Inghen), or the heart (Anonymus Parisini 16160, Anonymus Oriensis 33), are provoked by remarks by Aristotle concerning smell and touch respectively, but are grounded in the more general disagreement between the medical tradition's insistence on the importance of the brain (Galen, Avicenna), and Aristotelian cardiocentrism.

5 The Resources

It would be a Herculean task to supply a list of all the editions and translations of Aristotle's *De anima*, *Parva naturalia*, and other biological works, let alone a list of all the Greek, Arabic, and Latin commentaries. Consequently, we have to limit ourselves to a selection of what we believe are the most useful titles for further study of the subject of sense perception in Aristotle and

24 Sten Ebbesen, Christina Thomsen Thörnqvist, and Véronique Decaix, "Questions on *De Sensu*, *De memoria* and *De somno et vigilia*: A Catalogue," *Bulletin de philosophie médiévale* 57 (2015): 66–87.

the Aristotelian tradition, accepting the risk of omitting many valuable studies that have been published in the past century.

First, there is no definitive edition either of *De anima* or of *Parva naturalia*. The critical edition of *De anima* by Aurél Förster is held in the highest regard by the specialists, but it is extremely rare.²⁵ The accessible and widely used critical edition of *De anima* is that of William David Ross, the so-called *editio minor* in the Oxford Classical Texts series.²⁶ Ross's critical edition of the *Parva naturalia*, despite its shortcomings, is still the most widely used one among scholars,²⁷ though Paweł Siwek's edition is generally considered superior.²⁸

The commonly used English translations of *De anima* and *Parva naturalia* are John A. Smith's and John I. Beare's in the Oxford translation of the complete works of Aristotle, prepared under the editorship of William D. Ross in the early twentieth century and updated by Jonathan Barnes in 1984.²⁹ There are three very recent translations of *De anima* in English.³⁰ Christopher Shields's translation is accompanied with an extensive commentary, replacing the outdated partial translation and commentary of David W. Hamlyn in the Clarendon Aristotle Series.³¹ Fred Miller's very readable translation of both *De anima* and *Parva naturalia* comes in a convenient and affordable paperback. Of the commentaries in the English language, Robert D. Hicks's detailed commentary from 1907 is still useful; the most recent English commentary aiming at a philosophical audience is by Ronald Polansky.³²

25 *Aristotelis De anima libri tres*, ed. A. Förster (Budapest: Hungarian Academy of Letters, 1912).

26 *Aristotelis De anima*, ed. W. D. Ross (Oxford: Clarendon Press, 1956). The *editio maior*, with an English introduction and a modest commentary by Ross, appeared in 1961, also from Oxford University Press.

27 Aristotle, *Parva Naturalia*, ed. W. D. Ross (Oxford: Clarendon Press, 1955).

28 *Aristotelis Parva Naturalia*, ed. P. Siwek (Rome: Desclée, 1963).

29 Aristotle, *Parva Naturalia*, ed. J. I. Beare and G. R. T. Ross (Oxford: Clarendon Press, 1908); reprinted in vol. 3 of *The Works of Aristotle Translated into English*, ed. W. D. Ross (Oxford: Clarendon Press, 1931); *The Complete Works of Aristotle: The Revised Oxford Translation*, ed. J. Barnes, 2 vols (Princeton: Princeton University Press, 1984).

30 Aristotle, *De anima: Translated with an Introduction and Commentary*, trans. C. Shields (Oxford: Clarendon Press, 2016); Aristotle, *De anima: Translated with Introduction and Notes*, trans. C. D. C. Reeve (Indianapolis: Hackett, 2017); Aristotle, *On the Soul and Other Psychological Works*, trans. F. D. Miller, Jr. (Oxford: Oxford University Press, 2018).

31 Aristotle, *De anima Books II and III (with passages from Book I) Translated with Introduction and Notes*, trans. D. W. Hamlyn (Oxford: Clarendon Press, 1968); reprinted with a "report on recent work and a revised bibliography" by Christopher Shields (Oxford: Clarendon Press, 1993).

32 Aristotle, *De anima*, ed. R. D. Hicks (Cambridge: Cambridge University Press, 1907); Ronald Polansky, *Aristotle's De Anima* (Cambridge: Cambridge University Press, 2007).

The most recent German translation of *De anima* is by Klaus Corcilius, accompanying a redaction of Förster's Greek text and a helpful introduction. Corcilius is preparing a new German commentary on *De anima* in the authoritative Akademie Verlag series to replace the outdated translation and commentary by Willy Theiler.³³ There is an accessible German translation of the *Parva naturalia* by Eugen Dönt.³⁴ There are two handy translations of *De anima* in French, by Richard Bodéüs and by Pierre Thillet, both accompanied with an introduction, notes, and bibliography.³⁵ The former is included, with Pierre-Marie Morel's translation of the *Parva naturalia*, in the complete works of Aristotle in French translation under the editorship of Pierre Pellegrin.³⁶

The Greek commentary tradition on *De anima* is very rich.³⁷ The most influential of the Greek commentators, Alexander of Aphrodisias, wrote a commentary on Aristotle's *De anima* that has been lost. What survives, however, is Alexander's own treatise entitled *De anima*, closely modelled on Aristotle's and very helpful as an aid to reading Aristotle. We also have Alexander's commentary on *De sensu*. Several short essays on topics related to sense perception are contained in his *Quaestiones et solutiones* (e.g., question 3.7 is on Aristotle's argument in *De anima* 3.1 that there are no more than five senses, question 3.6 is on Aristotle's discussion of perceptual awareness in *De anima* 3.2, question 3.8 is a discussion of accidental perception) and in the so-called *Mantissa* (e.g., "That light is not a body," "Against those who claim that seeing comes about through the entry of images," "How seeing comes about according to Aristotle").³⁸

Literal commentaries on Aristotle's *De anima* were written by Simplicius (c.490–c.560) and Philoponus (c.490–c.570), whereas Themistius (c.315–c.390) and Sophonias (fl. thirteenth century) wrote paraphrases. The first Greek commentary on the *Parva naturalia*, apart from Alexander's commentary on *De sensu*, was composed by Michael of Ephesus (fl. twelfth century). There is also a paraphrase of the *Parva naturalia* attributed to Themistius but in fact written much later by Sophonias. Most of these commentaries are translated into

33 Aristoteles, *Über die Seele*, ed. W. Theiler (Berlin: Akademie Verlag, 1983).

34 Aristoteles, *Kleine naturwissenschaftliche Abhandlungen*, ed. E. Dönt (Stuttgart: Reclam, 1997).

35 Aristote, *De l'âme*, trans. R. Bodéüs (Paris: Flammarion, 1993); Aristote, *De l'âme*, trans. P. Thillet (Paris: Gallimard, 2005).

36 Aristote, *Petits traités d'histoire naturelle*, ed. P.-M. Morel (Paris: Flammarion, 2000); Aristote, *Oeuvres complètes*, ed. P. Pellegrin (Paris: Flammarion, 2014).

37 The commentaries have been published in the *Commentaria in Aristotelem Graeca* series, which was published from 1882 to 1909 by the publisher Georg Reimer in Berlin.

38 It is questionable whether the *Mantissa* is an authentic work of Alexander's. The best edition of the *Mantissa*, with an introduction and commentary, is by Robert Sharples: Alexander of Aphrodisias, *De anima libri mantissa* (Berlin: De Gruyter, 2008).

English within the *Ancient Commentators on Aristotle* series edited by Richard Sorabji and published by Bloomsbury (previously by Duckworth).

The medieval Arabic reception of Greek philosophy, medicine, and astronomy resulted in a flood of translations and has been the subject of much scholarship.³⁹ There were at least two Arabic translations of *De anima* in circulation in the ninth century; one, attributed incorrectly in the MS to Iṣḥāq ibn Ḥunayn, is available in a modern edition.⁴⁰ The situation with the texts in the *Parva naturalia* is more complicated. A peculiar adaptation of the treatises on sleep and dreaming was produced under the title *Kitāb al-Ḥiss wa-l-maḥsūs* (“On Sensation and the Object of Sensation,” named after the largely lost first section, which was a translation of *De sensu*); this text diverges considerably from the Aristotelian originals.⁴¹ It is this text that was the basis for Averroes’ commentary (*Talkhīs Kitāb al-Ḥiss wa-l-maḥsūs*).

In addition to Arabic paraphrastic and commentary works based on these sources, much of the original Greek commentary tradition was translated into Arabic in the ninth and tenth centuries; many individual works are extant and edited. Philosophers in the Arabic tradition were familiar with the Alexandrian material, including essays in the *Mantissa* such as “On sight” (chapter 15).⁴² Individual essays from the *Quaestiones et solutiones* were also commented upon.⁴³ Themistius’ paraphrase of *De anima*, which is extant in Arabic, was quite influential.⁴⁴ Many other Greek commentaries on Aristotelian works

39 For the most recent inventories and discussion of the “translation movement,” see Dimitri Gutas, “The Rebirth of Philosophy and the Translations into Arabic,” in *Philosophy in the Islamic World*, vol. 1: *8th–10th Centuries*, ed. U. Rudolph et al., trans. R. Hansberger (Leiden: Brill, 2017): 95–142; and Cristina D’Ancona, “Greek Sources in Arabic and Islamic Philosophy,” *Stanford Encyclopedia of Philosophy* (2019): <https://plato.stanford.edu/entries/arabic-islamic-greek/>. Gutas’ seminal work on the transmission of ideas from Greek into Arabic culture has already been mentioned in n23.

40 In *Aristūṭālīs fī l-nafs*, ed. ‘Abd al-Raḥmān Badawī (Cairo: Dirāsāt Islāmiyya, 1954), 3–88.

41 The adaptation of this text attributed belief in veridical dreams to Aristotle, among other innovations: see Rotraud Hansberger, “*Kitāb al-Ḥiss wa-l-maḥsūs*: Aristotle’s *Parva naturalia* in Arabic Guise,” in *Les Parva Naturalia d’Aristote*, ed. C. Grellard and P.-M. Morel (Paris: Sorbonne, 2010), 143–62.

42 See *On Sight* (15), ed. H. Gätje, *Studien zur Überlieferung der aristotelischen Psychologie im Islam* (Heidelberg: Carl Winter, 1971), 140–72.

43 See *On colours* (1.2), ed. H. Gätje, “Die arabische Übersetzung der Schrift des Alexander von Aphrodisias über die Farbe,” *Nachrichten von der Akademie der Wissenschaften in Göttingen: Philologisch-Historische Klasse* (Göttingen: Vandenhoeck und Ruprecht, 1967): 343–82; *On Sense Perception according to Aristotle* (111.3), ed. H.-J. Ruland, “Die arabische Übersetzung der Schrift des Alexander von Aphrodisias über die Sinneswahrnehmung,” *Nachrichten von der Akademie der Wissenschaften in Göttingen: Philologisch-Historische Klasse* (Göttingen: Vandenhoeck und Ruprecht, 1978): 162–225.

44 *An Arabic Translation of Themistius’ Commentary on Aristotle’s De anima*, ed. M. C. Lyons (Thetford: Bruno Cassirer, 1973).

on psychology are attested, including Simplicius' commentary on *De anima* and the works of Theophrastus.⁴⁵

The Latin commentary literature on the *De anima* is huge, starting in the first half of the thirteenth century,⁴⁶ and that on *De sensu* considerable.⁴⁷ Many commentaries are still unedited and very few besides those of Thomas Aquinas are available in translations into modern languages.⁴⁸ The works of Albert the Great, written during the early phase of the rediscovery of Aristotle in the thirteenth century, were immensely influential, whereas the collective effort of the Coimbra commentators at the end of the sixteenth century should be mentioned for its synoptic erudition and clarity of exposition.⁴⁹

Secondary literature is enormous, but the reader might wish to start with a few seminal articles. Charles Kahn's "Sensation and Consciousness in Aristotle's Psychology" gives an excellent overview of Aristotle's account of the perceptual part of the soul; Richard Sorabji's "Body and Soul in Aristotle" is important both for making statements that came to characterise the so-called "literalist" interpretation and for distinguishing Aristotle's conception of mind from the one we inherited from Descartes; Myles Burnyeat's "Is An Aristotelian Philosophy of Mind Still Credible? (A Draft)" challenged the views of Sorabji, arguing that Aristotelian sense perception involves only spiritual and not physical change. A thorough summary of the literalism-spiritualism debate is Victor Caston's paper "The Spirit and the Letter." The collection of articles *Essays on Aristotle's De anima*, edited by Martha C. Nussbaum and Amélie Oksenberg Rorty, contains several influential articles on the subject of sense perception and remains an indispensable resource for students of Aristotle's

45 For a comprehensive list, with references to further information, see Gutas, "Rebirth," 121–35.

46 See Sander W. de Boer, *The Science of the Soul: The Commentary Tradition on Aristotle's De anima, c.1260–c.1360* (Leuven: Leuven University Press, 2013); and Ana María Mora-Márquez, "A List of Commentaries on Aristotle's *De anima* III (c.1200–c.1400)," *Cahiers de l'Institut du Moyen-Âge Grec et Latin* 83 (2014): 207–56.

47 Cf. Ebbesen, Thomsen Thörnqvist, and Decaix, "Questions," 59–115.

48 Thomas Aquinas, *Aristotle's De anima in the Version of William of Moerbeke and the Commentary of St. Thomas Aquinas*, trans. K. Foster and S. Humphries, introduction by I. Thomas (London: Routledge and Kegan Paul, 1951); id., *Commentary on Aristotle's On Sense and What is Sensed and On Memory and Recollection*, trans. K. White and E. M. Macierowski (Washington DC: Catholic University of America Press, 2005).

49 *Commentarii Collegii Conimbricensis Societatis Iesu in tres libros De Anima Aristotelis Stagiritae* (Coimbra: Typis & Expensis Antonii à Mariz Universitatis Typographi, 1598; reprinted Hildesheim: Georg Olms, 2001); *Commentarii Collegii Conimbricensis Societatis Iesu in Libros Aristotelis, qui Parva Naturalia Appellantur* (Lisbon: Ex Officina Simonis Lopesii, 1593). Both commentaries were immensely successful and came out in several new and expanded editions.

psychology.⁵⁰ Finally, we have edited a collection of essays that we hope will further the study of Aristotle's philosophy of mind.⁵¹

Stephen Everson's monograph *Aristotle on Perception* is a detailed study of Aristotle's theory of perception along the literalist line, whereas Thomas K. Johansen's book *Aristotle on the Sense-Organs* is a thorough study of Aristotle's understanding of the peripheral sense organs, supporting the spiritualist line of interpretation. Johansen's book *The Powers of Aristotle's Soul* is a comprehensive and philosophically meticulous discussion of Aristotle's psychology, putting sense perception in the context of Aristotle's account of the soul. For a detailed study of the common sense and the higher perceptual operations, one may wish to consult two monographs: Pavel Gregoric's *Aristotle on the Common Sense* and Anna Marmodoro's *Aristotle on Perceiving Objects*. On the other hand, Deborah Modrak's *Aristotle: The Power of Perception* and Stephan Herzberg's *Wahrnehmung und Wissen bei Aristoteles* focus on the role of sense perception in Aristotle's epistemology.⁵²

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50 Charles Kahn, "Sensation and Consciousness in Aristotle's Psychology," *Archiv für Geschichte der Philosophie* 48 (1966): 43–81; Sorabji, "Body and Soul"; Burnyeat, "Is an Aristotelian Philosophy of Mind"; Caston, "The Spirit and the Letter"; Martha C. Nussbaum and Amelie O. Rorty, eds., *Essays on Aristotle's De Anima* (Oxford: Clarendon Press, 1992); the paperback edition from 1995 contains an added essay by Myles Burnyeat, "How Much Happens when Aristotle Sees Red and Hears Middle C?" in *Essays on Aristotle's De Anima*, ed. M. C. Nussbaum and A. Oksenberg Rorty (Oxford: Clarendon Press, 1995), 421–34 with a further defence of his spiritualist reading of Aristotle.

51 Pavel Gregoric and Jakob Leth Fink, eds., *Encounters with Aristotelian Philosophy of Mind* (London: Routledge, 2021).

52 Stephen Everson, *Aristotle on Perception* (Oxford: Oxford University Press, 1997); Thomas Kjeller Johansen, *Aristotle on the Sense-Organs* (Cambridge: Cambridge University Press, 1997); id., *The Powers of Aristotle's Soul* (Oxford: Oxford University Press, 2012); Pavel Gregoric, *Aristotle on the Common Sense* (Oxford: Oxford University Press, 2007); Anna Marmodoro, *Aristotle on Perceiving Objects* (Oxford: Oxford University Press, 2014); Deborah Modrak, *Aristotle: The Power of Perception* (Chicago: The University of Chicago Press, 1987); Stephan Herzberg, *Wahrnehmung und Wissen bei Aristoteles* (Berlin: De Gruyter, 2011).