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Mapping Memory. Theories in Ancient, Medieval and Early Modern Philosophy and Medicine

This paper discusses theories of memory as developed by philosophers and medical writers from Graeco-Roman antiquity, the Middle Ages and the Early Modern period. While philosophers had much to say on the nature of memory and recollection, their epistemological role and their relationship to other functions of the soul, medical writers concentrated on the anatomy, physiology, pathology and indeed the therapeutics of memory and recollection. Yet the close relationship between philosophical and medical approaches was most clearly visible in discussions about the bodily location of memory, where theoretical concepts of the hierarchy of faculties of the soul were connected with clinical observations of memory failure as a result of injury or disease.

Body; epistemology; faculty; medicine; memory; philosophy; soul.

I Introduction: The background in classical philosophy and medicine

Among the functions of the soul identified by ancient philosophers and medical writers, memory and recollection attracted considerable attention from a very early stage. This is hardly surprising considering the oral nature of early Greek society, in which epic poems of several thousands of lines were presented orally to audiences by bards and other performers, who were believed to be capable of retaining, remembering and reproducing very large amounts of information. Throughout antiquity, Greek and Roman oratory and rhetorical theory paid great attention to the art of memory and memorizing, a set of skills deemed essential for the successful orator in the law courts, the political assembly, the rhetorical contest or the many other occasions where the spoken word was of great importance.¹

A theoretical interest in the nature and phenomenology of memory and remembering can already be found in the medical writings attributed to Hippocrates and dating to the late fifth/early fourth century BCE, where memory function and memory failure are frequently mentioned in clinical contexts among the symptoms observed in patients or among the features of specific diseases.² Moreover, in medical texts, memory and related capacities such as attention and concentration are said to be capable of being manipulated

1 See Yates 1966, chs. 1 and 2.

2 See, for example, among the case histories of patients recorded in the Hippocratic *Epidemics* I.26, case 4 (II.692 L.); III.17, case 13 (III.140 L.); III.6 (III.82 L.); and VII.3 (V.370 L.), on the son of Eratolaus: “Loss of memory of this sort: he would ask something he wanted to know, subside awhile and ask it again, and repeat it as though he had not spoken. He would forget that he was sitting at stool unless someone were to remind him of it. He himself noted the ailment. He was not unaware?” (We are grateful to Chiara Thumiger for these references).

and enhanced by certain kinds of regimen and life-style.³ In philosophical authors, such as Plato and Aristotle, memory is discussed in epistemological contexts as a source of information and a means of human cognition, or in psycho-physical discussions of the capacities of the soul. In connection with these cases we perceive a concern with questions about the nature and mechanism of memory and remembering. What is memory, what are its objects? How does it work and how is it related to other capacities of the soul, such as sensation, thought, imagination and dreaming? Is there a difference between memory and recollection? Are they specifically human capacities or do animals also share them? What determines the quality of someone's capacities for memory and recollection, and how can one enhance their performance? And how is memory related to the body? Is it located somewhere in particular, and is it susceptible to bodily influences?

Plato gave memory a special place in his well-known account of learning as a kind of remembering (*anamnêsis*), a retrieval of information stored deep down in every individual soul and capable of being recovered by a targeted question-and-answer procedure. This is demonstrated by Socrates in the dialogue *Meno*, where he subjects an uneducated slave boy to a cross examination, thus enabling him to produce and “recollect”, apparently by his own effort, the proof of the Pythagorean theorem.⁴ Likewise influential was Plato's comparison of memorizing to the reception of imprints in a wax tablet.⁵ But the most systematic philosophical account of memory is to be found in Aristotle's short work on memory and recollection (*De memoria et reminiscencia*), preserved among the *Parva naturalia*, a series of short treatises following on the *De Anima* and devoted to various mental capacities and their bodily aspects, such as sensation, sleep and dreams, locomotion, respiration, growth and nutrition.⁶ In this treatise, Aristotle discusses the place of memory within the hierarchy of capacities of the soul, the objects of memory and the distinction between memory and recollection. He locates memory in the sensitive part of the soul, and associates it closely with two central operations of the sensitive faculty, i.e. imagination and the so-called common sense, the former because it consists of a kind of mental viewing (seeing something as an image of something else, 450b25–451a8), the latter because it involves a kind of meta-sensation and an awareness of time difference (449b30–450a25). Interestingly, Aristotle distinguishes between memory (*mnêmê*) and recollection (*anamnêsis*): the former is a faculty that not only humans but also a number of animals possess and which consists in the retention, storage and (largely passive) retrieval of sensations in response to certain stimuli. By contrast, recollection is a capacity confined to humans, as it is a kind of deliberative search (*zêtêsis*) for information that one knows one has acquired before, a kind of reasoning (*sylogismos*) based on certain premises and leading to a conclusion (449b6, 453a4–9).⁷ In this connection, Aristotle also discusses mnemonic systems and techniques, such as the famous system of “places” (*topoi*) or *loci communes* (452a13), a system further developed in Roman times and described by Cicero, by the (anonymous) author of the treatise *To Herennius* and by Quintilian in his handbook on oratory, and then subsequently in medieval mnemonic theorists. Furthermore, Aristotle on two occasions dwells on the bodily aspects of memory and recollection (450a32–b11;

3 See the late fifth/early fourth century BCE medical work *On Regimen (Peri diaitês, De victu)*, ch. 35, where a number of mental faculties such as thought, sensation, concentration and memory are presented as being capable of being enhanced or damaged depending on the regimen adopted (food, drinks, exercise, hygiene, etc.), and where the author recommends specific dietary measures to enhance memory function; see especially p. 152,6, 152,11 and 154,23 in the edition by Hippocrate 1984; see also the discussion by Van der Eijk 2011.

4 Plato, *Meno* 82b9–84b1.

5 *Theaetetus* 191c8–e1. For Plato's thoughts on memory see also *Philebus* 34a2–c2, 39a1–d4.

6 For discussions of this work see Sorabji 1972; King 2004; Bloch 2007.

7 On these aspects of Aristotle's theory of memory and their reception in early modern debates see *infra*, § 5.

453a15–b7), and it is here that we see a kind of physiology and pathology of memory: he observes that some people have very good memories but may be slow in remembering, whereas the reverse is also found; and he discusses a number of cases of memory failure (451a8–12; 453b23–31). Among the determining factors of these differences in aptitude and performance, he mentions anatomical and physiological variables such as the shape and proportions of the body, youth and old age, as well as the quality of what he calls “surfaces” within the body (an echo of the wax tablet imagery in Plato’s *Theaetetus*). Towards the end of the treatise, Aristotle argues that although recollection is an intellectual activity, it is nevertheless also a bodily process, as is shown by the fact that certain people with a particular physiological constitution have trouble remembering (453a14). In this connection, Aristotle comments on the localization of recollection by referring to the presence of moisture around “the perceptual region” (*aisthêtikos topos*) as the cause of the disturbance (453a24). Aristotle does not indicate which parts of the body he has in mind, though presumably he is referring to internal bodily parts in the region of the heart, for Aristotle was a cardiocentrist, who located the central sense faculties in the region of the heart. It is at any rate clear that according to Aristotle (possibly criticizing Plato, *Philebus* 34b6–7), memory and recollection have a physical basis, and this invited medical inquiries into their anatomical, physiological and pathological aspects and into the extent to which they admitted of treatment or even enhancement by means of medical measures.

No theoretical discussions of memory survive from Hellenistic philosophy or medicine, although, as was mentioned before, we can see glimpses of Stoic and Epicurean ideas on memory in Cicero’s rhetorical works (e.g., in *De oratore* II.87–88) and in the treatise *To Herennius* (3.16–24). Yet an important development in Hellenistic medicine should not remain unmentioned: the discovery, by the Alexandrian anatomists Herophilus and Erasistratus (late fourth/early third century BCE), of the nervous system, of the central role of the brain in cognition and locomotion and the observation, by Herophilus, of the various ventricles within the brain.⁸ The connection of these discoveries with the philosophical debate about the location of what Stoic philosophers referred to as “the ruling part of the soul” received its most prominent and impressive articulation by Galen in the second century CE.

2 Galen on memory and the brain

Unlike Aristotle, Galen did not write a systematic treatise on memory, but we do find in his oeuvre several passages where he writes about memory in considerable detail. In these passages, Galen’s approach appears to be strictly medical, and his goal is not a philosophical understanding of the nature of memory, but rather the therapeutics of memory failure, cognitive failure or, more broadly, of the conditions of which memory failure is a symptom. Yet, even though Galen does not analyze the nature of memory and does not spend time differentiating between memory and recollection – although he uses both concepts – he recognizes memory as an important faculty for a flourishing human life: for instance, if one wants to be a good doctor one needs to have a good memory, love to work hard and has to possess a shrewd mind;⁹ without a good memory, one would not be able to recall past experiences appropriately. He also thinks memory plays a central role in reasoning and knowing, as well as in the process of formation and recognition of concepts.¹⁰ When memory fails, we may find ourselves in trouble: we might not be able, for instance, to follow a process of reasoning and draw the correct

8 See von Staden 1987, 247–248, 314–316.

9 Galen, *On the Order of my Own Books* IV.3 (ed. V. Boudon-Millot, Paris 2007).

10 Galen, *On the Therapeutic Method* X.134.13–15 K., where Galen mentions that donkeys, too, have memory.

conclusions; or, we may not recognize our relatives, or even ourselves.¹¹ He also discusses the importance of memory for developing and maintaining practical skills, since we can lose the ability to perform activities in which we were experts. Thus, what we have from Galen are considerations of memory across many different works, some more theoretical than others, but almost always in the context of the *medicine* of memory.

2.1 Localization of memory

One of the debates in Galen's time was where to locate the *hégemonikon*, the ruling center of the soul, which includes the cognitive faculties, within the human body.¹² The debate was centered on two main positions, encephalocentrism or cardiocentrism. Memory is an important element in this story, as it is one of the central cognitive faculties along with reason and imagination. Galen supported the encephalocentric view, *i.a.* by means of extensive dissection of animal bodies (including vivisection), and attempted to defend his position in many of his works.¹³ Thus in *On the Doctrines of Hippocrates and Plato*¹⁴ Galen argues that humans are governed by three different “principles” or “starting points” (*archai*), located in three different parts of the body, one in the head, the other in the heart and a third in the liver. The work of the *arché* located in the head is to provide imagination (φαντασία), memory (μνήμη) and recollection (ἀνάμνησις), knowledge (ἐπιστήμη), thought (νόησις) and ratiocination (διανόησις). We find Galen also arguing in favor of this position in *On the Affected Parts*, where he says that

To us, as adherents of the evidence from the anatomy, it seems reasonable that the soul is itself located in the body of the brain, from where reasoning comes into existence, and where the memory of the perceptible impressions lies.¹⁵

This connection of anatomical research and theoretical reasoning is characteristic of Galen's way of thinking. We find, for instance, in *On the Doctrines of Hippocrates and Plato* VIII Galen arguing by logical reasoning in favor of the localization of *hégemonikon* in the brain.¹⁶ As the *hégemonikon* is in the brain, and memory is ‘part’ of the *hégemonikon*, therefore memory is in the brain too. Moreover, as memory is a faculty that has as its main function the preservation of impressions, Galen believes, much in tune with the wax-tablet metaphor,¹⁷ that the substance to which memory belongs must be soft in order to receive those very impressions and keep them stored correctly:

The substance (of the brain) is similar to the nerves, of which it was meant to be the source, except that it is softer, and this was fitting for a part that was to receive all sensations, produce impressions and understand thoughts.¹⁸

But how are memories formed?

11 Galen, *On the Causes of Symptoms* VII.200.19–201.4 K.

12 On the historical development of the concept of *hégemonikon*, see Rocca 2003, ch. 1.

13 See Tieleman 1996.

14 *PHP* 438.28–34 (De Lacy).

15 *De Loc. Aff.* VIII.174.16–175.7 K.: τοῖς γὰρ ἐκ τῆς ἀνατομῆς φαινομένοις ἀκολουθοῦσιν ἡμῖν εὐλογον ἐφαίνετο, τὴν μὲν ψυχὴν αὐτὴν ἐν τῷ σώματι τοῦ ἐγκεφάλου κατωκῆσθαι, καθ’ ὃ καὶ τὸ λογίζεσθαι γίγνεται, καὶ ἡ τῶν αἰσθητικῶν φαντασιῶν ἀπόκειται μνήμη. Another passage where Galen mentions memory as belonging to the rational part of the soul is *That the Faculties of the Soul follow the Mixtures of the Body* II.1–9 Bazou / IV 771–772 K.

16 *PHP* VIII 1.3–5 (De Lacy).

17 See Carruthers 2008, mainly ch. 1, *Models of Memory*, pp. 18–56, where the author summarizes both the wax-tablet and the *thesaurus*, ‘storage-room’ models.

18 Galen, *On the Usefulness of the Parts* I.461.4–6 Helmreich.: οὗτος οὖν τὴν μὲν οὐσίαν ὁμοιότατός ἐστι

2.2 The formation of memories

According to Galen, memories are dependent on perception (αἴσθησις) and made of impressions (φαντασίαι).¹⁹ These impressions leave traces (τύποι) in the individual's memory of the objects and situations with which they are in contact in everyday life. For this process of encoding to be done correctly three conditions must be fulfilled: (i) the impression must be clear; (ii) individuals must pay attention to what is going on in their field of perception; and (iii) the individual's physiological make-up must be in an appropriate condition.

Thus, for instance, if an impression reaches the sense organs but these are not working properly, the impression might not pass the threshold of primary sensation, and therefore there is no transmission of information to a deeper level of storage. As an example, Galen mentions people under strong emotional states (fear and anxiety), drunkenness or during sleep, as being unable to grasp the impressions correctly because, as their souls are working dimly, they are not paying attention with the entire mind (μὴ προσεκτικῶς παντὶ τῷ νοῷ) to what is happening, and therefore the impressions are dim too. Consequently, the impressions will not remain stable in memory. We might infer from this that both the physiological and psychological make-up are two sides of the same coin, which we cannot split when studying Galen's conception of memory.

However, Galen goes further, claiming that if "one grasps traces of the things in the impressions clearly, one preserves them forever, and this is remembering"²⁰, yet if the opposite is the case, the impressions are fated to fade away, and this is forgetting.

It seems that an innovative approach to memory pioneered by Galen is the role of the psychological attitude of *attentiveness* (*prosektikos*) for the correct process of transition of impressions into memories, and for the possibility that they might be recalled at a later stage in an appropriate way.²¹ Yet both the bodily and psychological conditions might turn into pathologies with different levels of severity.

2.3 Pathologies of memory

The main part of the text where we find Galen writing about the pathologies of memory is in Book III of *On the Affected Parts*, where he deals with a clinical case of loss of memory.

Among the psychological pathologies affecting memory – as a result of *dyskrasiai* of the organism or of some of its parts – we find *môrôsis*, *lêthê*, *lêthargos*, *epilêpsia*, and also episodes of delirium (παρανοία).²² These pathologies might be either transitory or chronic, affecting reasoning and/or memory, or only some particular functions depending

τοῖς νεύροις, ὧν ἔμελλεν ἀρχὴ γενήσεσθαι, πλὴν ὅσω μαλακώτερος αὐτῶν ὑπάρχει. καὶ γὰρ καὶ τοῦτ' ἔπρεπε τῷ πάσας μὲν εἰς αὐτὸν τὰς αἰσθήσεις ἐκδεξομένῳ, πάσας δὲ φαντασίας φαντασιωθησομένῳ καὶ πάσας νοήσεις νοήσουσι. In *UP* I.64I.11–19 Helmreich. Galen mentions again that the faculties of memory (μεμνημένον), imagination (φαντασιούμενον) and reasoning (λογιζόμενον) are located in the *bégemonikon*.

19 For memory as dependent on perception (αἴσθησις), see Galen, *On the Elements according to Hippocrates* 76,13 (De Lacy). The section where Galen develops his view on the formation of memories in greater detail is chs. 5 and 6 of Book II of *On the Movement of the Muscles* (*De Motu Muscularum*) 33.12–37.15 Rosa = IV.440.5–450.15 K. We find brief remarks regarding memory on Galen's oeuvre in Pigeaud 1988, 159–170, and also in Siegel 1973, 147–149.

20 *Mot. Musc.* 35.9–11 Rosa = IV.445.4–5 K. ἂν μὲν οὖν ἐναργεῖς τοὺς τύπους τῶν πραγμάτων ἐν ταῖς φαντασίαις λάβῃ, διασώζει μέχρι παντός, καὶ τοῦτο μὲν τὸ μνημονεύειν ἐστίν.

21 *Mot. Musc.* 35.7–11 Rosa = IV.445.1–6 K.

22 The main source is *De Loc. Aff.*, Book III, VIII 147–168 K, but we also find important remarks in *De Symp. Caus.* VII.200–202 K.

on memory, such as the ability to perform certain skills (for instance reading, and some unspecified *technai*), or even recognition.²³

What is relevant for Galen's explanation of memory's dysfunctioning is that the brain suffers an intense loss of temperature, which we find happening in some mental disorders, such as *epilēpsia* and *môrōsis*, but also in old age.²⁴ This cooling might be a primary affection of the brain or a co-affection, where the cause of its temperature loss is located elsewhere in the organism, but it might also lead to lower levels of psychic and natural capacities. For instance, as one grows older the organism becomes colder and drier, which might cause increasing difficulty in retaining new information, producing new memories and recalling old ones.²⁵ Therefore, the quality of the brain's substance is a crucial condition for the functioning of memory.

3 Late antiquity and the location of memory in the posterior ventricle of the brain

For all Galen's clinical observations about memory, its physiology and pathology, he did not locate memory anywhere specific within the human brain; and although he was well aware of the brain's main structures, the ventricles and the membranes, based on careful examination and dissection of animals whose brain was closest in size and structure to that of humans, he did not specify the place within the brain where cognitive faculties were located. Indeed, in one passage he even positively speaks against the tendency of other physicians to differentiate the cognitive faculties according to different parts of the brain.²⁶

It is only towards the end of the fourth century that we encounter the first extant attempt at localization of memory within the posterior ventricle of the brain.²⁷ The theory is first attested in the treatise *On the Nature of Man* by Nemesius of Emesa. This work is, essentially, a philosophical anthropology: it discusses human nature and its position within the natural world and the cosmos at large.²⁸ Although Christian in background and orientation, the work draws heavily on Greek philosophy and medicine, and Aristotle, Plato, Hippocrates and Galen are frequently mentioned. Nemesius adopts the teleological view of the nature of human beings found in Plato's *Timaeus* and Aristotle's *Parts of Animals*, but he enriches it by also incorporating Galen's teleological account of the parts of the human body in *On the Usefulness of the Parts*. Nemesius shows with a remarkable amount of detail how the design of the body is present even in the minutest detail of bodily functions such as nutrition, digestion, respiration and the pulse.

23 *De Sympt. Caus.* VII.200.15–201.3 K.: ὧπται γὰρ οὐκ ὀλιγάκις ὡς εἰς ἀπόστασιν τινα κατασκήψαντα νοσήματα μώρωσιν ἢ λήθην ἐπήγαγεν. ἐνίους γοῦν καὶ γράμματα καὶ τέχνας τελέως ἐπιλαθομένους ἔθεασάμεθα καὶ μηδὲ τῶν σφετέρων ὀνομάτων μεμνημένου.

24 *De Loc. Aff.* VIII.165.12–13 K.: ἐπὶ γοῦν τῆς ἀπολωλυίας ἢ μεγάλως βεβλαμμέκης μνήμης ψυχρὰ μὲν δυσκρασία πάντος ἐστὶ. For epilepsy and *môrōsis*, see *De Loc. Aff.* VIII. 173.5–201.16 K. and 160.8–165 K., respectively. For cooling as a result of ageing, see *De sanitate tuenda* VI.357.3 K. ff.: ὃ γε κυρίως ἅπαντες ἄνθρωποι γῆρας ὀνομάζουσιν, ἢ ξηρὰ καὶ ψυχρὰ κράσις τοῦ σώματος ἐκ πολυετίας γινομένη, and also for forgetting as a result of advanced age *De Sympt. Caus.* VII 201.4–5K.

25 Galen, *On the Therapeutic Method* X.456–457 K., quotes Plato's *Phaedrus* 276d3, claiming writing as an antidote against the tendency to forget that is a consequence of growing old: γυμνάζων ἑμαυτὸν, εἰς τε τὰ παρόντα χρησιμώτατον γυμνάσιον εἰς τε τὸ τῆς λήθης γῆρας, ὡς ὁ Πλάτων φησὶν, ὑπομνήματα θησαυρισόμενος. This might be a rhetorical stance, but seems to show that ageing and forgetting are correlated.

26 Galen, *On Affected Parts* III.9 (VIII.174–175 K.).

27 See Grunert 2002.

28 See Sharples and Eijk 2008.

It is in this connection of functional anatomy that Nemesius discusses various functions of the soul, and that he comes to speak of the relationship between sensation or imagination (*to phantastikon*), thought and memory. He systematically assigns each psychic function to a specific part of the body, which he designates as its “instrument” (*organon*); in the case of memory (ch. 13) he assigns it to the “posterior cavity of the brain”, a claim for which he offers empirical justification:

Thus the faculty of imagination hands on things imagined to the faculty of thought, while thought or reasoning, when it has received and judged them, passes them on to the faculty of memory. The organ of memory, too, is the posterior cavity of the brain, which they call the cerebellum and the enkranis, and the psychic pneuma within it. Since we say that the frontal cavities of the brain are the origin and roots of sensation, that of thought the central cavity and the posterior of memory, it is necessary to demonstrate whether this is the state of affairs, lest we should seem to believe what is being said without having a good reason for it. The most adequate demonstration is gained from the activity of the parts. If the frontal cavities are damaged in any way, the senses are impaired but thought remains unharmed. If the central cavity alone suffers, thought is overthrown but the sense-organs continue to preserve their natural [power of] sensation. If both the frontal and the central cavities suffer, reason is damaged together with the senses. But if the cerebellum suffers, memory alone is lost together with it without sensation and thought being harmed in any way. But if the posterior suffers together with the frontal and central ones, sense, reason and memory also are destroyed, in addition to the whole creature being in danger of perishing. This becomes clear from many affections and symptoms, particularly from phrenitis. For the senses of some of those with phrenitis are preserved and thought alone is harmed.²⁹

The theory set out here distinguishes memory as one of the three key cognitive functions of the brain alongside thought and imagination (*to phantastikon*, which also includes sensation), and as such it builds on Galen’s system of soul functions. Yet it goes beyond Galen in mapping each of these three functions onto a different part (“cavity”) of the brain: imagination in the anterior, thought in the central and memory in the posterior cavity of the brain. Each of these localizations is supported with empirical evidence of cognitive dysfunctioning as a result of trauma or disease, such as phrenitis (an acute form of mental derangement). How this theory was arrived at and by whom, we do not know, though the empirical evidence mentioned suggests a medical origin. Indeed, a very similar theory is found in the early Byzantine medical encyclopaedia by Aetius of Amida, in the chapter on phrenitis, and attributed to the Pneumatist physician Posidonius of Byzantium, who was probably a younger contemporary of Nemesius:

Phrenitis is an inflammation of the membranes surrounding the brain during acute fever, causing insanity and loss of reason ... There are several different kinds of phrenitis, but the following three are most important. Either only imagination is affected and reasoning and memory are spared; or only reasoning is affected and imagination and memory are spared; or imagination and reasoning are affected and memory is spared. Furthermore, loss of memory due to febrile diseases usually destroys the faculties of reason and imagination as well. A disorder of the anterior part of the brain affects only the imagination; a disorder of the middle ventricle leads to aberration of reason; a disorder of the posterior part of the brain near the occiput destroys the faculty of memory, usually together with the other two.³⁰

29 Nemesius, ch. 13, p. 69, 16–70, 13 (ed. Morani, Leipzig 1987).

30 Posidonius as quoted by Aetius of Amida, Medical Books VI.2 (ed. Olivieri, vol. 2, 125).

The theory of ventricular localization of cognitive functions is, in a way, an ancient precursor of contemporary attempts in neuroscience to locate specific functions in specific sections of the brain, and to make these attempts plausible by means of brain scans and other methods of neuro-imaging. Regardless of its factual (in)accuracy,³¹ it was very influential and set the tone for many centuries, in which the theory was further developed and refined, with sub-distinctions being introduced within the rational and memorative part of the soul. Obviously, the idea of localizing cognitive functions in different sections,³² or even in the different halves of the brain,³³ was attractive to philosophers and medical writers of late antiquity and the early medieval period, such as Avicenna, who used this and other medical evidence to ‘update’ Aristotle’s obsolete cardiocentrism.

4 Medieval debates: Thomas Aquinas and William of Ockham

Like their ancient predecessors, medieval philosophers were fully aware that an analysis of memory must not be missing in a comprehensive theory of the soul, for one cannot give a satisfactory explanation of the soul unless one pays close attention to all of its functions. Memory is a crucial function, as Aristotle famously pointed out at the beginning of his *Metaphysics*. Human beings cannot acquire knowledge, he wrote, unless they have experience; and they cannot have experience unless they have memory, “for many memories of the same thing produce finally the capacity for a single experience.”³⁴ Thus, it is my detailed memory of a given plant that enables me to compare the plant I actually see with the plant I saw in the past, to detect similarities, and to realize that they belong to the same species. I thereby acquire an experience and eventually knowledge of that species – knowledge I would not have without memory. But what exactly is memory about? To what extent is it a reliable source of knowledge? And which capacity or faculty of the soul makes it possible?

Medieval philosophers examined these questions in great detail. Inspired by Aristotle, they were particularly interested in the capacity that is responsible for memory.³⁵ Thomas

31 For a discussion of Nemesius’ theory from a contemporary perspective see Van der Eijk 2008. As far as memory is concerned, the suggested location ‘in the posterior ventricle’ or ‘in the cerebellum’ could make sense in relation to the temporal horn of the lateral ventricle, which is next to the hippocampus, the seat of short-term memory formation. From a modern point of view, however, damage to the cerebellum may result chiefly in disorders affecting movement and balance but not in memory loss; and damage to the brain tissue near the occiput may result in loss of vision rather than memory.

32 Thus the Alexandrian commentator John Philoponus, in his *Commentary on Aristotle On the Soul* (p. 155.20–30 Hayduck), refers to a similar theory: “It is also evident that from the affections of the body something proceeds to the soul, too. For when the one suffers, the other suffers, too, and when the one is in good mood, the other cheers with it. Also the fact that the body, when it is in this or that condition, hinders the soul or does not hinder it, is known to everybody, whereas this hindering of the soul through the body would not happen if not some sort of sympathetic reaction proceeded from the soul’s relationship with the body to the soul in this way, just as memory is affected when a particular cavity at the back of the brain is affected, as is the rational part of the soul when some other cavity is affected, and when it is in a certain state the soul is easily affected by imagination, but when it is in a different state, it is very difficult for it to imagine.”

33 As testified by the source Anonymous of Brussels, the author of a late antique Latin treatise on human nature, who locates sensation in the right hemisphere: “The brain derives its power of sensation and thinking from the blood and the natural heat. It contains one part with which it understands, one part with which it perceives. Thus there are two brains in the head, one which provides understanding, the other sensation. The right part is the one with which one perceives, the left is the source of understanding” (ed. M. Wellmann, *Die Fragmente der sikelischen Ärzte Akron, Philistion und des Diokles von Karystos*, Berlin 1901, 234). See the discussion by Lokhorst 1996 and Harrington 1987.

34 *Met.* I.1 (980b29–981a1), trans. W.D. Ross in: *The Complete Works of Aristotle*, Princeton 1984, 1552.

35 Of course, it was not only Aristotle but also a number of commentators of late antiquity (among them Themistius and Alexander of Aphrodisias) and Avicenna who sparked their interest in capacities and faculties. For a brief survey, see Hasse 2010.

Aquinas (ca. 1225–1274) is a telling example. He explicitly asks if memory is to be ascribed to the sensory or the intellectual capacity of the soul, thereby attempting to localize it.³⁶ Yet why does it matter where memory is situated? We can find an answer to this question if we look at Aquinas' general account of cognition. According to his empiricist program, cognition always starts with sense perception: we perceive sensible properties of things around us and form sensory images (so-called “phantasms”) of them.³⁷ It is clear that it is the sensory capacity, present in bodily organs, that is responsible for this process. And it is equally clear that brute animals as well as human beings can form sensory images because they are all endowed with sensory capacities. However, unlike animals, human beings have an additional intellectual capacity that enables them to create abstract concepts and to form judgments about external entities. Thus, when I see a tulip in the garden I am not only able to form an image that presents this plant with its specific color and shape, I can also create a concept that indicates its universal features, and I can produce a judgment like ‘Tulips have leaves’ or ‘Tulips bloom in spring’. A dog standing next to me and looking at the tulip is utterly incapable of doing that – it cannot go beyond the sensory level. It is therefore of crucial importance to refer to two capacities in human beings: their sensory capacity enables them to have access to *particular* things, whereas their intellectual capacity makes it possible for them to grasp *universal* features.

Given this background theory, it is not surprising that Aquinas asks about the capacities that are required for memory. The thrust of this question can easily be illustrated. Suppose that I am now remembering the tulip I saw yesterday in my garden. Do I simply remember a particular thing so that I need nothing but a sensory capacity? Or do I also remember universal features so that I need an additional intellectual capacity? Aquinas examines this problem with great care. He first points out that the sensory capacity is indispensable. In fact, he mentions memory as one of the four inner senses, along with common sense, imagination and the estimative power.³⁸ Its function and cooperation with the other three senses can again be illustrated with the tulip example. Once I have seen and smelled this flower with my external senses, I can collect all the sensible properties thanks to the common sense. The imagination then produces a phantasm that presents the tulip as a special thing with particular features, and the estimative faculty evaluates it as something pleasant and enjoyable. All these activities stimulate memory, the fourth inner sense, which stores what has been produced by the other senses. That is, it retains the image of a particular thing that is taken to be pleasant and enjoyable. Aquinas calls it “the store-house” (*thesaurus*), which has a purely passive function: it does not add any element to the sensory image, nor does it transform or manipulate it – it simply stores it the way it is.

It is clear that this inner sense is located in the body and that it therefore depends on a bodily organ for its functioning. Aquinas does not explain where exactly it is located, nor does he enter into physiological details about the way it functions, but he does make clear that it cannot work properly unless it is present in a healthy, well-grown body. He even gives two examples in order to illustrate how memory can be impeded if the body is imperfect.³⁹ New-born children have worse memory than adult people, he claims, because their head is not yet well disposed; and very old persons also have worse memory because their head is no longer well disposed. Vague and general as these remarks are, they show that Aquinas is fully aware of a correlation between memory and its bodily implementation: the worse the relevant bodily organ is disposed, the worse memory as an internal sense will function.

36 *Summa theologiae* I, q. 79, art. 6, ed. P. Caramello, Rome/Turin 1952, 386–388.

37 *Summa theologiae* I, q. 84, art. 1; for a concise analysis, see Pasnau 2002, 171–199.

38 *Summa theologiae* I, q. 78, art. 4.

39 *De memoria et reminiscencia*, cap. 8, ed. Leonina XLV/2, Rome/Paris 1985, 132b.

If human beings had nothing but this inner sense, they would be exactly like animals that store images and reactivate them later. It is obvious, however, that human beings can do more than deal with images. When I remember the tulip I saw yesterday, I am not only able to reactivate an image that presents an object with green leaves and red petals, I can also realize that it was a tulip. That is, I can categorize the thing I saw as an object of a certain type. To do that, I clearly need the concept ‘tulip’, a concept that enables me to distinguish the flower I saw from other objects. And I cannot come up with this concept unless I use my intellectual faculty. Memory in human beings is therefore not a purely sensory affair. It involves sensory *and* intellectual activities and hence requires two types of capacities or parts of the soul. Aquinas is very clear about this point:

So consequently, if memory is taken only as the power of preserving species [i.e. concepts], then one must say that memory is in the intellective part. On the other hand, if the nature of memory is that its object be past, as past, then memory will not be in the intellective part, but only in the sensory part, the part that apprehends particulars.⁴⁰

Human memory is obviously sensory insofar as it is about particular objects, and intellectual insofar as it includes a conceptualization of these objects. This is the main reason why it differs crucially from the memory to be found in animals. Aquinas uses two different terms in order to distinguish the two types of memory: human beings have *reminiscentia*, while animals only have *recordatio*.⁴¹ To be sure, this does not exclude the possibility for human beings to have mere *recordatio* in some situations. Suppose that you walk through a garden and quickly look at the flowers around you without thinking what kind of flowers you are seeing. You simply register a number of red and green objects. If you then remember them later, you will only be able to reactivate images with red and green patches; your memory will not differ from that of a dog. Yet in many situations you realize that you see flowers of a certain type; consequently you will remember them as tulips. In a nutshell, the use of your intellectual faculty enables you to have *reminiscentia* and not simply *recordatio*. Aquinas even claims that conceptual memory enables human beings to go through chains of reasoning.⁴² Thus, you cannot only remember the entity with green leaves and red petals as a tulip, you can also reason ‘It was a tulip and therefore a plant’ or ‘It was a plant and therefore a living thing that grows and dies.’ This is possible because the concept ‘tulip’ is intimately connected with other concepts, and whenever you activate a single concept you relate it to many other ones. To put it in modern terms, one could say that you activate a large conceptual space and make moves in that space. This is something no non-rational animal is capable of doing.

The fact that memory requires both sensory and intellectual capacities has an important consequence: only a fully-fledged human being can have true memory. Neither a purely material being that is deprived of intellect nor an immaterial being that lacks the senses is capable of remembering things as particulars belonging to a certain type of things. This consequence poses a problem for all medieval authors, among them Aquinas, who subscribe to the thesis that the human soul will be separated from the body after death. Does this mean that the separated soul, which is completely immaterial, will no longer have true memory because it will lack a body and hence well-functioning inner senses? Being aware of this awkward consequence, Aquinas tries to avoid it. He claims that “once it has been separated from its body, the appropriate mode of understanding of the soul is to turn toward intelligible things straightaway – just as is appropriate for

40 *Summa theologiae* I, q. 79, art. 6, trans. R. Pasnau in: *The Treatise on Human Nature*, Indianapolis 2002, 91.

41 *Summa theologiae* I, q. 78, art. 4, corp.

42 *Summa theologiae* I, q. 78, art. 4, corp.

other separate substances.”⁴³ Thus, when my soul is separated from my body, it will no longer turn toward a phantasm that presents the color and the size of the tulip I saw. It will simply grasp a number of concepts, which are immaterial items that exist in the intellect, and it will remember the tulip as something falling under these concepts. The problem is, however, that concepts are always universal. No matter how many concepts I have, they will never relate me to a particular tulip. Even if I use a large bundle of concepts, say ‘tulip-flower-blooming-red’, I will not remember the unique rose in my garden. I will instead be cognitively related to any item that falls under this bundle. Aquinas seems to be aware of this problem. He states that a separated soul has cognitive access to a particular thing, but then hastens to add: “not one that is certain and determinate, but one that is general and confused.”⁴⁴ But what is the value of general and confused memory? Do I really remember a tulip or, more importantly, individual persons if I do not remember them as distinct individuals, but only as human beings falling under certain concepts?

William of Ockham (ca. 1286–1349) saw this problem clearly and was therefore dissatisfied with Aquinas’ solution.⁴⁵ He insisted that a satisfactory theory of memory should be able to explain how a human soul – even a soul separated from the body – can have determinate memory of particular things. That is why he devoted a long discussion to the memory of separated souls. Once we understand how determinate memory is possible in this special case, he assumed, we can also explain how it is possible in life before death, since the basic structure of the soul is the same before and after death.⁴⁶

How then is memory to be explained according to Ockham? We cannot answer this question unless we take a short look at his general theory of cognition.⁴⁷ Like Aquinas, Ockham claims that cognition always starts with sense perception. Yet unlike Aquinas, he denies that there are any universal features that can be detected by means of the intellect. He defends the thesis that both sensory and intellectual capacities make particular things with particular features cognitively accessible. In his view, there is a two-step process: the senses that are acted upon by external things first provide sensory cognition of particulars, which consists in sensory images; the intellect then forms mental terms and sentences and thereby produces intellectual cognition.⁴⁸ The important point is that the first mental sentences are always about particular things. Thus, when I see the tulip I form the sentence ‘There is a red tulip in front of me’ – a sentence about a particular tulip, not about tulips in general.

Now the crucial question is: how can I remember that particular tulip? It is at this point that Ockham parts ways with Aquinas. He rejects the view that I need a sensory image. All that is required is a habit, i.e. an acquired disposition, in the soul.⁴⁹ And this habit remains in the soul even after it has been separated from the body. Thus, even when I no longer have an image that presents something red and green, I have a purely intellectual disposition to reactivate the earlier intellectual cognition. But how can I reactivate it? Ockham’s answer is clear: I need to produce a higher-order cognition that has the earlier

43 *Summa theologiae* I, q. 89, art. 1, corp.; trans. R. Pasnau, 205–206.

44 *Summa theologiae* I, q. 89, art. 3, corp.; trans. R. Pasnau, 210. See also *Quaestio disputata de anima*, art. 20, corp., in *Quaestiones disputatae*, ed. P. Bazzi et al., Turin / Rome 1949, 356–357.

45 He explicitly discusses and rejects it in *Reportatio* IV, q. 14 (OTh VII, 290–292). All references to Ockham’s works apply to his *Opera Theologica* (= OTh) and *Opera Philosophica* (= OPh), St. Bonaventure 1967–1988.

46 Ockham justifies this claim by arguing that the intellectual part of the soul is a really distinct substantial form that has the same functions before and after death. On his metaphysics of the soul, see Perler 2010.

47 He presents the core of his theory in *Ordinatio*, prol., q. 1 (OTh I, 16–47). For a detailed analysis, see McCord Adams 1987 and Perler 2002.

48 All the mental sentences form together a mental language, as Ockham unhesitatingly affirms in *Summa Logicae* I.1–4 (OPh I, 7–16). On this crucial assumption, see Lenz 2003.

49 *Reportatio* IV, q. 14 (OTh VII, 293–294).

intellectual cognition as its object.⁵⁰ Thus, I need to come up with a type of intellectual cognition like ‘I think that there was a red tulip in front of me.’ Strictly speaking, this cognition has two objects, as Ockham points out, namely the earlier cognition and the fact that it occurred in the past. That is why I think that there *was* a red tulip in front of me; I am not simply replicating the earlier cognition.

The important point about this explanation is that even the separated soul can remember a particular object because it has a habit that brings back, as it were, the earlier cognition. As the reference to the particular object was already fixed in this earlier cognition, no sensory image is necessary. Nor is an external stimulus required. In Ockham’s view, the soul is an autonomous agent that can activate a habit on its own. This can again be illustrated. Suppose that I saw the tulip yesterday and that I acquired a habit of reactivating this cognition. How can I make use of this habit now? I do not need to encounter the tulip again, nor do I need another person or some object that triggers my habit. I can trigger it myself, viz. by wanting to remember what I saw yesterday. Of course, there are limits to what I can remember. Only a habit that is fresh and strong can be triggered. If I had seen the tulip more than a year ago, I would hardly have the right kind of habit. Habits come in degrees and can become weaker after some time. That is why I cannot remember everything I once experienced. However, if I have a strong habit, then I can – and in fact often do – remember things simply by wanting to bring back an earlier cognition.

Quite obviously, Ockham endorses the view that memory is a purely intellectual affair. The fact that the earlier cognition was based on some sensory experience does not necessitate a sensory activity at the moment in which this earlier cognition is restored. All that is required is the triggering of an intellectual habit. But what exactly do we remember when the habit is triggered? In his answer to this question Ockham is again in disagreement with Aquinas. According to Aquinas, we remember things (mostly material objects) which we encountered in the past. By contrast, Ockham holds that we remember our own earlier cognition of these things. He emphasizes that “an act of remembering is primarily about objects like ‘I saw,’ ‘I heard,’ ‘I understood.’”⁵¹ Thus, strictly speaking I do not remember the tulip, but my earlier *seeing* of the tulip. This means, of course, that memory is always about mental items, not about material things. And it is thoroughly subjective: we do not remember things as they really were, instead we remember our own cognitive access to them. Since every person has their own access, every person has a different object of memory.

At first sight, this thesis looks quite puzzling. Is it really the case that there is no common object of memory for different persons? Shouldn’t we rather say that many persons who saw the same tulip remember the same object? Admittedly, they may describe it in different ways because they saw it in different perspectives. Yet no matter how much they differ in their description of details, they will all refer to the tulip, not to their own acts of perception. Otherwise they could never talk about the tulip. Each of them would be imprisoned in their own subjective world of individual experiences.

Ockham sees the danger that his position risks collapsing into a devastating form of subjectivism. He attempts to avoid it by distinguishing between a first and a second object: the first object is one’s own earlier cognition, and the second is the object of that cognition. He illustrates this distinction with an example.⁵² Suppose that I heard a professor in a discussion at the university. If I later remember this situation, my first object will be my earlier act of hearing, and my second object will be the professor, i.e. the object of my earlier act. I can therefore very well say that I remember the professor, but only insofar as he is my second (or indirect) object. And if many people who were present at the discussion

50 *Reportatio* IV, q. 14 (OTh VII, 292).

51 *Reportatio* IV, q. 14 (OTh VII, 295).

52 *Reportatio* IV, q. 14 (OTh VII, 296–297).

later remember the professor, they are entitled to say that they remember the same object, namely the professor, but again only insofar as he is their second (or indirect) object.

In drawing a distinction between two objects, Ockham tries to find a midway position between pure objectivism and pure subjectivism. On the one hand, he stresses that we do not simply remember things as past things. We remember them insofar as we perceived them in the past. Metaphorically speaking, we see them through the glasses of our own earlier cognitions. Since every person wears their own glasses, every person has different access to the past. On the other hand, Ockham makes clear that there are real objects – even objects common to many persons – which we see through the glasses. That is why we can talk about the same objects of memory, and we can even characterize them in similar ways. Or for short, there is the same objective world seen through many subjective glasses.

Ockham draws this crucial distinction in his analysis of the memory of the separated soul.⁵³ His interest in this fleshless creature is not simply theological in origin, as one might assume, but first and foremost a philosophical one. He wants to explain how purely intellectual activity can provide memory – activity that can be found in an embodied soul as well as in a separated one. It is therefore not surprising that he pays no attention to physiological processes that lead to the acquisition and storage of sensory images. Nor does he look at possible errors in the storage and reactivation of images. His aim is to relocate memory: as soon as we see that nothing but intellectual habits and second-order cognition are required for memory, we can focus on the intellectual capacity alone. Analyzing memory amounts to scrutinizing the highest capacity in human beings.

5 Early modern debates: Italian commentators on Aristotle's *De memoria*

Issues concerning the definition, localization, and psychophysiology of memory as one of the activities “common to body and soul”, as Aristotle had presented it in the opening chapter of *De sensu*,⁵⁴ were still the object of heated debates among philosophers and doctors in the sixteenth and early seventeenth century. This is especially true if one looks at those intellectual and institutional contexts – e.g. Italian universities – in which the study of Aristotelian natural philosophy and psychology mainly developed within the framework of medical faculties and in close interaction with – sometimes, in reaction to – theories and approaches to the ‘soul-body relationship’ deriving from the Galenic medical tradition.⁵⁵ As a consequence of this interaction, as well as of a reappraisal of Averroistic rationalistic and deterministic attitudes,⁵⁶ on the one hand, and of Alexander of Aphrodisias’s views on soul and intellect on the other,⁵⁷ a number of ‘materialistic’ readings of Aristotle’s hylomorphist account of the ensouled body and its activities regained strength as early as the first half of the sixteenth century not only against the main assumptions of Scholastic psychology, but also in contrast to a contemporary neo-Platonizing trend in

53 It is significant that he does not pay attention to this distinction in his earlier (and much cruder) theory of memory that ignores the state of separated souls; see *Reportatio* II, q. 12–13 (OTH V, 261–267). On the doctrinal development, see McCord Adams 1987, 515–525.

54 *Sens.* I, 436a8–10: “The most important characteristics of animals, whether common or peculiar, are clearly those which belong to both soul and body, such as sensation, memory, passion, desire and appetite generally...”

55 See Schmitt 1985, 1–15; Schmitt 1975; De Angelis 2010, 64–142.

56 See Giglioni 2010 (esp. 1–3).

57 See Kessler 2011. On the relationship between Averroism and Alexandrism within Italian Aristotelianism see for example Kristeller 1990.

Aristotelian natural philosophy whose impact was particularly strong in the intellectual milieu of Florence and Naples.⁵⁸

These developments within early modern Italian Aristotelianism are also reflected in the rise of contrasting views on nature and localization of memory and can be fully appreciated by looking at how sixteenth-century commentators on Aristotle's *De memoria* dealt with two of the most controversial, yet essential, issues raised by this text, namely (a) the localization of memory in the perceptual part of the soul;⁵⁹ (b) the characterization of imagination (*phantasia*) and its association with the "common sense" (*koine aesthesis*) and the "primary perceptual part" (*proton aisthetikon*). Aristotle hints at the connection between the notions of *phantasia*, *koine aesthesis* and *proton aisthetikon* in the section of the first chapter in which he considers the role of *phantasia* in remembering and in thinking and addresses the question why it is impossible for us to think without a phantasm, in other words to think anything without continuity. However, Aristotle argues,

it is necessary to cognize magnitude and movement with the same faculty with which time is also cognized, and the phantasm is an affection of the common sense (*pathos koinos aestheseos*); so it is clear that the cognition (*gnosis*) of these [magnitude, movement, time] belongs to the primary sense faculty (*toi protoi aisthetikoi*).⁶⁰

It is precisely this double link of memory to the *proton aisthetikon* and the thinking faculty – 'essential' the former, 'accidental' the latter –, and the connection between 'primary and common sense' and *phantasia*, that is worth investigating in relation to the Italian commentary tradition, for three main issues are here at stake: given that memory belongs to the perceptual part of the soul and more precisely to the *proton aisthetikon* (and therefore needs a bodily organ), where is it localized in the body? Second, how is the 'accidental' connection of memory and thinking to be understood and what theoretical and/or empirical arguments are there for or against this connection? Third, do the notions of common sense, *phantasia* and memory refer to the same faculty? Are they simply different denominations, or perhaps different aspects or manifestations of the same faculty? Do they depend on the same bodily factors and do they have the same localization in the body?

As regards the localization and the bodily organ of memory, sixteenth-century commentators had to deal with two different, even conflicting, theoretical options: a cardiocentric view, based on Aristotle's recurrent references to the region of the heart as the seat of the vegetative and sensitive soul and supported for example by Michael of Ephesus, who in his commentary on the *De memoria* defined the heart as the *aistheterion* of the 'first and common' *aisthesis*, and an encephalocentric view,⁶¹ according to which memory has its physical seat in the posterior brain ventricle. This view was already rooted in Galen's account of the pathophysiology of memory (as regards a generic localization of memory processes in the brain)⁶² as well as in Nemesius' first tentative localization

58 The relationships between Neo-Platonism and Aristotelianism (and especially between Marsilio Ficino's philosophy and the thought of three Aristotelians such as Nicoletto Vernia, Agostino Nifo and Marcan-tonio Zimara) have been extensively investigated by Mahoney 2000.

59 See *supra*, § 1.

60 450a9–12: μέγεθος δ' ἀναγκαῖον γνωρίζειν καὶ κίνησιν ᾧ καὶ χρόνον• [καὶ τὸ φάντασμα τῆς κοινῆς αἰσθήσεως πάθος ἐστίν] ὥστε φανερόν ὅτι τῷ πρώτῳ αἰσθητικῷ τούτων ἡ γνώσις ἐστίν.

61 *In Parv. Nat. Comment.*, I, 15–19 Wendland (CAG, XXII/1): ἐπειδὴ γὰρ ἡ μνήμη πάθος ἢ ἕξις ἐστὶ τῆς κοινῆς αἰσθήσεως, ὡς ἔσται δῆλον, ὅτε περὶ τούτων λέγει, ἥτις κοινὴ αἴσθησις ἐν τῷ πρώτῳ αἰσθητηρίῳ καθίδρυται, ἔστι δὲ πρῶτον αἰσθητήριον, ὡς πολλάκις εἴρηται, ἡ καρδία.

62 For Galen's deliberations on the localization of memory in the brain and as 'part' of the *hégemonikon*, see *De Loc. Aff.* VIII.174.16–175.7 K; PHP 438.28–34 (De Lacy); UP. I.641.11–19 Helmreich; QAM 11.1–9 Bazou / IV. 771–772 K. On pathophysiology of memory, see *De Loc. Aff.* VIII. 160.8–168.14 K.; *De Symp. Caus.* VII 200.15–201.5 K.

of the psychic faculties in the brain ventricles (as regards the specific localization in the posterior ventricle);⁶³ it was, however, fully developed only within Arabic Aristotelianism – see, for example, Averroes' *Compendium in Parva Naturalia*⁶⁴ – as part of the theory of the internal senses and as such received and further reworked by all the major figures of Latin Scholasticism.

Among the Italian commentators of the sixteenth century we find at least three different approaches to the question of the seat of memory: the first, which we could define as encephalocentric 'with qualification,' is quite in line with what had been elaborated within Arab and Latin Medieval Aristotelianism and is perfectly exemplified by Simone Simoni's (1532–1602) way of harmonizing Aristotle's and Galen's views. Simoni, who had received a medical education and was a professor of medicine and who is also famous for his quarrels with Schegk on the relations between philosophy and theology, is aware of the contrast between Aristotle, who identified the heart as the origin and the source of the affections and faculties of the sensitive soul, and Galen, who regarded the brain as the origin and seat of those faculties and affections.⁶⁵ Nevertheless, Simoni argues that there is substantial agreement between Aristotle and Galen as regards the place in the body where the 'simulacra' and images of external objects are received, and this place would be the brain.⁶⁶ Simoni's reading of the Aristotelian psychophysiology of sense perception clearly follows an interpretative strategy here, which Albertus Magnus had adopted earlier, for example in his commentary on the *De somno et vigilia*, in order to produce an account of the cognitive processes which, while declaring that it is 'Aristotelian,' was nevertheless not at variance with the evidence provided by the anatomical investigations of the brain: this strategy consisted in conceiving of both heart and brain as centers or 'origins' of the faculties of the sensitive soul, with a substantial qualification, however: while the brain was defined as the *seat* of the physical processes through which these faculties of the soul were actualized, the heart was regarded as the seat of the soul itself, and therefore as the ultimate source, and the *causa prima*, of these faculties.

A second, quite opposite, approach to the question of the localization of memory is characterized by an unequivocal endorsement of the cardiocentric view and a polemical rejection of some key points of the theory of the internal senses. A perfect example of this approach is provided by Bernardino Crippa's (fl. mid-16th cent.) commentary on the *De memoria*, in which the claim that the heart is the seat of the memory processes is coupled with a starkly materialistic representation of these very processes. Crippa defines memory as an "affection" or "state" of the common sense, or of the soul, which is the principle of sensation, and in which phantasms are impressed and informed (*imprimuntur et informantur*) through *phantasia*. This parallel between common sense and soul is further developed by Crippa in what follows, as he argues that the common sense must be located in the heart as its natural seat, and,

63 Nemesius, *On the Nature of Man*, ch. 13,32–38 (p. 121 Sharples-van der Eijk): τὸ μὲν οὖν φανταστικὸν παραδίδωσι τῷ διανοητικῷ τὰ φαινόμενα • τὸ δὲ διανοητικὸν ἢ διαλογιστικὸν παραλαβὸν καὶ κρίναν παραπέμπει τῷ μνημονευτικῷ. ὄργανον δὲ καὶ τούτου ἢ ὄπισθεν κοιλία τοῦ ἐγκεφάλου, ἢν καὶ παρεγκεφαλίδα καὶ παρεγκρανίδα καλοῦσιν, καὶ τὸ ἐν αὐτῷ ψυχικὸν πνεῦμα.

64 Averroes, *Comp. De Mem. Et Rem.*, 195vb44–64 (p. 57–59 Shields).

65 Simone Simoni, *In librum Aristotelis de Sensuum instrumentis et de his quae sub sensum cadunt, commentarius*, apud Joannes Crispinus, 1566, 271: "enumeravimus supra animae sentientis passiones seu facultates: has in corde tanquam in sua origine et fonte esse de sententia Aristotelis certum est; Galenus econtra cerebrum earum originem et sedem esse statuit."

66 Simone Simoni, *In librum Aristotelis de Sensuum instrumentis et de his quae sub sensum cadunt, commentarius*, apud Joannes Crispinus, 1566, 271: "in hoc tamen conveniunt, quod simulachra et imagines rerum extrinsecus obiectarum in cerebro recipiantur."

since the activity of the sensitive soul is common to the body, all the impressions and representations (*impressiones et informationes*) of the *phantasms* must be received necessarily in the common sense and in the heart at the same time.

For this reason and since memory is hampered by excessive cold and wetness, Crippa concludes, it cannot be doubted that the *vis memoriae* is located not in the posterior part of the brain, which is the coldest and wettest organ of the body, but in the heart.⁶⁷

Crippa's materialistic approach becomes even more evident in his rejection of the idea that memory is an intellectual or, as Crippa says, a "mental" faculty (*memoriae vim, atque facultatem non in ipsa mente*). On the one hand, Crippa takes up quite an exceptional position among the commentators on the *De memoria* in that he argues that memory is a faculty that grasps universals rather than *singularia* and belongs to the passive and mortal intellect (*intellectui patibili, atque mortali, in quo memoriae vis inest*).⁶⁸ On the other hand, however, Crippa produces quite an articulate argument, in which he tries to establish that the process of abstracting universals from individuals, far from being a prerogative of mind, already begins in the external senses, which – as he says – start knowing and perceiving the sensible species as universals, although still proximate to the individuals, and can be considered to be accomplished even in its very first stages, that is when the soul, and more precisely the common sense, receives species and forms of external objects without their matter as *phantasms*.⁶⁹ This prompts Crippa to look at the passive intellect and common sense as coinciding faculties, as he explicitly defines them when arguing that the *vis memoriae* "is necessarily located not in the mind, but in the passive and mortal intellect, which is the common sense."⁷⁰

Another commentator who takes the heart to be the seat of the common sense and therefore the seat of memory is Leonico Tomeo (1456–1531)⁷¹, although his overall account of memory is clearly at variance with Crippa's materialistic approach to the question of whether Aristotle conceives of memory exclusively in passive or also in active terms. While Crippa stresses the receptive and passive character of the memory process, described in terms of a concrete physical impression taking place *both* in the soul *and* its bodily seat, Tomeo proceeds in a very different way, making a very sharp distinction between the soul as a formal principle and true agent of cognition and the heart as *proton aistheterion* acting as an instrument of the soul. He thus ends up with a (neo)-Platonizing reading of the Aristotelian notion of "things common to the soul and the body". This is perfectly in line with Tomeo's overall commitment to making sense of the differences between the Aristotelian and the Platonic theories of memory and eventually harmonizing what *prima facie* seems an account of memory as pure "affection" (*passio*) – the Aristotelian account – and the Platonic active conception of memory, according to which memory arises as the result of a voluntary conscious act that the soul performs on materials provided by the body through sense perception, while keeping itself distinct from the body.⁷² In this connection Tomeo argues that the attribution to Aristotle of a 'passive' conception of

67 Bernardinus Crippa, *In Aristotelis librum de memoria et reminiscencia*, apud Alexandrum Benacium, Bologna 1567, 28–29.

68 Bernardinus Crippa, *In Aristotelis librum de memoria et reminiscencia*, 52.

69 Bernardinus Crippa, *In Aristotelis librum de memoria et reminiscencia*, 31.

70 Bernardinus Crippa, *In Aristotelis librum de memoria et reminiscencia*, 52: "unde memoriae vi, atque facultatem non in ipsa mente, sed in patibili, mortalique intellectu, qui est communis sensus, necessario sitam, atque locatam esse."

71 Leonico Tomeo, *Aristotelis Stagiritae parva quae vocant naturalia*, Paris: apud Simon Colinaeum, 1530, 73: "Quoniam enim memoria vel passio est et affectio vel habitus communis appellati sensusque primum nuncupavimus sensum ut cum de illa verba fient manifeste comprehendere licebit: qui sane communis sensus in primo collocari constituitque sensiterio censetur quod ipsum esse cor a physicis pene omnibus pro certo tenetur."

72 Bernardinus Crippa, *In Aristotelis librum de memoria et reminiscencia*, 78.

memory requires qualifications, as “the Peripatetics do not at all want that the affections and the impressions resulting from sensible things take place in the soul, but in the first organ of sensation (*in primo sensiterio*): but to the soul in itself pertain the judgment and the action concerning those things (*animae autem ipsius esse iudicium et actionem circa illa*)”⁷³

A similar attempt to make sense of specific issues of Aristotle’s theory of memory by adopting neo-Platonizing lenses is also to be found when it comes to explaining what Aristotle meant when claiming that memory can also be accidentally of intelligible things, while not belonging to the rational part of the soul. This is, for example, the case in Chrisostomo Javelli (1470–1538), who looks at the Aristotelian account of the relationship between memory and intellect in the light of the theory of the two memories. This theory, which had been put forward by Pierre d’Auvergne and above all by Duns Scotus, developed theoretical elements originating from Neo-Platonic and Augustinian thinking and claimed the existence of a sensitive memory whose objects are individual and time-bound sensible images, and a distinct intellectual memory whose objects are intelligible universal forms, abstracted both from matter and from time. Javelli is very careful in *not* attributing to Aristotle the theory of the two memories. Rather, he tries to point out the reasons why Aristotle focused on one of the two *actually existing* forms of memories; in other words, he tries to justify Aristotle from a theoretical perspective different from, and in many ways conflicting with, Aristotle’s own views. This way of argumentation becomes particularly clear when it comes to explaining Aristotle’s claim that men can “accidentally” have memory of intelligible things. Javelli points out:

Notice that while one can admit the existence of memory in the intellective part [of the soul] in man; nevertheless, it cannot actualize itself without sensitive memory, since man does not grasp the universal if not in a *phantasm*.⁷⁴

Javelli’s strategy can be here considered as a fully Scotist one for two reasons: first, because Duns Scotus’ theory of the dependence of the intellectual on the sensitive memory, which presupposes the existence of two essentially distinct kinds of memory, is applied to explain why Aristotle attributed memory only to the sensitive part of the soul, so denying any character of ‘essentiality’ to the memory of intelligible objects; second, because Scotus himself, in the fourth book of his *Ordinatio*, had tried to defend the statements of the Aristotelian *De memoria* and had presented his own theory as consistent with Aristotle’s.⁷⁵

In order to better appreciate the Scotian background of Javelli’s reading of the *De memoria*, let us briefly look at another commentator, Antonio Scaino (1524–1612), who, in reading Aristotle’s *De memoria*, takes an overtly anti-Scotian stand. Up to a certain point Scaino’s line of reasoning runs parallel to Javelli’s, since they both recognize that for Aristotle memory is ‘essentially’ of sensible forms and only accidentally of intelligible forms. But then Scaino makes explicit reference to Scotus’ theory of the intellectual memory and rejects it not only as incompatible with the Aristotelian account but also as intrinsically false on the basis of the following argument: “before the intellective soul is made singular, it is the place of forms (*locus specierum*) only potentially; when the soul is made singular, then it is said to be in actuality, in such a way that it can think, which it could not do before.” No *actual* thinking and therefore no reception, retention and

73 Bernardinus Crippa, *In Aristotelis librum de memoria et reminiscencia*, 79: “Peripateticos enim haud quaque velle passiones impressionesque illas a sensibilibus rebus in anima fieri sed in primo sensiterio: animae autem ipsius esse iudicium et actionem circa illa.”

74 Chrisostomo Javelli, *Epitome in librum De memoria et reminiscencia*, in *Opera... in tres tomos digesta*, Lugduni 1580, vol. I, 334: “Et adverte quod licet detur in homine memoria in parte intellectiva: tamen non potest exire in actum suum sine memoria sensitiva, quoniam homo pro hoc statu non intelligit universale nisi in phantasmate.”

75 Johannes Duns Scotus, *Ordinatio* IV, 45, 3, ed. A. Wolter and M. McCord Adams (1993), 201 and 203–206.

recollection of intelligible forms is granted by Scaino to a disembodied and universal intellect; on the other hand, once the intellectual soul is individualized, it thinks because it is informed by the light that the agent intellect directs to the forms of things.⁷⁶

Scaino's rejection of intellectual memory fits a materialistic representation as well as a cardiocentric and explicitly anti-Galenic localization of the memory processes, which have much in common with Crippa's reading of the *De memoria*. Scaino proceeds from the definition of memory as an affection concerning the primary sense faculty, and that of primary sense faculty as the 'place' in which one has *cognitio phantasmatum*, to the localization of this place in the heart. He then puts forward the supposition that in the primary sense faculty and more precisely in its organ or even better in its spirits are placed *both* the common sense, which is the soul's faculty that judges all the sensibles coming from the external senses, *and* the imaginative faculty, which is concerned with phantasms, *and* memory.⁷⁷ In order to defend the cardiocentric localization of both *phantasia* and memory against the encephalocentric hypothesis, Scaino refers to and tries to reverse the empirical argument ascribed to Galen, and adopted by many commentators starting from Averroes, according to which the localization of phantasia and memory, respectively, in the anterior and posterior ventricles of the brain can be demonstrated by looking at the different consequences of brain injuries in which only one of these ventricles is damaged. According to Scaino, the fact that failures of memory as well as of the imaginative faculty are to be observed in connection with brain injuries does not prove that such faculties are located in the brain, as there is a "concomitance" – as he defines it – between brain and heart, consisting in the fact that the spirit first produced in and by the heart is then refined and brought to perfection in and by different parts of the brain. Therefore, although brain injuries causing damage to the spirits can be detrimental to memory and *phantasia*, nonetheless, this is not enough to disprove that memory and *phantasia* reside in the heart as in their principal/peculiar source.⁷⁸

One commentator who makes special efforts to combine a close and faithful reading of Aristotle's text with a broader consideration of how the various streams of the Peripatetic tradition have coped with the two issues at stake here – localization of memory and individuation of an 'intellectual memory' – is Agostino Nifo. As regards the seat of memory and its relation to *phantasia* and common sense, Nifo first of all points out that Aristotle makes no difference between common sense and phantasia, for, as he puts it, common sense is a *phantastica virtus*. At the same time Nifo defines a phantasm as an affection of both the *virtus memorativa* and the common sense, which are to his mind the only two internal senses admitted by Aristotle: a phantasm is an affection of the *virtus memorativa* insofar as it is stored in memory, which, as Nifo argues, "is perhaps in the brain" (*haec fortasse est in cerebro*). However, a phantasm is also an affection of the common sense, which Nifo locates in the heart, insofar as a phantasm is experienced

76 Antonio Scaino, In librum de Memoria et Reminiscentia, in *Paraphrasis cum adnotationibus in libr. Aristot. De Anima*, Venetia 1599, 68: "anima intellectiva est locus specierum potentia, antequam sit facta singula; facta deinde singula, sic in actu dicitur esse, ut possit intelligere, quod antea praestare non poterat. Intelligitur autem anima facta singula, quoniam sit formata virtute luminis intellectus agentis in ipsas species rerum."

77 Antonio Scaino, In librum de Memoria et Reminiscentia, in *Paraphrasis cum adnotationibus in libr. Aristot. De Anima*, Venetia 1599, 62: "Unde supponendum est, in corde residere ipsum primum sensitivum, et in ipsius spiritibus consistere, tum sensum communem, eam nimirum facultatem animae, quae iudicat omnia sensilia sensuum exteriorum; ut explicatum est in libro de sensiteriis et sensibilibus, et in libris de anima; tum phantasiam, quae proprie constituitur circa phantasmata, quatenus seorsum ab operatione sensuum exteriorum, species sensilis recepta apparet huic facultati animae, adeo ut illam persentiat, et quasi oculis perficiat; tum denique memoriam, quatenus contingit rei praeteritae notitiam in anima sentiente repeti sub quadam temporis connotatione."

78 Antonio Scaino, In librum de Memoria et Reminiscentia, in *Paraphrasis cum adnotationibus in libr. Aristot. De Anima*, Venetia 1599, 67.

by “being presented to the common sense” (*sensui communi obiciuntur*).⁷⁹ Here it is clear that Nifo wants to save at least the core assumptions of the encephalocentric theory of the internal senses without betraying Aristotle’s cardiocentric views. And this attempt to harmonize encephalocentrism and cardiocentrism becomes even clearer when we look at Nifo’s threefold definition of memory. He argues that memory can be understood: (1) as a *potentia* that stores the phantasms, and as such this faculty cannot belong either to the intellect or to the common sense, but has to be located in the brain; (2) as an image or appearance left in this *potentia memorativa* as the result of an apprehension that took place in the past, and in this respect memory is said to belong *subiective* to the *virtus memorativa* (that is to say, to the brain), but ‘*ut obiectum*’ to the common sense; (3) as the very act of remembering, and in this third sense it is said to belong essentially (*per se*) to the common sense (that is, to the heart), accidentally to the intellect.⁸⁰

This reference to the accidental manner in which the intellect takes part in remembering brings us to consider how Nifo dealt with the question of whether Aristotle admitted the existence of an intellectual memory and whether such memory is conceivable at all.

Nifo is perfectly aware that not only Aristotle but also the whole Peripatetic tradition denied the existence of a memory belonging to the intellectual part of the soul, although, he says, “it is not clear why they did so.” An explanation could be that for Aristotle there is no distinction in the intellect between the faculty of grasping and that of retaining the intelligibles, whereas the sensitive part of the soul is endowed with two distinct faculties – common sense and *virtus memorativa* – and two distinct organs – heart and brain –, each of which is responsible, respectively, for knowing and for retaining the sensible forms, once these forms have been grasped by the senses. For this reason, memory has to be located in the sensitive part of the soul, whereas affirming that memory belongs to the intellect is to say something equivocal.

Nevertheless, Nifo somehow reintroduces the notion of intellectual memory by arguing that memory is twofold: one, absolute and independent, which belongs to the sensitive part of the soul; the other, intellectual and dependent, in that its actualization depends on something else than intellect, viz. sense, for the soul never knows without a phantasm. For these reasons, Nifo concludes, “Aristotle says that ‘absolute memory’ belongs only to the sensitive part of the soul, but *does not deny that a dependent memory belongs to the intellect*”⁸¹ Here the echo of Duns Scotus’ ‘dependency argument’, which we have already referred to in connection with Javelli’s treatment of sensitive and intellectual memory, is undeniably strong.

6 Conclusion

Debates about the definition, localization and function of memory did not come to an end with Italian Aristotelians in the sixteenth century. They continued throughout the early modern period and had a strong impact on the development of theories of cognitive capacities.⁸² This is hardly surprising, given the importance memory has as a

79 Agostino Nifo, *Parva Naturalia Augustini Niphi Medices Philosophi Suessani*, apud Scotus, 1550, 77.

80 Agostino Nifo, *Parva Naturalia Augustini Niphi Medices Philosophi Suessani*, apud Scotus, 1550, 77.

81 Agostino Nifo, *Parva Naturalia Augustini Niphi Medices Philosophi Suessani*, apud Scotus, 1550, 78: “Aristoteles ergo absolutam memoriam solum ad sensualem partem attinere dicit, non tunc negat dependentem memoriam ad intellectum pertinere?”

82 For an overview, see Hatfield 1998. Note that memory played a crucial role not just in the extensive debates about human cognitive capacities, but also in those dealing with non-human capacities. Some authors (e.g. Montaigne) claimed that animals have true memory and therefore also true knowledge, whereas others (e.g. Descartes) denied that animal memory goes beyond the mechanical storing of sensory inputs. It was in fact memory that was adduced as evidence for or against the claim that animals have knowledge. For a detailed analysis, see Gontier 1998; Wild 2006.

capacity that enables human beings to re-identify things, to compare them and to grasp their temporal dimension. Medical and philosophical investigations went hand in hand in all these debates, as it was only a solid empirical (i.e. anatomical and physiological) analysis that made it possible for philosophers to make well-grounded claims about the localization of memory. Moreover, detailed knowledge of injuries and diseases made it possible to explain why and how human beings sometimes fail to have accurate memory. In fact, an analysis of bodily causes that are responsible for distorted memory proved to be of crucial importance, since it made clear what kind of processes are required for successful memory – dysfunctional cases shed light on the structure of well-functioning cases.

Yet it was not only its function as a specific cognitive capacity that made memory an important subject of analysis. As has become clear in the preceding sections, it was also a more general problem that attracted the interest of many physicians and philosophers. They all agreed that we cannot understand what memory is unless we relate this cognitive capacity to other capacities, in particular to those responsible for sensation, perception, imagination and intellection. But how are all these capacities related to each other? What is the general ‘architecture of the soul’? And how is this architecture related to the body and its parts? This array of questions shows that the examination of memory was motivated by a deeper theoretical interest in the general structure of the soul-body compound. A large number of thinkers, ranging from Aristotle to Agostino Nifo, thought that it is precisely the analysis of memory that leads to a better understanding of this compound, because memory makes clear that the capacities of the soul are intimately connected with parts of the body. Some even assumed that there is a one-to-one correspondence: each capacity of the soul can be assigned to a specific part of the body.⁸³ It is therefore hardly surprising that they focused on the correct localization of memory, debating about cardiocentrism and encephalocentrism. If we successfully indicate the place of this particular capacity in a part of the body, they argued, we gain an insight into the connection between soul and body. If we then relate memory to other capacities, which all have their specific place in the body, we can reconstruct the entire architecture of the soul insofar as it is manifest in the body. Or in short, we can detect the soul in the body.

Given this interest in a general picture of the soul-body compound, memory was a test case for general theories about the place and the functioning of the soul in the body. Medical and philosophical analyses of memory are therefore to be seen as crucial ingredients of a larger project that aimed at explaining the mapping of soul and body.⁸⁴

83 This claim was explicitly made by Nemesius (see § 3).

84 This paper is based on collaborative work in the research group *Mapping body and soul* (D-2). Philip van der Eijk is responsible for sections 1 and 3, Ricardo Julião for section 2, Dominik Perler for sections 4 and 6, and Roberto Lo Presti for section 5.

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