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Aristotle on Remembering and Memory
Toward an Interpretation of Mem. 1

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ABSTRACT

Aristotle on Remembering and Memory

At the outset of *De memoria* 1 (hereafter *Mem*. 1) Aristotle promises a scientific definition of memory, a causal account that explains how episodes of memory occur, and a clarification as to the location of memory that identifies the main part of the soul involved in the exercise of memory. All these promises are fulfilled by the end of *Mem*. 1. While Aristotle has a great deal to say on human memory, his first and foremost goal is to develop an account that explains the role of memory and remembering in animal life. This article discusses the explanatory and definitional strategies adopted in Aristotle's exploration of the phenomenon of memory. It also offers an interpretation of the whole chapter from a methodological perspective.

Keywords: Aristotle - Memory - Perception - *Aisthêma* - *Phantasia* - *Phantasma*

1. The aims of the *De memoria* and its relation to the *De anima*

No one should underestimate how difficult it is to engage critically with an ancient text without having the luxury of relying on an exegetical tradition that stretches all the way back to antiquity. The *De memoria* (along with most of the other essays collectively known as *Parva naturalia*, the *De motu animalium*, and the *De incessu animalium*) remained at the margins of the ancient critical engagement with Aristotle. With the possible exception of Alexander of Aphrodisias, this Aristotelian work was not the object of a continuous commentary in antiquity despite its obvious relevance to the philosophical discourse[1]. This leaves us with an exegetical gap that we must try if not to close at least to reduce.

Among the most obvious questions that any interpreter of the *De memoria* is expected to address one is especially pressing. We want to know why Aristotle's account of memory is not part and parcel of the study of the soul offered in the *De anima* but is rather inscribed within the project of the *Parva naturalia* delineated at the outset of the *De sensu*. We offer three observations that jointly contribute to answering this question, which has architectonic implications for how Aristotle thinks of his own research program in natural philosophy.

1. While an important aim of the *De memoria* is to explain the relation between perception, thought, and memory, the overriding goal of the work is to offer a complete account of the exercise of memory — that is, remembering — as one of the actions and affections of the *ensouled body* (aka *living body*). As such, our investigation falls squarely within the province of "what is common to the body and the soul." Aristotle employs this expression to refer to the explanatory project attempted in the *Parva naturalia*[2].
2. Furthermore, remembering is an activity that has *zoological* significance since both human and non-human animals engage in this activity. As a result, the *De memoria* is best understood as contributing to a study of *animal psychology*. However, such a study is not an independent scientific project, let alone a separate science, for Aristotle; rather, it contributes, directly and immediately, to his study of animals. It is important to stress that "animal psychology" is to be understood in a way that does not exclude the human being. The term refers to the set of psychological features that are common, and indeed basic, to all living beings capable of remembering[3].
3. The power of remembering (*mnêmoneuein*) — that is, the power that can be traced back to memory (*mnêmê*) — is not on a par with the power of perception (*aisthesis*) and the power of thought (*nous*). By Aristotle's lights, perception and thought are not only *powers* but also *parts* of the soul. They are parts of the soul in the first place because they are "separate in account".

> As such, they can be defined independently from one another and from other powers such as memory. As parts of the soul, perception and thought (along with the so-called nutritive part of the soul) are definitionally separate sub-principles which jointly constitute the first principles of Aristotle's study of living things[4]. The explanation of all phenomena of all living things — not only the explanation of their bodies but also of the things that living beings passively undergo or actively do (that is, their "actions and affections") — presuppose a reference to one (or more than one) of these parts of the soul. In this sense, the study of the parts of the soul (offered in the *De anima*) provides Aristotle with the first principles from which all the theorems of his study of living beings depend for their ultimate explanatory foundation. As the place of the study of remembering within Aristotle's larger explanatory project shows, animal psychology is no exception to the rule.

This third and final observation calls for a few additional words of elaboration. That the power of memory is not on a par with the basic capacities of the soul becomes clear as soon as we reflect on Aristotle's uncontroversial but important observation that we first perceive (or think) something and then remember having perceived (or having thought) it (*Mem.* 1, 449b15-20). This observation shows that memory cannot be adequately grasped, and indeed explained, without reference to perception or thought. We will elaborate further on the significance of this observation in due course (Section 3). For the time being, it is enough to stress that Aristotle's explanation of memory requires systematic references not only to perception but also to another power discussed in the *De anima*, namely *phantasia*[5]. Reflecting on the dependence of memory on perception and *phantasia* helps us see why the investigation advanced in the *De memoria* is conducted squarely within the theoretical framework provided by the *De anima.* But while we appreciate the theoretical continuity with the *De anima,* we must refrain from thinking of the *De memoria* as a sort of completion of the project attempted in the *De anima*. The *De memoria* is best understood as an *application* of the main results reached in the course of study of the soul.

At this point we are ready to turn, briefly, to the opening statement of the *De sensu*, where Aristotle negotiates the transition from the study of the soul to the project attempted in the short essays collectively known as *Parva naturalia*. This transitional passage is carefully crafted to convey the message that the study of the soul (conducted in the *De anima*) is over. By Aristotle's lights, this study lacks nothing. As a result, Aristotle is now ready to move on, and indeed forward, with his overall research program. What comes next in his research agenda is best understood as *another kind* of investigation. Aristotle is very clear on this point:

> *[s]ince we earlier completed a study of the soul as such and of each of its powers taken as a part of the soul, it is next to be investigated about animals and everything that has life – what are their specific and what are their common activities* (praxeis)*. Let us, therefore, assume what was said about the soul and let us speak about the rest and first about what is first.* (*De sensu* 1, 436a1-6)

A full discussion of the architectonic significance of this transitional passage goes beyond the scope of this essay[6]. What matters for our present concerns is that Aristotle's research focus is shifting from one kind of investigation — concerned with the *soul as such* and its fundamental powers taken as *parts of the soul*[7] — to another kind of investigation. Aristotle describes this new investigation as the study of *animals* and *everything that has life*[8]. What Aristotle says in the final sentence confirms that his study of the soul is meant to provide the starting points (the Aristotelian technical term is *archai*) for this new investigation. We can restate this last point by saying that, at this stage of his scientific inquiry, Aristotle has reached the *definition* of the first principle of life (that is, the soul as such) and is now ready to turn to the *explanation* of the activities (*praxeis*) of the things that have a soul.

Understanding the above distinction is important for our view of the division of labour between the *De anima* and the so-called *Parva naturalia*. On our view, there is no tension, or thematic overlap, between the *De anima* and the *Parva naturalia* on account of the fact that both works offer discussions of perception (*aisthêsis*). The definition of the *power* of perception offered in the *De anima* is the definition of a first principle (*explanans*), while the *De sensu* (as a part of the *Parva naturalia*) offers the scientific account (*explanatio*) of the phenomena related to perception — of episodes of perception, of the bodily parts required for perception, *et cetera*. The latter result is reached by means of the *explanans* defined in the *De anima*, that is, by applying it to the explanation of the phenomenon of perception in living beings endowed with the power of perception. Thus, the fact that perception is studied both in the *De anima* and in the *Parva naturalia* is exactly as it should be. The *De anima* deals with the definition of perception as one of the basic powers of living things, while the essays jointly trasmitted as part of the *Parva naturalia* deal with the explanation of the workings of these principles and everything that follows from them in the things that *have* soul (the ensouled things)[9]. Animals (*zôia*) are a large group of such ensouled things, to which Aristotle is now ready to turn.

2. Exploratory and definitional strategies in *Mem.* 1

> *With respect to memory and remembering we must say what memory is, on account of which cause it takes place, and to which part of the soul this affection belongs.* (*Mem*. 1, 449b3-6)

Aristotle's opening statement signals a commitment to giving a full explanation of the phenomenon of memory and remembering. The significance of the mention of remem-

bering (*mnêmoneuein*) next to memory (*mnêmê*) will become apparent in due course. For the time being, it is more urgent to stress that the promise made at the beginning of his investigation commits Aristotle to supplying not only an *explanation* of how episodes of memory are possible but also a *definition* of the phenomenon of memory[10]. This feat, which is at the same time explanatory and definitional, is achieved by the end of *Mem.* 1. The explanatory and definitional strategies adopted in this chapter call for a few words of elaboration. To fully appreciate them, however, we need to offer a few preliminary remarks on the system of causes that Aristotle employs in investigation of memory as well as on the definitional procedures that he adopts in approaching this phenomenon. Let us begin our remarks with the system of causes that Aristotle employs in the study of memory. Scholars refer to this system as Aristotle's *doctrine of the four causes*[11]. This doctrine does not single out causes in the modern (that is, Humean) sense. Rather, it outlines four different explanatory roles that an item can play in all kinds of explanations. This is also why we can represent these causes in terms of different answers to different kinds of why-questions. By Aristotle's lights, the four causes exhaust all possible answers to all possible why-questions. In this sense, they cover all kinds of explanatory role that a cause can play in a scientific investigation (*Phys*. 195a3-4 combined with b28-30). The Aristotelian causes are:

1. *The material cause* or that which is given in answer to the question "What is it made of?"
   The things singled out in the answer need not be material objects such as bricks, planks, or stones; they can also be words or premises-in short, everything out of which something is made.
2. *The formal cause* or that which is given in answer to the question "What is it?"
   The thing singled out in the answer is the essence or what-it-is-to-be something. Here too there is no restriction to what can be singled out.
3. *The moving cause* or that which is given in answer to the question "Where does the change (or movement) come from?"
   The moving (aka efficient) cause is the whence of motion. This cause comes closest to the modern (that is, Humean) idea of causation[12].
4. *The final cause* is that which is given in answer to the question "What is it good for"?. The thing single out in the answer is that for the sake of which something is done or takes place.

If we now take a fresh look at the opening statement of the *De memoria* with the Aristotelian system of the four causes in place, we see that Aristotle is announcing an answer to at least three of the four questions that one may informatively ask with respect to any object of scientific study. More directly, at the outset of the *De memoria*, Aristotle is promising to provide us with the following causes:

> *The formal cause,* introduced by the question "What is memory?".
> *The moving cause,* announced by the question "On account of which cause do episodes of memory take place?".
> *The material cause,* indirectly introduced via the underlying subject of memory, by the question "To which part of the soul does this affection belong?[13] ".

This, if true, means that Aristotle plans to give us a full scientific account of memory, with the conspicuous exception of the final cause. The absence of the final cause calls for a few words of comment. A reference to this cause is absent because Aristotle thinks that the phenomenon of memory does not have a final cause. This does not mean, we hasten to add, that there is no purpose for the sake of which animals remember things in the sense that memory is not *useful* to them. It only means that memory is not a natural goal of animal growth or any other natural process. Rather, memory is something that comes to pass in animal organisms once they are fully formed.

The feature of being natural without having a final cause is quite typical of the phenomena studied in the set of treatises collectively known as *Parva naturalia*. For instance, this holds of the phenomena of perception as they are studied in the *De sensu*. The *De sensu* does not engage in a treatment of the final causes of the phenomena of perception even though in the *De anima* perception was already defined as a part of the soul and hence as a final cause of animal structures and processes. Explanations by reference to final causes are — we claim — argely absent in the rest of the *Parva naturalia*. Consider the phenomenon of sleep as discussed in the *De somno*. Although hypothetically necessary as an enabling condition for the state of waking (and therewith of perception), sleep does *not* have an immediate final cause. In this respect, sleep is exactly parallel to the phenomenon of remembering: it does *not* occur in order to bring about (or so as to bring about) a certain natural goal; rather, it comes to pass in animal organisms by way of certain material and efficient causes.

We will not engage in a full discussion of the other phenomena that are studied in the *Parva naturalia*. What matters for our present discussion is that Aristotle aims at a comprehensive causal account of the phenomenon of memory and that this comprehensive account does not involve a natural goal. This result is sufficient to secure that the project attempted in the *De memoria*, and indeed in all the other short essays collectively known as *Parva naturalia*, is a different kind of project from the one conducted in *De anima*. While the latter aims at a *definition* of the first principles that serve as the basic explanans of the phenomena of living things, the short essays collected in the *Parva naturalia* purport to arrive at an *explanation* of phenomena such as memory or sleep by way of causal accounts that are ultimately grounded on the results achieved in the *De anima*.

Let us now turn to the definitional procedures deployed in *Mem.* 1. Aristotle offers *two definitions* of memory. Neither one is expendable, but they do not play the same role in Aristotle's overall argument. The first definition can be extracted from *Mem.* 1,

449b24-25. It is *an interim definition*. As such, it is a first but crucial step in the overall argument of the chapter because it captures some salient feature of memory and remembering. It provides Aristotle with a firm basis on which to launch the subsequent investigation. In the Aristotelian tradition, scholars often refer to this sort of definition as a nominal definition[14]. We stop short of adopting this language because the initial definition of memory is not presented as the definition of a name (*onoma*). Rather, it is achieved in a few brisky strokes that do not require committing to any theoretical machinery. On the contrary, at this early stage of the argument, we only need to accept that remembering is being aware of something that lies in the past (*Mem*.1, 449b15)[15].
Aristotle's second definition can be extracted from *Mem.* 1, 451a14-17. This definition marks the end of the treatment of memory and remembering. As such, it is *the final definition* of memory and remembering. It contains a crucial reference to the causal role that images (hereafter *phantasmata*) play in Aristotle's causal account of how episodes of memory occur. This reference provides a clue as to how an episode of memory connect the present object of memory to a past experience.
It has long been observed that Aristotle offers two definitions of memory in *Mem.* 1. However, this observation has never been followed up by an attempt to explain the methodological significance of this definitional procedure[16]. We would like to suggest that there is nothing idiosyncratic in the investigation conducted in the *De memoria.* Quite the opposite: Aristotle's practice of scientific inquiry always proceeds in stages[17]. At least in this respect, the search for a scientific definition, and corresponding explanation, of memory and remembering is not an exception to the rule. Rather, it confirms that Aristotle is consciously adopting a certain style of inquiry in his scientific enterprise. This style of scientific inquiry is outlined in the second book of the *Posterior Analytics*. At the most general level, Aristotle is first required to delineate the relevant *explanandum* with the help of an *interim* definition and only then is expected to engage in the search for the relevant explanation. We can restate this point by saying that the *interim* definition of memory marks the end of *the pre-explanatory stage of inquiry*. Scholars often refer to this first moment of the scientific inquiry as the *hoti*-stage of inquiry. The final definition captures the most salient elements of the explanation of the phenomenon of memory. In this sense, it encapsulates the explanatory success reached at the *dioti*-stage of investigation in a memorable way[18].

3. The first definition of memory

The first definition of memory can be extracted from the following passage:

> *Memory* (mnêmê) *is neither a perception* (aisthesis) *nor a conception* (hypolêpsis)*, but it is having* (hexis) *either one of them, or it is an affection* (pathos) *arising from one of them, when some time has elapsed. (Mem. 1, 449b24-25)*

Conception (*hypolêpsis*) is a carefully chosen word. It covers a range of possible mental phenomena. What these phenomena have in common is that they presuppose the capacity for discursive thought (*dianoia*)[19]. Considering this, the interim definition of memory can be formulated as follows:

> Interim Definition of Memory: *Memory is having a perception or a thought, or it is an affection arising from one of them when some time has elapsed*[20].

In our formulation, the initial definition of memory refers to actual rather than potential remembering. In other words, we take *hexis* to be referring to an activity rather than a disposition[21]. What is at stake is whether Aristotle is primarily concerned with memory understood as a dispositional capacity. Our rendering of the *interim* definition of memory rules out that the initial focus is a disposition. The phenomenon that is demarcated at the outset of Aristotle's investigation is a certain kind of awareness, which is initially described as an awareness of something that lies in past. This is important since memory is often understood as a capacity for storing information. For Aristotle, however, memory is first and foremost the act of remembering something. Hence it is first and foremost an activity. It is the occurring event of having something in mind and having it as something that lies in the past. In light of this, we venture to say that Aristotle is primarily concerned with what we nowadays call "episodic memory."

Aristotle's focus in *Mem.* 1 is on the *conscious remembering* of stored information. Whenever one is active with respect to remembering, *one says in the soul* that one has previously heard, perceived, or thought (*Mem.* 1, 449b22-23, our emphasis). It does not take long to see that the *interim* definition of memory does not only delineate a particular phenomenon, but it also sets up an explanatory agenda for Aristotle. The information that was originally available in the form of either an object of perception or an object of thought is now available in the form of an object of memory. Restating the point in this way helps us see that the most pressing question that Aristotle is expected to answer — and indeed his primary task in *Mem.* 1 — is to explain how the present object of memory and the past object of perception (or thought) are related.

At this early stage of his argument, Aristotle is content to say that whenever one remembers one has knowledge or perception *without performing the relevant activities* (*Mem*. 1, 449b18-20, our emphasis)[22]. The account of memory offered in *Mem*. 1 will have to close the gap that Aristotle himself has opened between the *past* activities of perceiving and thinking and the *present* activity of remembering. We will see that *phantasma* is the crucial element in the account of memory which allows Aristotle to bridge this gap between the past object of perception (or thought) and the present object of memory.

There is at least another aspect of the initial definition of memory that calls for a few words of comment. One may be tempted to take the *interim* definition to highlight two alternative scenarios for us: *either* memory consists in having (*hexis*) a past object of

perception (or thought) in front of us *or* it is an affection (*pathos*) arising from one of them. We can safely rule out such an exclusive reading if it entails that memory can only be either one or the other—namely, *either* having a past object of perception (or thought) in front of us *or* being an affection that arises from one of them. But we cannot rule out this reading if it is taken in a weaker way to mean that *at different points in time* memory is one of the two. Considering this, a limitative reading is a much safer exegetical option. At this early stage of his inquiry, Aristotle is keeping his options open. We can restate this point by saying that memory is a case of having a past object of perception (or thought) in front of us *or* an affection arising from one of them. When we read the text in this way, we are no longer required to choose between the alternatives outlined for us, since it may well turn out that memory is *both* having something in front of us *and* an affection arising from either perception or thought. At this stage of the investigation, we simply do not know. Progress on this front can be made only by looking at how the overall argument unfolds in the rest of the chapter. Once again, the deployment of the concept of *phantasma* will turn out to be crucial in this context.

4. Perception, *phantasia*, and memory

Progress in the explanation of memory depends on the introduction of *phantasia* understood as the power to present the soul with a *phantasma*. So it is not surprising to discover that Aristotle's first move out of the blocks, as soon as the *interim* definition of memory is in place, consists in recalling the results achieved in the *De anima* on the topic of *phantasia*. Although Aristotle deals with *phantasia* in the *De anima*, he does not consider this capacity on a par with perception and thought. Aristotle never says that *phantasia* is a part of the soul like perception or thought. By his lights, *phantasia* is not separable in account from perception and thought. Rather, his view is that *phantasia* is a *side effect* of the exercise of the power of perception. As soon as we reflect on this fact, we realize that the power of *phantasia* cannot be defined independently of perception[23]. In *Mem.* 1, Aristotle is not content to refer his reader to the *De anima* for his treatment of *phantasia.* Rather, he goes on to say that it is not possible for us to engage in thinking without *phantasmata* (*Mem*. 1, 449b31-450a1). Most interpreters of *Mem*. 1 refer the reader to the *De anima* for textual support for this second claim[24]. But while it is true that the claim is first made in the *De anima*[25], there is no evidence that Aristotle is referring his reader to the *De anima* for this claim. On the contrary, the *gar*-clause that immediately follows contains a fresh set of considerations in support of the claim that thinking requires *phantasmata* but cannot be reduced to them. They are all considerations based on mathematical thinking, which is taken to be a case study for better understanding the role of *phantasmata* in the context of human thinking. When we prove a geometrical theorem about triangles — e.g., the theorem that the sum of the internal angles of any triangle are equal to two right angles (in short, 2R) — we draw the diagram of a triangle

on the blackboard or in the sand. This diagram always has a particular size even if the geometrical proof does not depend on the triangle having any specific size but rather depends on the fact that the triangle is a closed figure on a surface bounded by three rectilinear sides. Likewise, the operation of human thinking is always accompanied by *phantasmata*; however, these *phantasmata* are only incidental on human thinking.

What Aristotle says in *Mem*. 1 complements the various scattered remarks on *phantasmata* offered in the *De anima.* It also helps us see that a *phantasma* is needed for visualizing the object of thought while at the same time it does not directly contribute to the content of thinking[26]. This negative result on the relation between thinking and *phantasmata* must be complemented with the positive conclusion that Aristotle reaches in *Mem.* 1. A *phantasma*, Aristotle says, is an affection (*pathos*) of the common sense (*Mem.* 450a10-11)[27]. Interestingly enough, Aristotle never makes this claim in the *De anima*. He makes it here in *Mem*. 1 as part of his attempt to elaborate on the characterization of memory in terms of awareness of time. By now it is clear that the awareness in question is a form of *perceptual awareness* since it is closely connected with the formation of *phantasmata* (recall that for Aristotle a *phantasma* is a by-product of an act of perception).

While we still do not know how a *phantasma* can help us connect the present object of memory to the past object of perception (or thought), we can appreciate the progress made so far. The activity of remembering was originally introduced as the conscious remembering in which *one says in the soul that* one has previously heard, perceived, or thought (*Mem.* 1, 449b22-23, our emphasis). At the end of this difficult stretch of text Aristotle restates his original point. But this time he is significantly more precise as to the kind of awareness involved in the exercise of memory: whenever one is active with respect to memory *one is also perceptually aware* (*prosaisthanetai*) that one saw, heard, or learned something at an earlier time (*Mem.* 1, 450a19-21, our emphasis).

The connection that Aristotle establishes between memory and perception explains why he is confident that non-human animals can remember past experiences. More directly, if memory were intrinsically associated with the capacity for thought and thinking, then non-human animals would be barred from memory. But since memory is linked to the perceptual capacity, it is at least in principle available to all those animals that are perceptually aware of time (*Mem*. 1, 450a16-19). The zoological orientation of Aristotle's account of memory is firmly in place at this stage of the argument. While the investigation has been conducted by focusing on the case of human memory, the conclusion is meant to apply to both human and non-human animals.

This conclusion raises the issue of how non-rational animals can come to be aware of time. The most plausible way of accommodating *a non-rational experience of time* into the Aristotelian framework is to credit animals with a *perceptual awareness of the temporal distance* that lies between the present occurrence of a memory-triggering episode on the one hand and the remembered episode on the other. This experience is simi-

lar to, but at the same time cognitively significantly less demanding than, the standard Aristotelian conception of *the conceptual experience of time*, which involves the notion of a *measured* temporal distance (*Phys*. IV 14, 223a21-29). Such a measuring requires the concept of *number*, which is not available to non-rational souls. As a result, non-rational animals are barred from experiencing time via the notion of number (regardless of how inchoated this notion may be). But these animals can still experience the *magnitude* involved in the time distance. More to the point: they can do so in a subjectively unquantified way[28]. Think of Argos, the dog that Odysseus trained and brought up as a puppy before sailing off for Troy. Argos has grown old in the absence of Odysseus. And yet, the loyal dog is still able to recognize his master when he returns disguised as a beggar. More to the point: Argos is aware that quite some time has elapsed since he has seen his master last time-so much so that this whole experience is fatal to him. Argos passes away as soon as he has recognized his master (*Od*. 17.290-327).

Aristotle does not refer to the touching story of Argos, the loyal dog of Odysseus, but his account of memory is surely expected to provide us with the conceptual resources to make sense of this story. In the context of this essay, we will not elaborate further on this story, or how Aristotle would like to account for it. It is more pressing for us to underscore another important result that Aristotle has been able to secure by linking memory to a *phantasma* and by making the *phantasma* an affection of the common sense. Recall that at the outset of his investigation Aristotle has promised a clarification as to the *underlying subject* of an episode of memory. At this stage of the argument, we can safely say that the primary underlying subject of an episode of memory is *the first perceptual power* (Aristotle calls it the *prôton aisthêtikon*). This result is secured when we are told that "memory is incidentally of thought (*nous*), but it is *per se* of the primary perceptual capacity (*Mem.* 1, 450a14).

5. The *phantasma* and the *aisthêma*

The *interim* definition of memory and remembering has highlighted two alternative scenarios for us: *either* memory consists in having (*hexis*) a past object of perception (or thought) in front of us *or* it is an affection (*pathos*) arising from one of them. With the introduction of the *phantasma* as an affection (*pathos*) of the common sense, we see that we are not really forced to choose between these two scenarios. The *phantasma* understood as an affection (*pathos*) that pertains *per se* to the primary perceptual capacity is that which we are having (*hexis*) in front of us when we are remembering something. In this sense, the object of memory is not something distinct from the *phantasma.* On the contrary, it is identical with a *phantasma* (in a way to be explicated below)[29].

Aristotle makes this point when he says that the objects of memory are essentially (*kath'hauta*) of those objects of which there is *phantasia* and are only incidentally (*kata sumbebêkos*) of those which are not without *phantasia* (*Mem*. 450a23-25).

While it is true that Aristotle is concerned with dissociating memory from the capacity for thought, it is also clear that he is interested in associating it with the primary perceptual capacity understood as the capacity to produce *phantasmata*.
At this stage of his inquiry, Aristotle turns to a question that has been on his agenda at least since the formulation of the *interim* definition of memory and remembering. Aristotle does so by raising the following *aporia*:

> *But one might wonder* (aporêseie) *how in the world* (pôs pote) *when the affection* (pathos) *is present, while the thing is absent, one remembers what is not present. (Mem. 1, 450a25-27)*

This *aporia* (introduced with a rather emphatic *pôs pote*), contains a request to spell out how the *phantasma*, which is an affection that is currently present in the perceptual part of soul, can refer to something that is no longer present to us. Aristotle's positive treatment of memory will emerge from an in-depth discussion of the question. Aristotle responds to this *aporia* by outlining a causal story that explains how the *phantasma* is connected to the original experience. More directly, Aristotle says that the *phantasma* is an affection (*pathos*) that is produced by means of an act of perception in the part of the body that contains the <perceptual> soul (*Mem*. 1, 450a27-29)[30]. In blooded animals, this part is the heart; in bloodless animals, it does not have a name but is described as something that is functionally analogous to the heart. Aristotle describes the *phantasma* as a change that arises in coincidence with an episode of perception. No temporal space seems to separate the act of perception from the production of a *phantasma*. Rather, the normal operation of perception results in the production of a percept (*aisthêma*) as well as an image (*phantasma*). In this sense, the *phantasma* is best described as a *side effect* rather than as an *after effect* of an act of perception[31].
For Aristotle, *phantasmata* are *remnants* of the process of perception since they persist in the body after the event of perceiving is over. More precisely, *phantasmata* are perceptual stimuli stored in the relevant part of the body (the heart or its analogue in bloodless animals). They preserve the causal powers and, in this way, also the presentational qualities of the original acts of perception. But unlike percepts (*aisthêmata*), which are firmly tied to the external objects, *phantasmata* lose the presentational ties to the external objects that brought them about and become available for new intentional contexts such as memory, anticipation, association, or rational thought. This is possible because *phantasmata* can, as it were, resurface and can be perceived anew (*Insomn.* 2, 460b2-4). In that case, they can have the same, or at least very similar, effects as the original percepts (*An*. III 3, 428b10-19, *Rhet.* I 11, 1370a28-29). This is to say that the *phantasmata* can stand in for objects as well as for features of objects that are currently not available to the senses[32]. However, the *phantasmata* themselves are not the moving causes of their re-activation; rather, they are causally passive and require the presence of an external moving cause to stir them up, as it were, and to

bring them before the perceptual capacity (*to aisthêtikon*). The moving cause of such a re-activation can be purely causal—for instance, a hot stove that makes a sleeping dog in its vicinity dream of a fire; or it can be teleologically guided, as in the case of human deliberation or theoretical thinking[33].

For Aristotle, the change that occurs in an act of perception and results in an *aisthêma* is also imprinted in a *phantasma*. Aristotle goes on to say that the *phantasma* is like a kind of impression (*typos*) of the *aisthêma* (*Mem*. 1, 450a30-32). The relation that Aristotle envisions between the *phantasma* and the *aisthêma* is illustrated by means of the analogy with a signatory who uses a signet-ring to impress a seal on a letter or on some other important document. This analogy is open to more than one reading. On our reading, the analogy is meant to convey the idea of the existence of a causal relation between the *aisthêma* and the *phantasma*. It is not meant to convey the additional idea that there is a privileged connection between the *phantasma* and the *aisthêma*. In other words, the causal story that leads to the imprint of a *phantasma* in the soul explains the properties of the *phantasma.* However, this causal story does not determine what the *phantasma* represents. Whether the *phantasma* represents something, and eventually what, depends on the subsequent *use* that the soul makes of the *phantasma.* We today say that this outcome depends on the *intentional context* in which a *phantasma* (or a sequence of *phantasmata*) occurs. One of such contexts is memory.

If we are right, a *phantasma* is not representational in character. A *phantasma* may well represent nothing at all. By our lights, a *phantasma* only brings its own qualitative features before the soul. This is also why we resist the translation of *phantasma* with "image" (and the translation of *phantasia* with "imagination"). Of course, a *phantasma* may become the representation of something. To explain how this happens, Aristotle employs another analogy. We briefly discuss this second analogy in the next section.

6. The final definition of memory and remembering

In the final part of *Mem.* 1, Aristotle builds on the idea that a *phantasma* is connected to something else with the help of another analogy. He compares the *phantasma* to a figure (*zôion*) painted on a panel. According to Aristotle, we can look at the painted figure in at least two ways: we can look at it either as just a figure (*zôion*) or as a *representation* (*eikôn*) of something else. When we do the latter, we connect the figure to something beyond its intrinsic properties (shape, colour, and the like). Likewise, we can take a *phantasma either* as what it is in itself *or* as a representation (*eikôn*) of something. When we take the *phantasma* in this second way, we take it as referring to something beyond itself. Moreover, when we do so, the *phantasma* is "like a picture (a representation) and a memory impression (*Mem.* 1, 450b25-27).

The causal account of the formation of a *phantasma* combined with the conceptual work that has allowed Aristotle to distinguish the *phantasma* with all its intrinsic properties from the *phantasma* as a representation of something else beyond itself turn out to be the decisive step toward the final definition of memory and remembering. This definition can be extracted from the *explicit* of the chapter:

> *We have said what memory and remembering are, namely the state of having an image* (phantasma) *regarded as a representation* (eikôn) *of that of which it is an image* (phantasma)*, and <we have said> to which part in us memory belongs, namely to the first perceptual capacity and to that with which we perceive time (Mem. 1, 451a14-17).*

The final definition of memory and remembering can be reformulated in the following terms:

> Final Definition of Memory: *Memory and remembering is having an image* (phantasma) *regarded as a representation of that of which is an image* (phantasma)[34].

Like the *interim* definition, the final definition of memory is primarily concerned with the activity of remembering understood as having something in front of us. This confirms that not only the definiendum but also the explanandum of *Mem*. 1 i*s the conscious activity of remembering stored information*. Both human and non-human animals can engage in this activity. It is worth stressing that this is an activity that is cognitively more demanding than perception, since it is the perceiving of an image (*phantasma*) *as* a representation (*eikôn*) of something else from the past plus a concurrent awareness of the elapsed time.

The explanation, and indeed the definition, offered in *Mem*. 1 has zoological significance. It mentions the key ingredient in the explanation of human as well as non-human episodes of memory—namely, the *phantasma.* The *phantasma* as a representation of something else is the *formal cause* of memory and remembering. At this stage of the argument, we also have a causal mechanism in place that allows us to explain not only how a *phantasma* is formed (and indeed where it is formed) but also how a *phantasma* understood as something that is present now to the soul can be a representation of something that lies in the past. In this sense, the *phantasma* can also feature as a *moving* (aka *efficient*) *cause* of an episode of memory. But how about the material cause of memory and remembering? To the extent that the account of memory singles out where the *phantasma* is formed — namely, the heart (or whatever is analogue to the heart in bloodless animals) understood as the seat of the primary perceptual power-the Aristotelian account gives us *the material cause* of an episode of memory (or at least something that is analogue to it-that is, the underlying subject or *hypokeimenon*). Having arrived at this point, we not only see that all the promises made at the outset of the investigation have been fulfilled but we also see how a full explanation plus a scientific definition of the phenomenon of memory is available to us.

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* All translations from the Greek are ours

1. In the context of his own account of the soul, in dealing with *phantasia*, Alexander of Aphrodisias briefly alludes to a separate treatment of memory and recollection (Alexander, *An*. 69.20). Scholars have interpreted this allusion as a reference to a possible commentary by Alexander on the *De memoria*. While we have no reasons to doubt this cross-reference, it is far from clear that it is a reference to a continuous commentary on the Aristotelian work. The earliest Greek commentary on the *De memoria* is by the Byzantine author Michael of Ephesus (12th century AD). This commentary can be found in volume XXII.1 of the series *Commentaria in Aristotelem Graeca* (Wendland P (ed.), *Michaelis Ephesii in Parva naturalia commentaria. Commentaria in Aristotelem graeca XXII.1*. Berlin: Reimer; 1903). Michael appears to be better informed than he usually is, so it is tempting to suggest that he is relying on the lost work by Alexander. One may resist this suggestion on the ground that Michael conceives of his task as that of filling out a lacuna left in the commentary tradition. For this reason, he does not write on the *De sensu* because an extant commentary by Alexander is available to him (and to us). By contrast, he writes his scholia on the *De memoria* because he does not know of a commentary (or something comparable) by Alexander. We suspend judgment on this interpretative issue. We only note that a full study of the possible sources of Michael (who never explicitly refers to Alexander in his scholia) is a desideratum of scholarship.
2. *De sensu* 1, 436a7-8. Aristotle uses the same expression in the *De anima* to refer to the *De motu animalium* (An. III 10, 433b20). Evidently, Aristotle considers the *De motu animalium* part and parcel of the explanatory projected attempted in the Parva naturalia. For a discussion of the relation between the *De motu animalium* and the *Parva naturalia*, we refer the reader to Corcilius K, Primavesi O, Aristoteles. *De motu animalium*. Historisch-kritische Edition des griechischen Textes und philologische Einleitung von O. Primavesi; deutsche Übersetzung, philosophische Einleitung und Kommentar von K. Corcilius. Hamburg: Meiner; 2018. pp. CLXX-CLXXVI.
3. It is a general methodological feature of Aristotelian science that the more universal phenomena of a given scientific domain are dealt with before the less universal ones. All explanations in Aristotle's biology are in this way "commensurately universal" (*prôton katholou*). More directly, they are as universal as possible (applying as broadly as possible and covering the greatest extension of the phenomenon) while sufficiently specific to capture the features of the phenomenon under discussion. See *APost*. I 4, 73b25-74a3; *APost*. I 5, 74a32-b3; *PA* I 1, 639a15-b5; *PA* I 4, 644a25-b15. Cf. *Phys*. I 7, 189b31-32, *DA* I 1, 402b8-10. The same goes for the phenomenon of remembering, which is found not only in human beings but also in non-human animals. For this reason, it is dealt with in the context of Aristotle's zoology. This may raise the question as to why Aristotle discusses the phenomenon of recollection (*anamnêsis*), which only occurs in human beings, in that same context (*Mem*. 2, 453a8-9, we would like to thank one of the two anonymous readers for prompting us to clarify our stance on this issue). Here, the answer seems to simply be methodological economy. Recollection is more specific than remembering, but it is also cognate to it; indeed, recollection presupposes and implies memory (basically, it is a willful recalling of given pieces of memory). Hence, it makes good sense for Aristotle to deal with this phenomenon in a commensurate universal way that concerns only the specific population capable of recollection, while at the same time staying close to the basic phenomenon of remembering. This is

exactly what happens in *Mem*. 2, which is a separate chapter specifically dedicated to the explanation of recollection.

4. On the distinction between parts (*merê*) and capacities (*dunameis*) of the soul, and the relation between being separable in account and being a part of the soul, see Corcilius K, Gregoric P, Separability vs Difference: Parts and Capacity of the Soul in Aristotle. OSAPh 2010;39:81-119.
5. As will become clear in due course, for Aristotle, the relation of memory to thought and thinking is mediated via phantasia.
6. For an in-depth discussion of the opening paragraph of the *De sensu*, we refer the reader to Johansen K, What's new in the *De sensu*? The Place of the De sensu in Aristotle's Psychology. In: King RHA (ed.), Common to the Body and the Soul: Philosophical Approaches to Explaining Living Behaviour in antiquity. Berlin: Walter de Gruyter; 2006. pp. 140-164.
7. There is no abstract entity over and above the basic powers of the soul. Hence, at the outset of the *De sensu*, Aristotle is not envisioning an investigation of the soul as such followed up by an investigation of its basic powers (that is, parts); his view is rather that the study of the basic powers of the soul amounts to a study of the soul as such. In other words, the only way to study the soul is via a serial study of its basic powers.
8. We leave the significance of the reference to "everything that has life" aside. More on this reference in: Falcon A, La longevité comparée des plantes et des animaux selon Aristote. ArchPhilos 2021;84(2):13-28.
9. For further discussion of the relation between the *De anima* and the so-called *Parva naturalia*, see Corcilius K, Primavesi O, ref.2, pp. CLXVIII-CLXXXIII.
10. Aristotle goes on to add that the same must be done for recollection (449b5-6: *anamimnêskesthai*). His account of recollection (offered in *Mem*. 2) remains outside the scope of this essay.
11. For an introduction to the Aristotelian theory of causality, with an updated bibliography, see Falcon A, Aristotle on Causality. In: Zalta E (ed.), The Stanford Encyclopedia of Philosophy (URL = https://plato.stanford.edu/archives/spr2019/entries/aristotle-causality/); 2019 (online, open access entry).
12. We hasten to add that even the moving cause remains significantly different from a Humean cause. We can drive this point home as soon as we reflect on the fact that Aristotle is comfortable referring to the body of knowledge that constitutes an art or a craft (*technê*), rather that the artisan or craftsperson (*technitês*) as the first moving cause. For a perceptive discussion of the Aristotelian moving (aka efficient) cause, we refer the reader to Tuozzo ThM, Aristotle and the Discovery of Aristotle's Efficient Causation. In: Schmalz TM (ed.), Efficient Causation: A History. Oxford: Oxford University Press; 2014. pp. 23-47. As for the causal efficiency of *phantasmata*, here suffice it to say that Aristotle conceives of *phantasmata* as processes (*kinêsis*) which are qualitative in nature (just as perceptions are). As such, *phantasmata* have the power to act as causes of further (e.g., thermic) changes in the animal organism, whenever the animal experiences them as pleasant or painful. The causation of animal movement by perception and *phantasia* is described in *MA* 7, 701a34-8, 702a21.
13. The reference to the material cause can only be indirect via the underlying subject. A phenomenon like memory cannot have, strictly speaking, matter since it is not a hylomorphic compound in the way in which an artifact or a natural substance is. As a result, it can only have something that plays a role analogous to matter-that is, the underlying subject (the *hypokeimenon*). For an illuminating reflection on the distinction between matter and

underlying subject (understood as an analogue to matter) in natural processes such as sleep and memory, see *A*, The 'Matter' of Sleep. In: Ebrey D (ed.), Theory and Practice in Aristotle's Natural Science. Cambridge: Cambridge University Press; 2015. pp. 11-45.

14. The seminal papers on nominal definitions and its implications for Aristotle's theory of the scientific inquiry, are Bolton R, Essentialism and Semantic Theory in Aristotle: *Posterior Analytics* II 7-10. PhR 1976;85:514-544 and Bolton R, Definition and Scientific Method in Aristotle's *Posterior Analytics* and *Generation of Animals*. In: Gotthelf A, Lennox JG (eds), Philosophical Issues in Aristotle's Biology. Cambridge: Cambridge University Press; 1987. pp. 120-166. See also Demoss D, Devereux D, Essence, Existence, and Nominal Definition in Aristotle's *Posterior Analytics* II 8-10. Phronesis 1988;35:133-154 and, more recently, Charles D, Aristotle on Meaning and Essence. Oxford: Oxford University Press; 2000. pp. 23-56.
15. Rachel Parsons, in her PhD dissertation (Parsons RG, Aristotle on Remembering and Recollecting. PhD Dissertation. Princeton: Princeton University; 2016), argues that, at the outset of the *De memoria*, Aristotle is tacitly adopting the methodology outlined in the *De anima*. The textual basis for this reading is Aristotle's statement that we ought to study memory by looking at its object (*Mem*. 1, 449b9). On this alternative reading, the opening move of *Mem*. 1 would be in methodological continuity with the study of the soul, where all the basic powers of the souls are defined starting from their relevant object. The locus classicus for the definitional strategy adopted in the *De anima* is *An*. I 1, 402b10-16 combined with *An*. II 4, 415a14-22. We find this exegetical approach (already adopted by Michael of Ephesus) resistible. By our lights, the reader of the *De memoria* would be required to adopt the methodology developed for the study of the soul only if the study of memory were a straightforward continuation of the investigation of the soul. But we have argued that this study is emphatically not a continuation of the *De anima*. On the contrary, the *De memoria* offers a different kind of investigation. While the *De anima* is concerned with the soul, the *De memoria* and the other essays collectively known as *Parva naturalia* are concerned with what is common to the soul and the body. As a result, there is no compelling reason to expect that the methodology adopted for the study of soul applies to the study of what is common to the soul and the body. Moreover, Aristotle's motivation for starting the study of the phenomenon of memory from the object of memory does not entail any direct or indirect reference to the *De anima*. On the contrary, Aristotle states, explicitly and unequivocally, that there is much confusion and indeed error on the topic of memory (*Mem*. 1, 409b9-10). Consequently, he recommends that the first step toward an explanation be a clarification as to the definiendum of memory.
16. King RHA, Aristotle and Plotinus on Memory. Berlin: Walter de Gruyter; 2009. pp. 20-105 (chapter 2: Aristotle) is a possible exception to the rule. Still, we are not able to find any explicit attempt to discuss the more general significance of this definitional strategy in the book.
17. For a brief introduction to this topic, see Gotthelf A, Aristotle as Scientist: A Proper Verdict. In: Gotthelf A, Teleology, First Principles, and Scientific Method in Aristotle's Biology. Oxford: Oxford University Press; 2012. pp. 394-398.
18. We refer the reader to Aristotle's explanation of the phenomenon of sleep for an especially vivid illustration of the same explanatory strategy. For a discussion of this strategy, and how it is implemented in the *De somno*, see Falcon A, Definition, Explanation, and Scientific Method in Aristotle's *De somno*. Manuscrito 2019;42(4):516-543.
19. The connection between *hypolêpsis* and *dianoia* is explicitly made in *An*. III 3, 427b14-16. For the inclusion of knowledge (*epistêmê*), belief (*doxa*), and practical intelligence

(*phronêsis*) under hypolêpsis, see *An*. III 3, 427b24-26. At the very least we can say that dianoia entails the ability to think that something is the case. Such a thinking can be true or false.

20. For a similar but not identical formulation of the *interim* definition, we refer the reader to King RHA, ref. 16, p. 27. Richard King renders *hexis* with "possession." But if Rachel Parsons is right (see next endnote), an *hexis* is not equivalent to a possession (*ktêsis*). As a matter of fact, we can possess something without using or exercising it. But this possibility is ruled out by the very idea that an *hexis* is an activity (*energeia*). In other words, *hexis* is being currently and actively in the state of having something.
21. Parsons offers a full defence of this reading in chapter 1 (especially, pages 24-38). Her critical target is Richard Sorabji and his seminal study of the *De memoria* who takes hexis to be a state, that is, a disposition (Sorabji R, Aristotle on Memory. Providence: Brown University Press; 1972. pp. 1-2). Parsons does not mention the most recent editor and translator of the *De memoria* (Bloch D, Aristotle on Memory and Recollection. Translation, Interpretation, and Reception in Western Scholasticism. Leiden and Boston: Brill; 2007.). There may be a good reason for her silence. David Bloch is not crystal clear on this interpretative point. In his introduction, Bloch suggests that when Aristotle deals with the preliminary demarcation of the phenomenon of memory, his focus is on the activity of remembering (Ibid. pp. 58-59). But if this is what he takes to be the initial definiendum, his rendering of hexis with "a state of having" is ill-chosen since it suggests a disposition rather than an activity.
22. The relevant activities are perceiving and knowing. The manuscript tradition of the *De memoria* is divided into two families with equal weight. While family α transmits energeiôn (genitive of the plural *energeiai*), family β carries the variant reading ergôn (genitive of the plural *erga*). The two most recent editors of the text (Ross D (ed.), Aristotle's *Parva naturalia*. Oxford: Oxford University Press; 1955 and Bloch D, ref. 21) prefer this second reading. David Bloch thinks that *energeiai* can be a gloss of *erga* but not vice versa. We would like to add the following reason for preferring *ergôn*: *erga* can be taken to be a way of saying that the object of memory, though in the mind, is not externally present. Of course, it is trivial that the mind cannot be active with respect of perception and memory at the same time.
23. The seminal study on phantasia remains Wedin MV, Mind and Imagination in Aristotle. New Haven and London: Yale University Press; 1988, who speaks of the "functional incompleteness" of *phantasia* (Ibid. pp. 57-62). For an introduction to the Aristotelian concept and use of *phantasia*, see Corcilius K, *Phantasia*. In: Rapp Ch, Corcilius K (eds), Aristoteles Handbuch: Leben – Werk – Wirkung. Second edition. Berlin: Metzler; 2012. pp. 346-350. On the definitional dependence of *phantasia* on perception as the reason for denying *phantasia* the status of a part of the soul, see Corcilius K, Gregoric P, ref. 4, p. 110.
24. Cf. Sorabji R, ref. 21, p. 6 and Bloch D, ref. 21, p.62.
25. For the view that thinking requires *phantasmata*, see *An*. III 7, 431a16-17 and 431b2; *An.* III 8, 432a8-10. For the claim that thinking cannot be reduced to entertaining the relevant *phantasmata*, see *An*. III 8, 432a12-14.
26. It should not be forgotten that *phantasmata* occur in all sense modalities. When we speak about "visualization" in the above text, therefore, it should be taken to stand in for all the different sensory ways in which a given content can be made to be present in the mind of a cognitive agent.

27. There is no compelling reason to transpose this claim as suggested in Ross D, ref. 22, pp. 237-238. For a fuller discussion of this claim, we refer the reader to Gregoric P, Aristotle on the Common Sense. Oxford: Oxford University Press; 2007. pp. 102-112.
28. Cf. *An*. III 1, 425a13-20.
29. The literature on and around the Aristotelian notion of *phantasmata* is enormous. On the physiology of *phantasmata*, we single Blubb C, The Physiology of *Phantasmata* in Aristotle: Between Sensation and Digestion. Apeiron 2019;52(3):273-315.
30. At this point of the argument, the cognitive soul can only be a perceptual soul. We have made this point explicit by adding the relevant qualification within angled brackets.
31. Here we find ourselves in agreement with Dorothea Frede, who argues that the phantasma is produced while perception is still in operation rather than after the operation is over (Frede D, The Cognitive Role of *Phantasia*. In: Nussbaum MC, Oksenberg A (eds), Essays on Aristotle's *De anima*. Oxford: Oxford University Press; 1992. p. 284).
32. Aristotle also employs *phantasmata* to explain the possibility of illusions, distortions of sensory experiences and other such psychological phenomena. There is no room to discuss the various applications that the concept of *phantasia* has for Aristotle here.
33. Or, indeed, as in the case of recollection, which is discussed in *Mem*. 2.
34. Once again, *hexis* is an activity. As such it is not just the possession of a phantasma. For more on this point, we refer the reader to endnote 16.