# REMEMBERING RELIGION: TRACES OF A MNEMONIC NATURE

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ABSTRACT

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Although memory is universally recognized as a fundamental, perhaps even *the* fundamental, capacity of an active and healthy brain, philosophers, artists, scientists, and theologians alike are still coming to appreciate exactly what it is, what it does, and how and why it ultimately matters. Accounting for some of the reasons behind this uncertainty establishes the general preoccupation of this entire project. With a focus on episodic, or autobiographical, memory in particular the middle chapters offer a top-to-bottom rendition of episodic memory with recourse to scientific investigations and analyses at different levels of inquiry from Endel Tulving's neuropsychology to Eric Kandel's neurobiology. In the chapters before and after this cognitive neuroscientific account of episodic memory there are engagements with several notable philosophers of memory from the philosophical theologian of antiquity, Augustine of Hippo, to the emergent proponent of religious naturalism today, Loyal Rue. Working at the intersection between brain science and the academic study of religion, this project serves as one contemporary response to the longstanding intellectual and religious preoccupation with all things mnemonic, an interest that extends through the socratic philosophers, Plato and Aristotle, to the modern philosophers, James and Bergson and beyond. While many mnemonic mysteries still remain, new insights arise when philosophers and theologians duly consider the findings of memory scientists. Episodic memory's religious significance, this project concludes, is pronounced as it impacts the crafting of one's self-identity through time as selves simultaneously join with others to create, maintain, and even reimagine their communal contexts.

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## *Chapter 1*
## *Intrantes Mysteria Memoriae: Picking up the Traces*

> *If any one faculty of our nature may be called more wonderful than the rest, I do think it is memory. There seems something more speakingly in comprehensible in the powers, the failures, the inequalities of memory, than in any other intelligence. The memory is sometimes so retentive, so serviceable, so obedient - at others, so bewildered and so weak - and at others again, so tyrannical, so beyond controul [sic] - We are to be sure a miracle in every way - but our powers of recollecting and forgetting, so seem peculiarly past finding out.*[1]
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> *When we face a problem, we may not know its solution, but we have in sight, increasing knowledge, and an inkling of what we are looking for. When we face a mystery, however, we can only stare in wonder and be wilderment, not knowing what an explanation would even look like.*[2]

Mysteries and problems reside at different points along the continuum of ignorance. The former, situated at one end, elicits invocation. The latter, residing somewhere in the middle, calls for additional investigation. Problems suggest answers and indicate a way forward, while mysteries leave us at a total loss, if not just plain lost, and aswirl in questions. Both attract our attention and even irritate our desire to understand what is really going on. When we face a mystery insight dissolves or, perhaps it is more often the case, insight prodigiously multiplies bombarding us with an overabundance of possibilities. Either way, we are left bewildered.

It may be that Pinker's distinction is conceptually or phenomenologically helpful. But surely the ignorance quotient is based on a sliding scale. Knowledge,

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[1] Jane Austin, *Mansfield Park*. (New York: Penguin Books, 2003)

[2] Steven Pinker, *How the Mind Works*. (New York: W. W. Norton & Co, 1997), ix.

after all, is a moving target. Yesterday's mysteries are today's problems and today's problems often become tomorrow's presuppositions. But, only next year, we may find ourselves mystified by the presuppositions we once held. In this chapter I am neither interested in rationalistically slaying nor uncritically serving longstanding appraisals of memory. Rather, I endeavor to slide along its continuum, discussing those perspectives which have both revered its mysteries and struggled with its problems.

Prominent engagements with mnemonic phenomena will be selectively presented below and, through them, we can begin to see how a number of towering philosophers and theologians have embraced, elided, revered, or overcome the complexities of memory. While many of the portrayals discussed in this first chapter may be spiritually edifying or philosophically prescient, they often appear unresolved, haunted by a few common aporias. Every one of these impressive efforts, however, has left traces behind which serve as both partial answers and invitations to even deeper questions. As evidenced by the following thinkers, memory has been a persistent theological and philosophical preoccupation. And yet, there is no one best approach to this particular slice of intellectual history. A number of contemporary scholars of memory have certainly given us helpful ways to frame and understand memory's various thematics as they have been

explored more or less continuously from early antiquity to the present.[3] And while any pretension to comprehensiveness should be disregarded, these scholars of memory can certainly be applauded for highlighting durable conceptual cords to cling to when charting a way through such a complex territory. In this chapter I will hold to three such cords, giving each its own section, hoping to navigate paths through some of the aporias of memory. In each section I will not only introduce important tensions with respect to the study of memory, and a range of responses to these tensions, but I also intend to effectively move our inquiry across a vast, contestable intellectual terrain and properly justify the stance and direction taken in the chapters to follow. The first section is preoccupied with perspectives on the possible fonts of mnemonic phenomena. As we will see, philosophers of memory, particularly Plato, Aristotle, and Augustine, have been compelled to speculate on the intriguingly elusive sources of memory and recollection, albeit in different ways and for different reasons. The second section, by contrast, is not concerned with what may be absent but rather what presently remains of memory. As such, our inquiry will consider the myriad traces of memory. I will attempt to generally categorize traces into different kinds in order to effectively delve into the current fervor surrounding the meaning and importance of

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[3] Francis A. Yates, *The Art of Memory*. (Chicago: University of Chicago Press, 1966); Mary Warnock, *Memory*. (London: Faber and Faber, 1987); Edward S. Casey, *Remembering: A Phenomenological Study*. (Bloomington: Indiana University Press, 1987); Mary J. Carruthers, *The Book of Memory: A Study of Memory in Medieval Culture*. (Cambridge: Cambridge University Press, 1990); David Farrell Krell, *Of Memory, Reminiscence, and Writing*. (Bloomington: Indiana University Press, 1990); John Sutton, *Philosophy and Memory Traces: Descartes to Connectionism*. (Cambridge: Cambridge University Press, 1998); Paul Ricoeur, *Memory, History, Forgetting*. trans. Kathleen Blamey and David Pellauer, (Chicago: University of Chicago Press, 2004); Sven Bernecker, *Memory: A Philosophical Study*. (Oxford: Oxford University Press, 2010)

the memory trace. In the third, and final, section of this chapter I introduce another significant tension in any engagement with memory: its relationship to forgetting. The need to balance active remembering with needful forgetting will be highlighted in this section. When considered together, I will argue that these three sections suggest an indispensable link between our understanding of mnemonic phenomena and critical appreciations of religious experiences, beliefs, practices. The task throughout the rest of this project will be to elaborate this link.

***I. Of an Absent Presence: Whence does memory come?***

In his weighty volume, *Memory, History, Forgetting*, Paul Ricoeur credits Plato with introducing a lasting contribution to the philosophy of memory - a preoccupation with the "phenomenon of the presence of an absent thing."[4] Socrates asks Theaetetus and Theodorus, in a Platonic dialogue bearing the name of the former, "do you think you will find anyone to admit that one's present memory of a past impression is an impression of the same character as one had during the original experience, which is now over?"[5] Aristotle, in *On Memory and Recollection*, acknowledges that "someone might be at an impasse about how, when the thing one is concerned with is absent, but the experience of it is present, one remembers something that is not present."[6] That impasse, just one of the aporias of memory, has given philosophers pause ever since.

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[4] Ricoeur, *Memory, History, Forgetting*, 6.

[5] *The Collected Dialogues of Plato, Including the Letters.* eds. Edith Hamilton and Huntington Cairns, (Princeton, NJ: Princeton University Press, 1961), *Theaetetus* 166b.

[6] Aristotle, *On the Soul; and, On Memory and Recollection.* trans. Joe Sachs. (Santa Fe, NM: Green Lion Press, 2001), *On Memory and Recollection* 450a 26.

The here/not here nature of memory was a dynamic that fascinated both Plato and Aristotle. It troubled them to recognize that a bygone moment - formerly absent but now somehow reappearing - is not of the same nature as the original moment that inspired it. What is to be made of this difference? That is, what is it about memory that seems to necessitate multiple mental impressions which imperfectly match one another? It is within the context of this problematic layering of an original image and its imperfect copy that Socrates famously offers his now famous metaphor:[7] memory as a block of wax. In Plato's *Theaetetus* Socrates equates the memory of an original experience or sense perception - perhaps of a place or an event, a sound or a face - with marks left on wax by a pressed signet ring. Memory, according to this metaphor, is this marking event and whatever becomes of it over time.[8] Accordingly, some impressions are durable and remain clear while other marks much less so. "Whatever is so im-

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[7] For millennia, memory has borne the brunt of metaphor. An extensive textual history resounds with creative expressions which endeavor to confront the complex problems of memory or to capture something of its mystery. Douwe Draaisma writes: "From Plato's wax tablet to the computers of our age memory-related language is shot through with metaphors....It includes the most varied storage spaces: for information, such as archives and libraries; for goods, such as wine cellars and warehouses; for animals, such as dovecotes and aviaries; for valuables, such as treasure chests and vaults; for coins, such as the leather purses or sacculi used by medieval money-changers. Other metaphors are derived from landscapes: woods, fields and labyrinths. The hidden nature of memories is expressed in metaphors such as caves, grottoes, mineshafts, the depths of the sea. Buildings are also included in this imagery: palaces, abbeys, theatres. The memory has been seen as a magnet, stomach and a honeycomb, as a phosphorous ore, an Aeolian harp and a loom. Ever-changing images are projected onto our theories of memory, a succession of metaphors and metamorphoses, a true *omnia in omnibus*." *Metaphors of Memory: A History of Ideas about the Mind*. (New York: Cambridge University Press, 2000), 3.

[8] According to Ricouer, attentiveness to time remains implicit in Plato's analysis of memory whereas Aristotle was expressly invested in understanding the relationship between memory and time. *Memory, History, Forgetting,* 6.

printed we remember and know so long as the image remains".[9] But the original images are only as remarkable as our mind's wax is perfectly malleable - the wax must not be too small, too hard, or too soft, but rather it must be pure and just the right consistency, size, and thickness.[10] Our minds, the philosopher knows, are imperfectly indelible. Some experiences fail to impress. Many others melt slowly away. So much passes through our minds without a trace; "whatever is rubbed out or has not succeeded in leaving an impression we have forgotten and do not know."[11] For Plato, then, the quality of the wax makes all the difference.

> When a man has in his mind a good thick slab of wax, smooth and kneaded to the right consistency, and the impressions that come through the senses are stamped on these tables of the 'heart'…then the imprints are clear and deep enough to last a long time. Such people are quick to learn and have good memories, and besides they do not interchange the imprints of their perceptions but think truly. These imprints being distinct and well spaced are quickly assigned to their several stamps - the 'real things' as they are called - and such men are said to be clever.[12]

But, consider the opposite:

> When a person has what the poet's wisdom commends as a 'shaggy heart,' or when the block is muddy or made of impure wax, or oversoft or hard, the people with the soft wax are quick to learn, but forgetful, those with hard wax the reverse. Where it is shaggy or rough, a gritty kind of stuff containing a lot of earth or dirt, the impressions obtained are indistinct; so are they too when the stuff is hard, for they have no depth. Impressions in soft wax also are indistinct, because they melt together and soon become blurred. And if, besides this, they overlap through being crowed together into some wretched little narrow mind, they are still more indistinct. All these types, then, are likely to judge falsely. When they

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[9] *Theaetetus* 191e.

[10] *Theaetetus* 191c-d.

[11] *Theaetetus* 191e.

[12] *Theaetetus* 194c-d.

> see or hear or think of something, they cannot quickly assign things to their several imprints. Because they are so slow and sort things into the wrong places, they constantly see and hear and think amiss, and we say they are mistaken about things and stupid.[13]

The quality of the mind's wax is exceedingly important. For Plato, the best wax supports effective learning and true knowledge, creates clear distinctions and right judgment, and has that peculiar power to preserve and make visible again what was, for a time, absent from the mind's eye. Considering its exceptional significance, Plato wonders: whence does this wax come? Socrates, "lending a tone of solemnity to the hypothesis,"[14] remarks, "Let us call it the gift of the Muses' mother, Mnemosyne."[15] One's wax, the philosopher contends, has a divine provenance.

Aristotle's engagement with memory, by comparison, draws our attention to another kind of absent presence. The philosopher suggests that the elusive origins of memory are, at base, physiological. Like Plato, Aristotle considers the same metaphor and its waxing taxonomy. But Aristotle fruitfully complicates the impasse of the presence of an absent thing by, first, distinguishing between memory (*mneme*) and recollection (*anamnesis*)[16] and, second, emphasizing the importance of the pressing action itself.[17]

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[13] *Theaetetus* 194e-195a.

[14] Ricoeur, *Memory, History, Forgetting*, 13.

[15] *Theaetetus* 191d.

[16] Joe Sachs, "Introductory Note to *On Memory and Recollection,"* 166.

[17] *On Memory and Recollection* 451b 10-30.

As the title of his short treatise on the subject indicates, Aristotle distinguishes between having a memory and achieving a recollection.[18] He describes the former as an affection, the "simple presence to mind," or what Ricoeur calls the "simple evocation" of a memory.[19] The latter is portrayed as the product of an active search or, in Ricoeur's words again, following Bergson, the "effort to recall".[20] According to Aristotle, memory images are more than simply what is established in the wake of perception. An image functions as "both a picture and a likeness".[21] That is, the act of perceiving etches an impression which carries at least two different modes of being.[22] Like a drawing on a tablet, an original impression is "something in its own right" and yet it can also be conceived of as a "certain kind of likeness or reminder" *of* something else.[23] That there are multiple images present to the remembering mind, according to Aristotle, is the inherent

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[18] Ricoeur, "Why the double title?" *Memory, History, Forgetting*, 15.

[19] Ibid.

[20] Ibid., 19.

[21] *On Memory and Recollection*, 450b 22.

[22] As David Farrell Krell explains, Arisitotle "describes the phantasm or mental image now postulated for memory as a figure sketched or painted on a panel, a figure that exhibits a fruitful ambiguity: the sketched of incised figure (*gegrammenon*) is, as it were, both an *objet d' art* (*zoion*) in its own right and a likeness or icon (*eikon*) of a living being….The *phantasmata* may thus be viewed, scanned, or 'read' in two ways, as objects of contemplation in their own right, as noemata and theoremes, or as portraits of something else." *Of Memory, Reminiscence, and Writing*, 17.

[23] *On Memory and Recollection*, 450b 24. King, R. A. H., King persuasively argues that Aristotle has not offered an 'image theory' of memory, despite the fact that he has been read this way for so long, but rather a representational theory of memory. *Aristotle and Plotinus on Memory.* (New York: Walter de Gruyter, 2009), 3-7.

outcome of the associative interaction between sense perception, memory, and knowledge.[24]

Aristotle's account of memory, however, does not fully address the here/not here impasse of mental imagery.[25] He must therefore discuss recollection. Unlike the simple evocation of a present memory, recollection takes more effort, and time. Recollections, for Aristotle, are the product of an active and deliberate search through mental images established sometime, and somehow, before the process of recall was even initiated. As such, "one is unable to recollect something right away, but having searched for it, one is able and discovers it."[26] Recollection is an active process, a search. Therefore, for Aristotle, recollection is interestingly implicated with his study of motion. Motion, particularly self-initiated motion, is a major characteristic of living material. According to the philosopher, movement and the making of mnemonic images are related because mental impressions, during and after a perception, are dependent on certain kinds of

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[24] For the Socratic philosophers, there is a definite relationship between memory and sense perception. The former was derived from the latter and, to the extent that a memory was well-preserved over time, sense perception becomes a foundation for knowledge. As an epistemological claim, this was once a rather uncontested construal. "The foundational role of memory is the preservation of knowledge acquired through sense perception." Paige E. Hochschild, *Memory in Augustine's Theological Anthropology.* (New York: Oxford University Press, 2012), 13. The interplay between perception, memory, knowledge, recollection, and time was not completely established in Platonic philosophy. For instance, Yates, addressing some of the differences between Socrates's students, writes: "But Plato, unlike Aristotle, believes that there is a knowledge not derived from sense impressions, that there are latent in our memories the forms or moulds of the Ideas, of the realities which the soul knew before its decent here below. True knowledge consists in fitting the imprints from sense impressions on to the mould or imprint of the higher reality of which the things here below are reflections." Yates, *The Art of Memory,* 37. See *Phaedo*, 75 b-d.

[25] As King argues, Aristotle's "intuitive view of memory" entails that a "living thing perceives something; residues of this perception are preserved and may serve as act of memory." *Aristotle and Plotinus on Memory,* 1.

[26] *On Memory and Recollection*, 452a 8.

movements which trace in "something like an outline of the thing perceived, in the same way people mark designs into things with rings."[27] Aristotle observes, moreover, that the changes inherent to morphological growth of the human animal will influence the success of later recollections.

> This is why, in people who are in vigorous motion on account of passion or their time of life, memory does not come about, just as if the motion and its impression fell upon flowing water; in others, on account of being worn down like old walls and because of hardness in the receptive part that is acted upon, the outline does not get into it. For these reasons, both the very young and the old are lacking in memory, for the former are in flux because they are growing, the latter because they are decaying. And similarly, neither the very quick nor the very slow display good memories, since the former are more fluid that is needed and the latter are more hardened.[28]

Leaving a good image behind necessitates that one's wax not only be of a certain quality, but also that the wax is impressed at the right time and in the right way. Only then, according to Aristotle, will a memory image be made to last.

The philosopher also knows that just because mental impressions are made to endure does not necessarily mean they will inevitably be found. Only time will tell. And Aristotle's consideration of time is fundamental to his study of memory.

> Of the now, in the now, there is no memory…but there is perception of what is present, expectation of what is in the future, and memory of what is past; hence, every memory is involved with time. And so, among the animals, only those that perceive time remember, and they do so by means of that by which they perceive it.[29]

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[27] *On Memory and Recollection*, 450a 31.

[28] *On Memory and Recollection*, 450b 1-8.

[29] *On Memory and Recollection*, 449b 26.

Unlike just holding a memory image in the mind right now, anamnesis is, temporally speaking, more complex. In recollecting the past, one must have the ability to perceive time and its passing. As Ricoeur notes, this essential Aristotelian insight "consists in the fact that the mark of anteriority implies the distinction between before and after, earlier and later….On this point, the analysis of time and the analysis of memory overlap."[30] The relationship between time and memory will be discussed at length in the next chapter, but presently, Ricoeur's point registers the fact that making basic distinctions, like before and after, earlier and later, is central for understanding mnemonic phenomena. Recollection demands distinctions. Discernment is therefore necessary to distinguish among the mental imagery that incessantly passes through the mind's eye. In other words, because the effort to recall necessitates that we re-encounter numerous impressions from our past, regardless as to what triggers an act of recollection in the first place, a certain measure of mental deliberation is required to judge which images sought and found are images of a past experience or images of something else. After all, both imagination and recollection rely on mental imagery. They differ, of course, with respect to their respective relationships to previously experienced events.[31] Near the end of *On Memory and Recollection*, Aristotle claims that our capacity for mental discernment of this kind helps to clarify the differences between various animals. He writes that

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[30] Ricoeur, *Memory, History, Forgetting*, 16.

[31] *On Memory and Recollection*, 450a 22.

> while many of the other animals have a share in remembering, none of the animals, insofar, one might say, as we know, except the human being, shares in recollecting. And the cause of this is that recollecting is a certain sort of reasoning; for the one who recollects reasons out that one saw or heard or had some such experience before, and this is a certain sort of inquiry. And this belongs by nature only to those in whom a power of deliberation is also present, since deliberating is also a certain sort of reasoning.[32]

Perhaps recollection, then, is only possible for the human animal. It involves a complex sort of reasoning with the power to experientially and temporally sift and sort through vast arrays of mental imagery with different temporal valences. Considering its complexities, Aristotle, like Plato before him, wonders: from where does this power come?[33] The philosopher is clear: it "must be present within".[34] Because our capacity for recollection implies movement, deliberative reasoning, and a perception of time and its passing, it must operate part and parcel with the human soul.[35] Such an assumption is consistent with the well known Aristotelian explications of the soul as the vital seat of a living being.

With Aristotle, then, the block of wax metaphor begins to tilt toward its material referents. He argues that recollective experiences are "in some respect bodily" because "it greatly disturbs some people when they cannot recollect

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[32] *On Memory and Recollection*, 453a 8-13.

[33] Similarly, David Farrell Krell writes: "Whence this 'portrait' of the absent being in question? The motion that took place in the soul and the part of the body that has the soul, replies Aristotle, 'inscribes a kind of imprint … of what is perceived, as people do who seal things with signet rings.'" *Of Memory, Reminiscence, and Writing*, 17.

[34] *On Memory and Recollection*, 451b 10.

[35] *On Memory and Recollection,* 450a 16.

something even when they concentrate their thinking strongly".[36] Such disruptions are bodily and often out of our control "just as it is no longer in the power of those who throw something to make it stop, so too the one who is recollecting and hunting sets some part of the body in motion, in which the experience takes place."[37] Even in this brief account, then, Aristotle's understanding of the basic dynamics of image making, while not completely able to resolve the impasse of the presence of an absent thing, attempts to physiologically ground memory. For this philosopher, memory and recollection are not just gifts of the gods, but largely predicated on the very motions of an ensouled body impressed and discerning at the right time and in the right way. Such movements make all the difference for Aristotle.[38]

Struggling to understand the impasse of the phenomenon of the presence of an absent thing has therefore encouraged these two ancient philosophers of memory to speculate about an absent source, the hidden whence beneath mnemonic phenomena. Their responses, when bandied together, effectively bookend a range of possible wellsprings for memory and recollection. The intellectual legacies of Aristotle and Plato suggest that memories are either the emergent products of beautifully elusive interior disturbances of one's own body as it perceives and comes to interact with the world or are, ultimately, gifts bestowed on us by the gods. Both perspectives have enjoyed lasting influence among

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[36] *On Memory and Recollection*, 453a 16.

[37] *On Memory and Recollection*, 453a 22.

[38] King, *Aristotle and Plotinus on Memory,* 20-25.

philosophers and theologians interested in interpreting the value and meaning of mnemonic phenomena. However, it is rare for a thinker to find a way to intertwine both socratic legacies within one broader vision. Augustine of Hippo, as we will see shortly, offers one such vision. In his writings on memory, Augustine reveres it as an indispensable bridge between god and humanity. Thus, the bishop renders memory and recollection in ways that theologically extend the philosophical insights of Plato and Aristotle for maximal existential and ecclesiological impact.[39] His perspective presents an impressive attempt to establish the religious significance of memory. In the context of this project, the integrative intent of Augustine's vision will be preserved, but newly conceptualized to let memory serve as a spiritually evocative, evolutionary bridge fundamentally conjoining humanity and nature.

*Augustine of Hippo*

> *There can be no higher compliment to human memory than to compare it to God the Father. To live in memory, then, is not to "live in the past" but to come near to the Beginning, the* origio*, in which God created all things and found them good.*[40]

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[39] It is unclear just how familiar Augustine was with Platonic philosophy in general or with the its mnemonic legacies in particular. Augustine claims to have been given "certain books of the Platonists, translated from Greek into Latin." *Conf*. 7.9.13, but just what was included in this *libri Plantonicorum* is a matter of scholarly debate. See Hochschild's *Memory in Augustine's Theological Anthropology,* 9-27. Similarly, scholars disagree about the extent of Augustine's knowledge of Aristotle as well. Ibid., 28-44. The bishop does mention that "when I was scarcely twenty years old, a book of Aristotle's entitled The Ten Categories fell into my hands". While he does report: "I read it by myself and understood it," (Conf. 4.16. 28) there is neither an indication that this work impacted Augustine's perspective nor is there any mention of other works by Aristotle. In this context is important to note that Augustine does not specifically mention Aristotle's *On the Soul* and *On Memory and Recollection* (*De Anima and De memoria et reminenscentia*.)

[40] *Saint Augustine's Memory.* Introduction and commentary by Garry Wills. (New York: Viking, 2002), 25.

A preeminent philosophical theologian within western Christianity, Augustine's veneration of memory is pronounced. "Few thinkers have pondered more deeply on the problems of memory and the soul than Augustine".[41] He plumbs the depths of his own memory so as to theologically elevate its intimate, inner mysteries. Awed by his own prodigious recollections, Augustine came to feature memory in his trinitarian reflections. In *On the Trinity,* he invokes a reflection of the Christian deity as a fundamental interplay of boundless love, endless wisdom, and God's all-encompassing memory.

> For how is he wise who remembers nothing, or who does not remember himself? Wherefore, because the Father is wisdom, and the Son wisdom, as the Father remembers Himself, so too does the Son; and as the Father remembers Himself and the Son, not by the memory of the Son, but by His own, so too the Son remembers Himself and the Father, not by the memory of the Father, but by His own. Who would say that there is any wisdom where love does not even exist? From this we conclude that the Father is His own love, in the same manner as He is His own understanding and His own memory. Behold these three, therefore: memory, understanding, love or the will, in that highest and unchangeable essence, which is God, and these three are not the Father, the Son, and the Holy Spirit, but the Father alone.[42]

Presuming Augustine's doctrine of god is inextricably connected to his theological anthropology, it would seem that Paige Hochschild is correct to argue that Augustine places memory "at the heart of what it means to be constituted in the image of God."[43] Clearly, Augustine valued memory. It is as important to him as love and wisdom. But why? What is it about memory that made it so theologically

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[41] Yates, *The Art of Memory*, 46.

[42] Augustine, *On the Trinity: Books 8-15*. ed. Gareth B. Mathews, trans. Stephen McKenna, (Cambridge, UK: Cambridge University Press, 2002), 180.

[43] Hochschild, *Memory in Augustine's Theological Anthropology,* 1.

compelling for Augustine? To address this question we must move away from the well-spun conclusions of *On the Trinity* and into the more rambling ambit of his *Confessions*, the book that Augustine is perhaps best remembered for.

*Confessions* is a literary classic and one man's testimony[44] written directly to God with an intent to uplift us all.[45] Indispensable to this effort is the author's ability to recall people, places, and anecdotes from his own past. His story, he notes, is literally and literarily impossible without the power of his own memory. Indeed, "I could not even recall my own name without it."[46] *Confessions,* in essence, is Augustine remembering himself.

The central theological tenant behind this text is that God is the source of all that is,[47] even the very force driving Augustine's own effort to recall God. Augustine's mind runs introspectively on and on searching for the boundaries of this inner hall.

> Great is the power of memory. It is a true marvel, my god, a profound and infinite multiplicity! And this is the mind, and this I myself am. What, then, am I, my god? Of what nature am I? A life various, and manifold, and exceedingly vast. Look in the numberless halls and caves, in the innumerable fields and dens and caverns of my memory, full without measure of numberless kinds of things...through all these I run and fly to and fro. I penetrate into them on this side and that as far as I can and yet there is nowhere any end.[48]

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[44] Ricoeur creates an interesting, conceptual space for testimony calling it "the fundamental transitional structure between memory and history." *Memory, History, Forgetting,* 21.

[45] *Confessions*, 10.4.6.

[46] *Confessions*, 10.16.25.

[47] *Confessions*, 10.6.9.

[48] *Confessions*, 10.17. 26.

In the same way, his spiritual memoir continuously hunts for appropriate expressions of memory's power and meaning.[49] The unwieldy size, shadowy arrangement, and sheer variety of Augustine's own memory simply astonishes him.[50] He is convinced that his entire life has been filed away in this vast storehouse. He will, therefore, meticulously scour his own archives to select the events that will prove to be spiritually edifying for his audience. Augustine's narrative, disseminated across the first nine chapters, or books, of the *Confessions,* aims to redeem.

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[49] While Augustine did not mention wax, or Plato's aviary metaphor [Thea. 197e], spacial comparisons are replete in Augustine writings. The remembering mind is a "large and boundless inner hall!" Conf. 10.8.14; a "storehouse" Conf. 10.8.12; an enormous land with "innumerable fields and dens and caverns"; a great territory Conf. 10.24.35; a "vast cave" with "numerous and mysterious recesses" Conf. 10.8.13; and even the "belly of the mind" Conf. 10.14.21. For Augustine, the remembering mind is certainly a kind of orderly container.That is, for Augustine, these "fields and spacious halls of memory" exhibit a certain internal organization, "the most wonderful filing system" with "unlimited capacity" Conf. 10.9.16.

[50] Augustine is confident that the mind can treasure up "countless images" Conf. 10.8.12. Particularly because it has so many different points of entry, at least one door for every kind of sense perception. 10. 8.13. Sense perceptions contribute content to the remembering mind's inventory. "For example, light and all colors and forms of bodies came in through the eyes; sounds of all kinds by the ears; all smells by the passages of the nostrils; all flavors by the gate of the mouth; by the sensation of the whole body, there is brought in what is hard or soft, hot or cold, smooth or rough, heavy or light, whether external of internal to the body." 10.8.13. Our malleable minds, according to Augustine, also remember up "what we cogitate" about. The inner halls, in this respect, contain the memories of its own thought processes, how we collated and categorized ideas, perceptions, and sensations. Conf. 10.8.12. For instance, we remember what we have "learned of the liberal sciences" such as "grammar and logic" Conf. 10.9.16. We even create space in our minds for "the principles and the unnumbered laws of numbers and dimensions" 10.12.19 and for recollections of what distinguishes true arguments from false ones. Conf. 10.13. 20. What is more surprising for Augustine is that this "same memory also contains the feelings of my mind; not in the manner in which the mind itself experienced them, but very differently according to a power peculiar to memory." Conf. 10.14. 21. Specific memories even have their own concomitant emotional valence. "I can remember that I once was joyous, and without being sad, I can recall my past sadness. I can remember past fears without fear, and former desires without desire." Conf. 10.14. 21.

The tenth book is less preoccupied with Augustine's testimony in particular. Rather, it considers the ultimate value of memory for humanity in general. First, memory is an indispensable arena for radical self-encounter.[51]

> …this I do within myself, in that huge hall of my memory…I meet myself and recall myself - what, when, or where I did a thing, and how I felt when I did it. There are all the things that I remember, either having experienced them myself or been told about them by others.[52]

To face oneself takes courage. But when a self-encounter occurs, it most likely happens within the halls of memory. For Augustine, such encounters almost always imply conflict, turmoil, writhing, and tears.[53] *Confessions* is replete with agonizing passages of Augustine remembering what he would rather not have to face again. Whether memories of a harsh Greek teacher,[54] an infamous theft from his youth,[55] the brutality he witnessed in the imperial games,[56] or the emotional longings for an old love affair,[57] Augustine is haunted by confrontations with

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[51] *Confessions*, 10.13.20; 10.17.26.

[52] *Confessions*, 10.8.14. This encounter, Augustine goes on to say, can also enliven potential constructive possibilities. "Out of the same storehouse, with these past impressions, I can construct now this, not that, image of things that I either have experienced or have believed on the basis of experience — and from these I can further construct future actions, events, and hopes; and I can meditate on all these things as if they were present." 10.8.14.

[53] *Confessions*, 10.16. 25.

[54] *Confessions*, 1.14.23.

[55] *Confessions*, 2.4.9.

[56] *Confessions*, 6.7.12-6.8.13.

[57] *Confessions,* 6.15.25.

his past. He prays to be “wrenched free” from them “so that [my soul] is no longer in rebellion against itself”[58]. It is God’s command, Augustine claims,

> that I should be continent from ‘the lust of the flesh, and the lust of the eyes, and the pride or life’…But there still exist in my memory - of which I have spoken so much - the images of such things as my habits had fixed there.[59]

And yet, as Augustine’s own conversion to Christianity attests, self-encounter hastens redemption.[60] Thus, however painful, these mnemonic hauntings are necessary. Augustine remembers the dramatic spiritual writhing and reeling he experienced just before becoming “another man”.[61] It happened that he and his faithful sidekick, Alypius, were visited by a fellow African named Ponticianus.[62] During their time together, the guest told them stories about men “inwardly changed” and “suddenly overwhelmed with a holy love and a sober shame”.[63] His stories were no light prompt for Augustine. While Ponticianus was speaking,

> you, lord, turned me toward myself, taking me from behind my back, where I had put myself while unwilling to exercise self-scrutiny. And now you set me face to face with myself, so that I might see how ugly I was, and how crooked and sordid, bespotted and ulcerous. And I looked and I loathed myself; but where to fly from myself I could not discover. And if I sought to turn my gaze away from myself, he would continue his narrative, and you would oppose me to myself and thrust me before my own eyes so

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[58] *Confessions*, 10.30.42.

[59] *Confessions*, 10.30.41.

[60] *Confessions*, 8.819-8.12.29.

[61] *Confessions*, 8.11.25.

[62] *Confessions*, 8.6.14.

[63] *Confessions*, 8.6.15.

> that I might discover my iniquity and hate it. I had known it, but acted as though I knew it not - I winked at it and forgot it.[64]

The encounter drags on as Augustine vehemently quarrels within himself. He escapes “into the garden” to avoid the sickening self-scrutiny.[65] Augustine bitterly reproaches himself “rolling and writhing in my chain till it should be utterly broken.”[66] Not until the torment graciously subsides does Augustine once again sink into “the secret depths” of his soul. Faced with all of the ugliness of his own past, a “mighty storm” bursts forth “accompanied by a mighty rain of tears”.[67] Augustine is broken open, “something like the light of full certainty”[68] falls upon him. Ever after, Augustine recalls this as the very moment he became a different person.

Memory clearly played a decisive role in Augustine’s religious conversion. Idiosyncratic as this inner power must be to spur on each and every spiritual adventure, the bishop also reveres memory for its capacity to join us to one another. He would agree with his interpreter Karmen MacKendrick in this regard.

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[64] *Confessions*, 8.7.16.

[65] *Confessions*, 8.8.19.

[66] *Confessions*, 8.11.25.

[67] *Confessions,* 8.12.28.

[68] *Confessions*, 8.12.29. To treat one’s own memories as a trustworthy source of knowledge is not self-evident in Augustine’s writings. With respect to the memorization of scripture, for instance, he points out in *On Christian Doctrine* that “a man speaks with more or less wisdom just as he has made more or less progress in the knowledge of the Scriptures; I do not mean by reading them much and committing them to memory, but by understanding them aright and carefully searching into their meaning. For there are those who…read to remember the words, but are careless about knowing the meaning.” Like the events recounted in his autobiography, he knows that it one thing to “repeat the words,” and another thing to be able “at the same time [to] correctly apprehend their meaning.” IV. 5. 7. *Great books of the Western World*. ed. Robert Maynard Hutchins. *Augustine*. Vol 18. *On Christian Doctrine*, trans. J.F. Shaw, (Chicago, IL, William Benton, 1952), 677.

"Memory is not simply my own, it needs inter-locution, speaking with, in order to be re-called."[69] Augustine understood that our most intimate relationships are predicated on shared memories. "For you have granted to man that he should come to self-knowledge through the knowledge of others, and that he should believe in many things about himself on the authority of the womenfolk.…Is any man skillful enough to have fashioned himself?"[70] With obvious fondness, Augustine recalls a time in his life when "[w]hat revived and refreshed me, more than anything else, was the consolation of other friends".[71] Conversing with one another, he and his friends were quick to

> talk and tell jokes; to indulge in courteous exchanges; to read pleasant books together; to be playful together; to differ at times without ill-humour, as one might with oneself, and even through these infrequent dissensions to find zest in our more frequent agreements; sometimes teaching, some times being taught; longing for someone absent with impatience and welcoming the homecomer with joy. These and similar tokens of friendship, which spring spontaneously from the hearts of those who love and are loved in return - in countenance, tongue, eyes, and a thousand ingratiating gestures - were all so much fuel to melt our souls together, and out of the many made us one.[72]

These are sweet memories indeed. However, as an older man looking back on his youth, Augustine longs for an even deeper connection with others. Refracted through the nostalgic glow of his youthful relationships, Augustine seeks the sa-

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[69] MacKendrick, Karmen, *Fragmentation and Memory: Meditations on Christian Doctrine.* (New York: Fordham University Press, 2008), 26.

[70] *Confessions*, 1.6.10.

[71] *Confessions*, 4.8.13.

[72] *Confessions*, 4.8.13.

cred bonds of like-minded souls.[73] Through others, we learn about ourselves and remember one another. This, the bishop claims, is a sure foundation for Christian fellowship. Hochschild expresses Augustine's organizing vision perfectly when she refers to the "social memory of the Church".

> [Augustine's] conviction that God not only rescued him in his youth, but even now will not allow him to come to harm, buoys him and enables the present confession to occur. God's mercy, according to his mode of being, extends more deeply and widely than sin. This is the hope shared specifically by those readers who claim membership in the Church. As such, this confession both presupposes and nourishes a community of charity, a *civitas Dei* that can truly sympathize with and be led by Augustine's example. The social memory of the Church is ordered not toward past deeds alone, but to the active recollection of a merciful and steadfast God.[74]

Augustine revers memory, then, as a sacred place and practice. In it, we might be reconciled to ourself and, through it, we may holy cohere to (if not, wholly hear again) one another. What encompasses all of this — and at the foundation of Augustine's ecclesiology — is the belief that memory enables each of us to journey nearer to God.

Augustine's desire to confront himself, and to join with others, achieves its fullest coherence within his ultimate desire to find God. In book ten, Augustine's spiritual pilgrimage intensifies claiming that God resides within the vast reaches

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[73] "Many in my band of friends, consulting about and abhorring the turbulent vexations of human life, had often considered and were now almost determined to undertake a peaceful life, away from the crowds. This we thought could be obtained by bringing together what we severally owned and making of it a common household, so that in the sincerity of our friendship nothing should belong more to one than to the other; but all were to have one purse and the whole was to belong to each and to all." *Conf.* 6.14.24.

[74] Hochschild, *Memory in Augustine's Theological Anthropology*, 143.

of his memory. The inward journey to find himself, therefore, like an Escher print, immediately shifts becoming his ascent toward God.

> What is it, then, that I love when I love my god? Who is he that is beyond the topmost point of my soul? Yet by this very soul will I mount up to him. I will soar beyond that power of mine by which I am united to the body, and by which the whole structure of it is filled with life. Yet it is not by that power that I find my god…I will soar, then, beyond this power of my nature also, still rising by degrees toward him who made me. And I enter the fields and spacious halls of memory[75].

Truly, God honors our memory by residing there. But the bishop has specific questions: "But where in my memory do you abide, lord?…What sort of lodging have you made for yourself there? What kind of sanctuary have your built for yourself?"[76] Augustine's queries go unanswered. The search must continue indefinitely. It appears that the journey, whether by design or by sacred caprice, will only ever be fitfully satisfying. After all, Christians and their god are destined to play a grand game of hide-and-seek.

> For in calling you to mind, I soared beyond those parts of memory which the beasts also possess…From there I went on to those parts where I had stored the remembered affections of my mind, and I did not find you there. And I entered into the inmost seat of my mind, which is in my memory, since the mind remembers itself also - and you were not there.[77]

We proceed into the shadowy depths of ourselves so as to ascend toward the divine light of God. "For you are the lord god of the mind and of all things that are mutable; but you abide immutable over all. Yet you have elected to dwell in my

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[75] *Confessions*, 10.7.11-10.8.12.

[76] *Confessions*, 10.25.36.

[77] *Confessions*, 10.25.36.

memory from the time I learned of you."[78] A circuitous path, to be sure, but this is the ordeal of Christian discipleship that *Confessions* testifies to. And memory is at at the very center of it all. For Augustine, memory has the power to sunder the self and to draw us closer to one another, all for the glory of God. In *Confessions,* memory is everything - hero,[79] foil,[80] and precise vehicle we need to commune with the one god that is the source of all there is.[81]

Augustine's reverence for memory is exceptional. His sense of memory as an indispensable bridge, not only as it connects humans with themselves and with each others, but also to god remains a highpoint within Christian philosophical theology. In this way, Augustine's exploratory account of memory serves as an exemplary testimony to the radical extension of mnemonic themes and dynamics as they emerge according to the impasse of the presence of an absent

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[78] Ibid.

[79] *Confessions*, 2.7.15; 7.17.23.

[80] *Confessions*, 8.7.16.

[81] In the estimation of Pamela Bright, book ten of the *Confessions* can be divided into three key sections to form a "triptych" in which two side panels - the heroic God-seeking self 10.6-10.19 and its opponent, the wounded self 10.28-10.43 - dialectically draw Augustine through the ordeals of life toward the goal of Christian happiness 10.20-10.27. Bright, Pamela, "Book Ten: The Self Seeking the God Who Creates and Heals," in *A Reader's Companion to Augustine's Confessions* eds. Kim Paffenroth and Robert P. Kennedy (Louisville: Westminster John Knox Press, 2003) Brian Stock also found book ten to be organized in a tripartite structure: 10.8-10.17; 10.18-10.25; and 10.25-10.43. See *Augustine the Reader: Meditation, Self-knowledge, and the Ethics of Interpretation.* (Cambridge: Harvard University Press, 1996)

thing.[82] However, his reverence for memory has noticeable problems. First, Augustine is over reliant on an introspective methodology and, second, his religious appreciation of memory is only coherent to the extent that it is bound to the Trinitarianism he espouses. In the next section, we can begin to redress the first problem by attending to more recent engagements with memory from other intellectual disciplines. The social sciences in particular have tried to understand how and why memory dynamics and themes are relevant to a variety of social contexts. Our attempt to redress an Augustinian introspectionism within memory philosophy will need to identify different kinds of memory traces in order to consider how memory - most clearly and frequently appreciated as an individual experience - can have extensive social, perhaps even religious, significance. This latter effort will be taken up in the third section when I suggest that individual and collective memories can enjoy fruitful religious resonances in a theological framework other than the one Augustine forwarded.

### *II. Tracing the Presences of Absence*

> *…in a similar way we say that there are no human tracks in the sand if we cannot find any impressions shaped like a human foot, though perhaps there may be many unevennesses made by human feet, which can therefore in another sense be called human tracks.*[83]

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[82] This tradition, however, includes another remarkable philosophical theologian, Giordano Bruno. The Nolan philosopher has never enjoyed the same fame as Augustine. However, Bruno's engagement with memory is no less exceptional. Deemed a heretic and burned at the stake for his apostasy, Bruno's writings on memory are radical in ways that run contrary to Augustine's perspective. Of great relevance to my interest in the theological relevances of mnemonic phenomena, Bruno endeavored, provocatively, to fully naturalize memory's whence without forgetting to revere its sacred powers and theological importance. Thus, Bruno, I will have to demonstrate in another publication, should be considered a patron saint for religious naturalists.

[83] Rene Descartes quoted in Sutton, *Philosophy and Memory Traces,* 356-57.

Memories, it must always be remembered, are partial at best. Whatever has happened, whatever ordeal has been undergone already, leaves only a remnant of itself behind. Ubiquitous, influential, contestable, fragile, uneven, mnemonic tracks and traces have tantalized memory philosophy for generations. Unlike in the previous section, consideration of the phenomenon of the presence and an absent thing suggests an inquiry which runs in the opposite direction. Our focus here will be on perspectives that have attended to what remains after an original experience is over and done with. The driving motivation of this section is not to revivify an absent source, but rather to critically understand a present trace. “At this instant, as I remember something far distant, what is it precisely that is present to me?”[84]

Working to precisely understand the presences of a far distant memory is a contemporary concern with an extensive history.[85] To appreciate the complexity of the problematic, one only need consider the way we use the operative term itself.[86] A *trace* can be a mark “made by the passage of any person or thing”; or it may be the “vestiges or marks remaining and indicating the former presence, existence, or action of something.” Traces are either “a quantity so minute as to be inferred but not actually measured” or the very attempt “to follow” or “pursue”

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[84] Krell, David Farrell, *On Memory, Reminiscence, and Writing,* 3.

[85] *Memory: Histories, Theories, Debates.* eds. Susannah Radstone and Bill Schwarz.(New York: Fordham University Press, 2010); *Theories of Memory: A Reader*. eds. Michael Rossington and Anne Whitehead; contributing eds. Linda Anderson, Kate Chedgzoy, Pablo Mukherjee, and Jennifer Richards. (Baltimore, MD: Johns Hopkins University Press, 2007)

[86] The following quotes related to the various meanings of the word ‘trace’ come from the *OED Online*, Oxford University Press.

something or someone. A trace is also “a request for information to be sought concerning a particular person or thing.” When we are tracing something, it can mean we are trying to “discover, find out, or ascertain by investigation” perhaps in a “step by step” manner. The act of tracing also suggests that we have taken a particular path or route. Or, maybe we have made a “copy,” or at least have “drawn an outline *of*,” something. Thus, a section dedicated to illuminating the way memories have presented themselves, or the ways memories have been represented, is nothing short of an attempt to trace a multitude of trace mnemonic traces.

Given the linguistic range of the term, one is wise to follow Paul Ricoeur’s reference to the “three major uses of the word ‘trace.’”[87] The first use, introduced in the preceding section if not explicitly named, is identified by Ricoeur as an “affection-impression ‘in the soul’.”[88] With this use of the word, the philosopher endeavors to draw out the intimate, emotional valences associated with remembering. This sort of trace is “the impression as an affection resulting from the shock of an event that can be said to be striking, marking. This impression is essentially undergone, experienced.”[89] Such traces are familiar to us and name much of what filled the pages of Augustine’s *Confessions*. Traces of our past experiences linger in the mind for years and these personal impressions, with all their perceptual texture and private meaning, are not easy to convey fully. The block of wax

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[87] Ricoeur, *Memory, History, Forgetting*, 13.

[88] Ibid., 15.

[89] Ibid., 14.

metaphor is limited in its ability to completely absorb and adequately represent the total gravity implied by this use of the word trace. For Ricoeur, an affection-impression in the soul is best approached as a portal through which to view the broader experiential dynamics beneath memory and recollection. Most of what it means and feels like to have a memory or to achieve a recollection is hidden, highly subjective. In publicly remembering himself, Augustine sought to expose something of this inner landscape. His exemplary, confessional voice has inspired echoes ever since.[90] In this way, Ricoeur identifies an Augustinian innovation, namely, the inspiration for a "tradition of inwardness"[91] within the philosophy of memory primarily built on presentations of affection-impressions.

According to Ricoeur, the inwardness tradition has three features and each one sheds needed light on the first use of the word trace. First, affection-impressions in the soul are considered to be the property of one individual. Accordingly, "memories of one person cannot be transferred into the memory of another. As mine, memory is a model of mineness, of private possession, for all the experiences of the subject."[92] This assumption was largely unquestioned by philosophers of memory until Maurice Halbwachs wrote an influential monograph

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[90] J.M. Coetzee, "Confession and Double Thoughts: Tolstoy, Rousseau, Dostoevsky," *Comparative Literature* 37, no. 3 (1985): 193-232.

[91] Ricoeur, *Memory, History, Forgetting*, 96-120. Ricoeur wants to look closely at this tradition, its identifiable structure and historical lineage, so as to open the possibly for thinking about the 'who' of remembering in collective rather than individualistic terms.

[92] Ibid., 96.

on collective memory in 1925.[93] We will return to his work later in the chapter. A second feature of inwardness is memory's presumed association with the passage of time. For Ricouer, this relationship can be appreciated in two ways. Memory traces and time overlap as one looks "from the past to the future, by a push from behind, so to speak, following the arrow of time of change, but also from the future toward the past, following the inverse movement of transit from expectation toward memory, across the present."[94] As was noted above, Aristotle explicitly recognized the relationship between memory and time; he claimed that "memory is of the past."[95] Recently, however, philosophers argue that the temporal relevance of memory is much more fluid and even broader in scope. Both backward and forward looking mnemonic temporalities have been proposed in recent years and will be discussed at length in subsequent chapters. This particular feature of the tradition of inwardness is certainly compelling given that traces and time are also said to rely on a third aspect of interiority, consciousness. "Through this feature, memory assures the temporal continuity of the person" allowing "me to move back without interruption from the living present to the most

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[93] Halbwachs, Maurice, *On Collective Memory.* ed., trans., and intro. by Lewis A. Coser, (Chicago, IL: University of Chicago Press, 1992) Halbwachs, a student of Emile Durkheim and influenced by Henri Bergson, was determined, according to one of his translators, "to demolish Bergson's stress on subjective time and individualistic consciousness" through his "sociological study of memory". Coser, in his introduction, summarizes Halbwachs's view of 'collective memory' this way. "Collective memory, Halbwachs shows, is not a given but rather a socially constructed notion….It follows that there are as many collective memories as there are groups and institutions in society." 22.

[94] Ricoeur, *Memory, History, Forgetting*, 97.

[95] *On Memory and Recollection*, 449b 15.

distant events of my childhood."[96] We often take such personal continuity for granted and reflexively retrieve affective, vibrant memories from decades ago without ever pausing to question or revere such extraordinary subjective leaps and bridges. Augustine, it seems, paused long enough to have at least anticipated modernity's preoccupation with an 'homunculus' who, among other duties, works to meaningfully re/connect our stochastic memories. But in Ricoeur's estimation Augustine did not fully equate "identity, self, and memory."[97] This complex interplay, formatively demarcating one's sense of personhood, was not explicitly outlined until the eighteenth century by John Locke.[98] In this trinity, conscious awareness draws upon memory to provide an individual self with the sense of having a continuous identity through time.[99] The three features of inwardness converge in this way and help us understand how the integration of memory traces can promote our developing subjectivities. Which is to say that while our affective-impressions are often "divided and organized into levels of meaning, into archipelagoes, sometimes separated by gulfs," there still "remains that capacity to traverse, to move back through time, without anything, in principle, preventing the pursuit of this movement, without any end to its continuity."[100] What

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[96] Ibid., 96.

[97] Ibid., 97.

[98] Locke, John, *An Essay Concerning Human Understanding* abridged and ed, with intro by Kenneth P. Winkler, (Indianapolis, IN: Hackett Publishing, 1996)

[99] Ibid., 133-150. In the next chapter, the amnesic case studies of K.C., D.B., and M.L. lend contemporary scientific credence to Locke's trinity.

[100] Ibid., 96.

can be lauded about Augustine's *Confessions,* then, is his dramatic presentation of self-continuity which effectively utilizes a narrative structure[101] to reveal and conjoin otherwise disconnected islands of personal mnemonic traces for religiously transformative purposes.

Apart from affection-impressions in the soul, Ricoeur accounts for two other uses of the word trace. A second one is as new as the first one is ancient.[102] Ricoeur notes that the word trace is also used to identify those "corporeal, cerebral, cortical" imprints or marks in the brain as "discussed by neuroscience."[103] Unlike the traces described above, neurological memory traces have not only emerged recently, but are also beyond the powers of introspection. Coming to understand these traces occurs through various scientific analyses - from psychological experimentation to functional neuroimaging. Typically, neuroscientific renditions of the memory trace circulate within disciplines far beyond the interest and purview of philosophy. But, as we will see, not all philosophers overlook the science of memory. While Ricoeur does not expound upon his own understanding of cerebral traces,[104] the current project will. In fact, Chapters 2 and 3 attempt to illustrate how the cognitive neurosciences of memory have come to appreciate

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[101] Ibid., 97.

[102] For two very different accounts of the history of this use of the word trace see Bronislaw R. Gomulicki, *The Development and Present Status of the Trace Theory of Memory*. (Cambridge: Cambridge University Press, 1953) and John Sutton, *Philosophy and Memory Traces: Descartes to Connectionism*.

[103] Ricouer, p. 15.

[104] In a footnote, Ricouer registers, without extensive elaboration, this non-compete clause: "We must forcefully affirm that nothing is retracted regarding the best-established teachings of the neurosciences by this exploration of the affective trace," *Memory, History, Forgetting*, 428.

and represent mnemonic traces, or engrams, at various levels of analysis. Without getting ahead of ourselves, two points about these sorts of traces are necessary to emphasize here. First, corporeal, cerebral, or cortical traces, entwined as they are with deep-seated neuroanatomical events and processes, can be properly viewed as extensions of Aristotle's insight that memory and recollection are fundamentally embodied activities. Second, these traces, largely confined and somehow held deep within the cranium, can be appreciated as a contemporary feature of mnemonic inwardness.[105] In the following two chapters, we will trace a scientific inquiry of these cerebral traces, or engrams, as both objectively studied through experimental analysis and subjectively experienced in personal episodic memory.

The third use of the word trace, according to Ricoeur, is decidedly outward in orientation. Ricoeur refers to those "traces on which historians work: these are traces that are written and eventually archived."[106] Traces of the this sort have numerous material supports ranging from texts, archives, artifacts, statues, and architecture to ritual practices, social locutions, and everyday gestures. If affection-impressions in the soul are essentially marked by inwardness - indicated by the three features of interiority - then Ricouer's third use of the word trace names "a diverse and shifting collection of material artifacts and social practices."[107] The

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[105] Steven Rose, "Memories are Made of This," in *Memory: Histories, Theories, Debates,* 198-208.

[106] Ricoeur, *Memory, History, Forgetting*, 13

[107] Kerwin Lee Klein, "On the Emergence of *Memory* in Historical Discourse," *Representations* 69 (2000): 127-150.

material presences of memory can be, and indeed have been, found everywhere.[108] So much so that, for at least the past three decades, these remnants have become one of the most vital and hotly contested areas of inquiry for those who study the subject.[109] Current interest in mnemonic materiality "runs through contemporary public life at high voltage,"[110] without care for boundaries — geographic, ethnographic, nationalistic, academic, or otherwise. While an adequate historical account of this recent explosion of interest exceeds the limited scope of this chapter, I think it is important here to briefly address a key reason behind its dissemination across so many different contexts.

As Ricoeur's appreciation of the different uses of the *word* trace underscores, contemporary preoccupations with memory traces of the historical, material sort have greatly benefited from a "dramatic change in linguistic practice."[111]

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[108] To cite but one instance, Svetlana Boym's *The Future of Nostalgia*. New York: Basic Books, 2001, is a fascinating analysis of memory and/as nostalgia through the material and cultural vestiges that haunt post-communist cities from Berlin, to Moscow, to St. Petersburg. While Boym often engages with architecture and cultural memes, Klein makes it clear that scholars are willing to look at even the most humble of artifacts. He writes: "Ideally, the memory will be a dramatically imperfect piece of material culture, and such fragments are best if imbued with pathos. Such memorial tropes have emerged as one of the common features of our new cultural history where in monograph after monograph, readers confront the abject object: photographs are torn, mementos faded, toys broken." "On the Emergence of *Memory* in Historical Discourse," p. 136.

[109] The veritable explosion in memory studies centering around public displays of memory - linguistic, ritual, architectural, or otherwise - is filling new volumes every year. This section, therefore, is highly condensed and limited to but a small sliver of this rich material. For manageable, interdisciplinary slices of the recent themes and persistent controversies including the study of material memory traces see *Memory: Histories, Theories, Debates* pp. 235-457. and *The Memory Process: Neuroscientific and Humanistic Perspectives*. pp. 335-415. The former collection of essays is geared toward disciplines related to the humanities while the latter also takes great interest in connecting the humanities to neuroscience.

[110] Susannah Radstone and Bill Schwarz, "Introduction: Mapping Memory," in *Memory: Histories, Theories, Debates,* 1.

[111] Klein, "On the Emergence of *Memory* in Historical Discourse," 127.

According to Kerwin Lee Klein, today's "memory industry,"[112] indicative of a "new memorial consciousness,"[113] has been constructed on "both very new and very old"[114] rhetorical uses of the word memory. The current rhetoric, he argues, attempts to synthesize "memory's traditional, essentialist connotations with explicit appeals to postmodern vocabularies."[115]

The academic fervor for all things mnemonic, according to Klein's analysis, began in the 1980s with two noteworthy "literary events": the publication of Yosef Yerushalmi's *Zakhor: Jewish History and Jewish Memory* and Pierre Nora's "Between Memory and History."[116] These two texts are noteworthy because of the way memory, as a key word within academic discourse, was being reinstated "as a primitive or sacred form opposed to modern historical consciousness," and, for Nora in particular, as an "archaic mode of being that had been devastated by ra-

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[112] His important article opens with these lines: "Welcome to the memory industry. In the grand scheme of things, the memory industry ranges from the museum trade to the legal battles over repressed memory and on to the market for academic books and articles that invoke *memory* as a key word." Ibid., 127.

[113] Ibid., 134.

[114] Ibid., 129.

[115] Ibid., 134. This synthesis is well formulated by David Farrell Krell in *On Memory, Reminiscence, and Writing.* With respect to written, archival traces, Krell's work plays with traces and the way he finds them shimmering through various philosophical texts on memory. Operating in a deconstructive mode, Krell revels in a hide-and-seek hermeneutics whereby his mnemonic triumvirate - typography, iconography, engrammatology - endeavors to smoke out many meanings of the memory traces he locates in, through, over, and around writings from Plato to Derrida.

[116] Yosef Hayim Yerushalmi, *Zakhor: Jewish History and Jewish Memory*. foreword by Harold Bloom. (Seattle, WA: University of Washington Press, 1996), Pierre Nora, "Between Memory and History: *Les Lieux de Memoire*," *Representations*, 26 (1989): 7-24.

tionalization".[117] For Klein, then, these works effectively encouraged subsequent scholars to begin to use the word *memory* instead of *history*, fundamentally upsetting and reshaping the conceptual boundaries between the two terms.[118]

There are several reasons why scholars might favor such a terminological swap. For starters, Klein admits that he and other authors may use "memory as a synonym for history to soften our prose, to humanize it, and to make it more accessible. Memory simply sounds less distant, and perhaps for that reason, it often serves to help draw general readers into a sense of the relevance of history for their own lives."[119] This relatively innocent, stylistic, or tonal shift of vocabulary

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[117] Klein, "On the Emergence of *Memory* in Historical Discourse," 127. "Where history is concerned, memory increasingly functions as antonym rather than synonym; contrary rather than complement and replacement rather than supplement." Ibid., 129. Consider Pierre Nora's extended comparison of the two terms. "Memory and history, for from being synonymous, appear now to be in fundamental opposition. Memory is life, borne by living societies founded in its name. It remains in permanent evolution, open to the dialectic of remembering and forgetting, unconscious of its successive deformations, vulnerable to manipulation and appropriation, susceptible to being long dormant and periodically revived. History, on the other hand, is the reconstruction, always problematic and incomplete, of what is no longer. Memory is a perpetually actual phenomenon, a bond tying us to the eternal present; history is a representation of the past. Memory, insofar as it is affective and magical, only accommodates those facts that suit it; it nourishes recollections that may be out of focus or telescopic, global or detached, particular or symbolic - responsive to each avenue of conveyance or phenomenal screen, to every censorship or projection. History, because it is an intellectual and secular production, calls for analysis and criticism. Memory installs remembrance within the sacred; history, always prosaic, releases it again. Memory is blind to all be the group it binds - which is to say, as Maurice Halbwachs has said, that there are as many memories as there are groups, that memory is by nature multiple and yet specific; collective, plural, and yet individual. History, on the other hand, belongs to everyone and to no one, whence its claim to universal authority. Memory takes root in the concrete, in spaces, gestures, images, and objects; history binds itself strictly to temporal continuities, to progressions and to relations between things. Memory is absolute, while history can only conceive the relative." "Between Memory and History," 9.

[118] "History, as with other key words, finds its meanings in large part through its counter-concepts and synonyms, and so the emergence of memory promises to rework history's boundaries. Those borders should attract our interest, for much current historiography pits memory against history even though few authors openly claim to be engaged in building a world in which memory can serve as an alternative to history." Klein, "On the Emergence of *Memory* in Historical Discourse," 128.

[119] Ibid., 129.

amounts to “an old rhetorical practice that has grown infinitely more popular in the last fifteen years.”[120] Using *memory* for *history* is therefore justifiable in certain literary respects.[121] Surely, authors can choose to freely trade on their different connotations. “If history is objective in the coldest, hardest sense of the word, memory is subjective in the warmest, most inviting senses of that word. In contrast with history, memory fairly vibrates with the fullness of Being.”[122] There is, he argues, another reason scholars may use *memory* instead of *history*, namely, the former has a perceived ability to access or otherwise reclaim what has been lost to modernity. To the extent that a given scholar deems the times in which we live as evidently marked by dislocation, or increasing isolation, from the past, the recourse to memory may be appealing because “it projects an immediacy we feel has been lost from history.”[123] History’s places and dates, facts and events often seem irrelevant, too far removed from our current circumstances. Klein argues that using the word memory might actually help to bridge these gaps and even serve “as a critical site for the generation and inflection of affective bonds”. For example, one can consider the unifying effects of such patriotic admonitions as

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[120] Ibid.

[121] “At a time when other such categories - Man, History, Spirit - have lost much of their shine, memory is ideally suited for elevation.” Ibid.

[122] Ibid., 130.

[123] Ibid., 129. For example, in the final chapter of this project we will encounter French sociologist, Daneile Hervieu-Leger, who argues that one mark of modern secularization processes is the way they create or exacerbate temporal and social fragmentations. Religions, generally defined, are able to counter-act these breaks in continuity in certain respects. Far from declining, as secularists assumed they would as a natural consequence of civilization and the advancement of the sciences, religions may actually hold valuable insights for how to reestablish new social bonds in the future. *Religion as a Chain of Memory.* trans. Simon Lee (New Brunswick, NJ: Rutgers University Press, 2000)

'Remember the Alamo' or 9/11's 'Never Forget' or civic invocations like Abraham Lincoln's "chords of memory" whereby the deep bonds among us citizens are said to be "essentially mystic, their notes swelling to the touch of the 'angels or our nature.'"[124] A final reason to use *memory* over *history*, according to Klein, leans on the way memory "invokes a range of theological concepts as well as vague connotations of spirituality and authenticity."[125] He argues that scholars will therefore utilize memory because it "promises auratic returns" as "its traditional association with religious contexts and meanings is so much older and heavier than the comparatively recent efforts of the early professional historians to define memorial practice as a vestigial prehistory."[126] The spiritual, religious, or theological connotations that swirl around the word *memory* are actually what Klein finds most troubling. "Authors writing in secular academic contexts necessarily trade upon these associations, but seldom make them explicit" and "we like to pretend that they have no effect upon our new uses of memory."[127]

The unreflective substitutions of *memory* for *history* are making the current rhetorical syntheses rather uneasy. Replacing terms, in certain cases, is unnecessary. According to Klein, generations of specialists have studied all kinds of "well-known phenomena" such as "oral history, autobiography, and commemorative rituals…without ever pasting them together into something called

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[124] Klein, "On the Emergence of *Memory* in Historical Discourse," 130.

[125] Ibid.

[126] Ibid., 129-130.

[127] Ibid., 130.

*memory*."[128] In its new use, memory functions as a "metahistorical category" subsuming within itself a number of other terms like "folk history or popular history or oral history or public history or even myth".[129] Far from an isolated linguistic practice, Klein fears this kind of semantic overreach is "one of the salient features of our new memory talk". It seems there is a apparent "tendency to make fairly sweeping philosophical claims for memory, or even to imagine memory discourse as part of what is vaguely hailed as the rise of theory in departments of literature, history, and anthropology."[130]

For those who see the need to constrain some of the recent memory talk, critics identity two problematic areas of linguistic or theoretical overreach in particular. Both are firmly invested in the theological or religious resonances adhering to the word memory and are therefore certainly of interest to this project. The first set of problems emerges when scholars use *memory* to broadly refer to both "psychic acts of individuals" *and* a "wide array of physical objects".[131] Used in this way, the linguistic practice attempts to displace memory from its subjective, individual confines and fundamentally situate mnemonic themes and dynamics into things and actions found in the world around us. "The most common strategy for justifying the analogical leap from individual memories to Memory — social, cultural, collective, public, or whatever — is to identify memory as a collection of

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[128] Ibid., 128.

[129] Ibid.

[130] Ibid.

[131] Ibid., 131.

practices or material artifacts."[132] Terminological extensions of this kind, natural to working social scientists and familiar to scholars in other disciplines, were unthinkable until very recently, and actually go well beyond everyday usages of the word memory.[133] While there may be a growing consensus among academics that memory is 'essentially social,' such a notion runs counter to most popular identifications of memory. The inwardness tradition of memory is certainly entrenched in popular imagination.

To argue that memory is not primarily an individual phenomenon, but rather a social process and practice necessitates that memory be exorcised from its exclusive inward residence and completely situated in various external media. Proponents fundamentally externalizing the memory trace argue, therefore, for the existence of an interlocking, trans/formative material structure through which mnemonic themes and dynamics can be efficacious for an individual. The various material traces of memory, these scholars claim, creates an influential, inescapable web of objects and practices. The implication is that individuals always already live in and are fundamentally constructed by this mnemonic web. As one proponent of the structuralist view of memory, Michael Schudson, explains:

> there is no such thing as individual memory…[m]emory is social…it is located in institutions rather than individual human minds in the form of rules, laws, standardized procedures, and records, a whole set of cultural practices through which people recognize a debt to the past (including the notion of 'debt' itself) or through which they express moral continuity with the past (tradition, identity, career, curriculum). These cultural forms store and transmit information that individuals make use of without themselves

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[132] Ibid., 135.

[133] Ibid., 130-131.

> 'memorizing' it. The individual's capacity to make use of the past piggy backs on the social and cultural practices of memory.[134]

According to structuralist models of memory, then, all of us, as individuals, live and move and have our being within a myriad of material traces. These traces have always been re/forming and re/constituting our self-understanding in collective terms. The term *memory* therefore takes on new layers of meaning. It begins "to look like a Foucauldian field of discourse, thoroughly material, empirical, and suitable for historical study."[135] According to Klein's assessment of the meaning of this new materialization of memory

> Individual memory thus becomes Memory and the subject of any number of potential generalizations. Freed from the constraints of individual psychic states, memory becomes a subject in its own right, free to range back and forth across time, and even the most rigorous scholar is free to speak of the memory of events that happened hundreds of years distant or to speak of the memory of an ethnic, religious, or racial group. The prosaic emancipation is tremendous, for an author can move freely from memories as individual psychic events to memories as shared group consciousness to memories as a collection of material artifacts and employ the same psychoanalytic vocabularies throughout.[136]

Objects and architecture, texts and practices have been important for understanding memory and recollection since antiquity, as we will see. This materiality certainly has a place and purpose. If nothing else, the traces upon which historians work remind us that "all remembering occurs within social contexts of en-

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[134] Michael Schudson, "Dynamics of Distortion in Collective Memory," in *Memory Distortion: How Minds, Brains, and Societies Reconstruct the Past*. ed. Daniel L. Schacter, (Cambridge, MA: Harvard University Press, 1995), 346-347.

[135] Klein, "On the Emergence of *Memory* in Historical Discourse," 136.

[136] Ibid.

vironment and discourse."[137] The deeper, critical appraisals they invite, however, require that proponents of the structuralist renderings of memory be as explicit about their proper functions as about their discontinuities with respect to the way each individual brain uniquely processes and recounts life's ordeals. This is Klein's point: mnemonic particularity is being forgotten. For mnemonic structuralists, artifacts themselves are given agency "and we enter a new age in which archives remember and statues forget."[138] Behind every socially potent material trace, it must be remembered, there are individual agents of memory who have done the work to make the objects that endure, there are other agents who have chosen to engage with these objects, and still others who work to pass on those social practices they think should remain. Too often, contemporary critical engagements with memory undermine individual agents and jump to memory's grander historical meaning. This problematic leap can exaggerate the relevance of memory traces across vast stretches of time and over great expanses of space. In this way, the objects and practices of memory - once largely circumscribed in historical significance and collective meaning by specific individuals living within the particular communal life-world - are now thought to obtain a real measure of omniscient omnipresence. For Klein, this omniscient omnipresence trades on a more primitive union which imbues material objects with a "divine

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[137] Radstone and Schwarz, "Introduction: Mapping Memory," in *Memory: Histories, Theories, Debates,* 4.

[138] Klein, "On the Emergence of *Memory* in Historical Discourse," 136.

presence".[139] It is not only surprising that philosophers of memory have been comfortable with these kinds of resonances, but also that they have managed to obscure mnemonic particularity. These problems, however, appear to be the unfortunate side effects of those unreflective attempts to extract social relevance from memory without regard for the differences between individual and collective memory.

The problematic displacement of individual agents of memory occurs whenever scholars unreflectively employ the term 'collective memory'. This creates a second "unsettled area" within contemporary memory scholarship.[140] As indicated above, structural portrayals of memory pave the way for an understanding of mnemonic phenomena as a collection of material artifacts and social practices. The next logical step, then, is for these practices and artifacts to be treated as collective property, the material products of some sort of group mind. Wulf Kansteiner argues that scholars fall into this mistake not having "sufficiently conceptualized collective memories as distinct from individual memory."[141] And it is

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[139] Klein, "On the Emergence of *Memory* in Historical Discourse," 132. In other words: "Again we have an essential continuity of premodern meanings in more accessible, modern terms, and the old, sacred meanings breathe life into our new structural consciousness." Ibid., 134

[140] Kansteiner, Wulf, "Finding Meaning in Memory: A Methodological Critique of Collective Memory Studies," *History and Theory*, 41 (2002): 179-197.

[141] Kansteiner, 185. Klein concurs: "The identification of memory with the psychological self has become so strong that despite the constant invocation of 'public memory' or 'cultural memory' it is difficult to find a sustained scholarly argument for the old-fashioned notion of 'collective memory' as a set of recollections attributable to some overarching group mind that could recall past events in the (admittedly poorly understood) ways in which we believe that individuals recall past events." 135.

not just because collective memory is an elusive phenomenon.[142] The trouble stems from insufficient attempts to clarify the “precise relation” between individual and collective memory. Too often, the one term merely collapses into the other.[143] To be clear, Kansteiner does acknowledge “the social nature of individual remembering and forgetting,” citing recent psychological and neurological studies.[144] For instance, it is generally accepted that we cannot separate the ways we retain, relate, and “reconfigure” experiences “from patterns of perception which we have learned from our immediate and wider social environments.”[145] Additionally, the language we use and the “narrative patterns” we employ “to express memories, even autobiographical memories, are inseparable from the social standards of plausibility and authenticity that they embody.”[146] Thus, in these important respects, Kansteiner can find agreement with Schudson when he argues that ‘there is no such things as individual memory.’

However, Kansteiner goes beyond Schudson’s position to claim that there is still ample reason to clearly differentiate individual and collective memory. Too

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[142] In Kansteiner’s view “Collective memory is not history, though it is sometimes made from similar material. It is a collective phenomenon but it only manifests itself in the actions and statements of individuals. It can take hold of historically and socially remote events but it often privileges the interests of the contemporary. It is as much a result of conscious manipulation as unconscious absorption and it is always mediated. And it can only be observed in round about ways, more through its effects than its characteristics.” 180.

[143] Ibid., 185-190.

[144] Ibid., 185.

[145] Ibid.

[146] Ibid.

often, proponents of collective memory hastily cross the theoretical threshold "without any adjustments in method". Thus, "collectives are said to remember, to forget, and to repress the past" and such problematic positions are apparently forwarded "without any awareness that such language is at best metaphorical and at worst misleading about the phenomenon under study."[147] He explains that just because "individual memory cannot be conceptualized and studied without recourse to its social context," that "does not necessarily imply the reverse, that is, that collective memory can only be imagined and accessed through its manifestations in individuals."[148] He argues that memory philosophers have to avoid a "potentially grave methodological error" in perceiving and conceptualizing "collective memory in terms of the psychological and emotional dynamics of individual remembering."[149] According to Kansteiner, these issues cannot be easily sidestepped. For example, proponents will rush to assert that certain "acts of memorialization," like the design of a museum or national monument, complete with "realized objects" and concomitant "meanings," can be sufficiently understood with references to "its maker's conscious or unconscious objectives."[150] Again, the large methodological divide between the individual and the collective remains unbridged.

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[147] Ibid., 185-186.

[148] Ibid., 185.

[149] Ibid.

[150] Ibid., 186.

Kansteiner offers a few necessary interventions. I will briefly mention them here because they reemerge in greater detail in the final chapter. Without denying the social foundations of individual memory, Kansteiner argues that scholars have to make a distinction between two different types of 'social' memory - one autobiographical, the other collective.[151] This is essential because each type requires its own kind of analysis. For instance, to understand autobiographical memory scholars can draw on any number of disciplines, e.g., neurological, psychological, and psychoanalytical. Understanding the dynamics of collective memory, on the other hand, requires methods appropriate to the particular group/s in question.[152] This practical consideration follows from the revolutionary insights of Halbwachs. He understood that individuals "are always part of several mnemonic communities, and that collective remembering can be explored on very different scales; it takes place in very private settings as well as in the public sphere."[153] Through all of this, Kansteiner explains, scholars of collective memory must admit that their work will necessarily distance them from the unique experiences of actual individual remembers. The particularity of an individual memory -

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[151] Ibid., 185.

[152] Ibid.

[153] Ibid., 189. Kansteiner continues: "On one side of the spectrum we might pursue collective memories of small groups such as families whose members weave a common vision of the family's origin and identity. On the other side, we are beginning to consider supranational collective memories as in the case of the (still dubious) entity, a European collective memory. On any level, however, '[c]ollective memory works by subsuming individual experiences under cultural schemes that make them comprehensible and, therefore, meaningful.'" 189. Kansteiner's lines end with a quote from Barry Schwartz's *Abraham Lincoln and the Forge of National Memory*. (Chicago, IL: University of Chicago Press, 2000), xi.

its singular, embodied intensity - is necessarily sacrificed to garner a wider, collective relevance.

> Methodologically speaking, memories are at their most collective when they transcend the time and space of the events' original occurrence. As such, they take on a powerful life of their own, 'unencumbered' by actual individual memory, and become the basis of all collective remembering as disembodied, omnipresent, low-intensity memory.[154]

Kansteiner's remarks are important. The realization he demands and the distinction he prescribes actually create a twofold pathway forward. By separating mnemonic phenomena into two broad categories - autobiographical and collective - critical analysis can develop firmer methodological footing as it pertains to these different, albeit complexly interconnected tracks.[155] The former category, I suggest, naturally implies a set of *therapeutic* examinations of the individual as the next two chapters intend while the latter invites a set of *political* interrogations of organized groups as the final chapter of this project will gesture toward.[156] My intent it to begin to conjoin these two tracks within one broad religious vision, the kind of integration Augustine so brilliantly managed to forge. However, in contrast to Augustine, my contextualization of memory's religious significance emerges within an entirely immanent and fully natural theological framework. Indispensable to this effort will be Loyal Rue's evolutionary approach to religion. Like other

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[154] Kansteiner, "Finding Meaning in Memory," 189.

[155] Autobiographical memory will be the focus of chapters 2 and 3.

[156] In endeavor to use the term 'therapeutic' in this instance, and throughout the duration of this project, in a way that would include all of the sciences of the mind, both old and new. Similarly, by using the term 'political,' I have in mind the various analyses that can and have drawn social or collective relevances by first closely studying individual mnemonic processes. These terms will emerge again in the final chapter and will be further clarified.

religious naturalists, Rue has tried to work out the implications of evolutionary theory for our understanding of religion. In the final chapter, I will draw from his perspective while paying particular attention to how, where, and why memory fits into, and perhaps modifies, his general and naturalistic theory of religion.

We conclude the present chapter with an indication that the separate, yet related, tracks of inquiry - individual and collective - began to surface in the appraisals of memory from antiquity. Embedded within the very origins of the ancient art of memory, I submit, is a hidden wisdom, namely, a fundamental recognition that any potential collective use of memory emanates through an individual mnemonic artist. After one sufficiently embraces the valuable lessons of this art, a practitioner can begin to effectively save themselves and their communities through memory. This salvific possibility, the ancient proponents of *ars memoria* remind us, is fundamentally motivated by the real specter of forgetting.

### *III. Into Oblivion: Forgetting the Meaning of Memory*

*"There is forgetting wherever there had been a trace."*[157]

Traces, of any kind, are the unforgotten. The remaining parts of a larger whole, they represent whatever has not been lost to oblivion. Even our longest-lasting personal and collective memories, understood in this way, are barely hanging on. Forgetting surrounds every act of memory. How then are we to understand forgetting? Can it relate to memory and recollection productively or does forgetting always play an adversarial role? Once again, Paul Ricoeur will set us off on the right path.

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[157] Ricoeur,, *Memory, History, Forgetting*, 284.

Forgetting, Ricoeur writes, remains a "disturbing threat that lurks in the background" of any appreciation of memory. At bottom, we experience forgetting

> as an attack on the reliability of memory. An attack, a weakness, a lacuna. In this regard memory defines itself…as a struggle against forgetting… And our celebrated duty of memory is proclaimed in the form of an exhortation not to forget.[158]

These exhortations are familiar, understandable. After having undergone a personally painful event, such as sexual violence, or a national tragedy, such as genocide, our initial instinct is often to demand that such episodes be remembered, and never forgotten, so that they will not happen again. Heart-wrenching personal narratives are re/told, devastating collective accounts of suffering are re/inscribed in hopes that we might heal and history won't repeat itself. The demand to "never forget" suggests that what individuals and collectives really value, and desperately yearn for, is a complete and perfect memory. To forget nothing is to remember everything. This, we instinctively claim, is not just our moral and ethical duty, but truly our only hope against an uncertain future. A memory that never forgets, we believe, will certainly save us.

While many firmly believe this, it is necessary to consider that a 'perfect' memory may only bring us more pain, not less. Literary examples are instructive. During the Second World War, Jorge Luis Borges penned a famous story, "Funes, the Memorious," about a boy, Ireneo Funes, who, after falling from a horse, lost consciousness, was nearly crippled, and recovered to the realization that "his

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[158] Ricoeur, *Memory, History, Forgetting*, 413.

perception and his memory were infallible."[159] The story's narrator had a chance to meet Ireneo.

> He told me: *I have more memories in myself alone than all men have had since the world was a world*. And again: *My dreams are like your vigils.* And again, toward dawn: *My memory, sir, is like a garbage disposal*.[160]

Far from a glorious condition, Ireneo's vast memory was insufferable.

> Funes not only remembered every leaf on every tree of every wood, but even every one of the times he had perceived or imagined it. He determined to reduce all of his past experience to some seventy thousand recollections, which he would later define numerically. Two considerations dissuaded him: the thought that the task was interminable and the thought that it was useless. He knew that at the hour of his death he would scarcely have finished classifying even all the memories of his childhood.[161]

Borges writes that Funes, shortly after abandoning this task, died "of a pulmonary congestion."[162]

Borges's tale implies that the man's infallible memory filled him to the brim, blocked out all hope, and overshadowed all of life's humbler purposes. Decades after Borges, another literary giant, Salman Rushdie, created a character similarly endowed, but differently depleted by his exceptional memory. Rushdie's figure was not a South American peasant like Ireneo, but rather an army colonel tasked with preserving Kashmir and thereby the very integrity of his native India. Colonel

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[159] Jorge Luis Borges, "Funes, the Memorious," in *Ficciones.* ed. Anthony Kerrigan, (New York: Grove Press, 1962), 112.

[160] Ibid.

[161] Ibid., 114.

[162] Ibid., 115.

Kachhwaha came to be feared by the locals and his own men. Nevertheless, he "saw himself as a man of the thinking kind." For the colonel

> was famous for possessing an exceptional memory and liked to demonstrate it. He could remember two hundred and seventeen random words in succession and also tell you if asked what the eighty-fourth or one hundred and fifty-ninth word had been, and there were other such tests that impressed the officers' mess and gave him the air of a superior being.[163]

Such an exceptional memory, in any person let alone a military man, Rushdie's tale warns, may eventually emerge as a less than desirable trait.

> His knowledge of military history and the details of famous battles was encyclopedic. He prided himself on his storehouse of information and was pleased with the consequent, irrefutable thrust of his analysis.The problem of the accumulating detritus of quotidian memories had not yet begun to distress him, although it was tiresome to remember every day of one's life, every conversation, every bad dream, every cigarette. There were times when he hoped for forgetfulness as a condemned man hopes for mercy. There were times when he wondered what the long-term effect of so much remembering might be, when he wondered if there might be moral consequences. But he was a soldier. Shaking off such thoughts, he got on with his day.[164]

Rushdie's ominous description of the colonel's mnemonic prowess proved deadly. His 'perfect' memory did have moral consequences. On a contentious geopolitical and religious border, where tit-for-tat is the norm, so much remembering foreshadowed the atrocities to come - violent, retributive military orders predicated on the colonel's meticulous score-keeping. In Rushdie's character, "there was no peace" because war "raged on interminably in his memory".[165]

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[163] Salman Rushdie, *Shalimar the Clown: A Novel*. (New York: Random House, 2005), 96-97.

[164] Ibid., 97.

[165] Ibid., 162.

Certainly, one could cite other powerful illustrations of 'perfect' memory.[166] And yet, what critical effect would they have? Such tales implying or explicitly advocating the need to forget could be dismissed as mere fiction, just a bunch of made up, albeit excellently crafted, stories. There are, however, a number of compelling neurological case studies that are not made up. Solomon Shereshevsky[167] and Jill Price,[168] for instance, are recognized mnemonists. These individuals are famous in neuroscientific circles and beyond for their 'perfect' memories. Like Ireneo Funes and the Colonel Kachhwaha, Price and Shereshevsky experienced their exceptional memories as a terrible burden with negative consequences. They struggled to maintain their jobs,[169] relationships,[170] and sanity.[171]

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[166] On the other hand, Ray Bradbury's classic, *Fahrenheit 451*, ends with "photographic" memory as the redeeming hero in a world antagonistic to books and perpetually fighting a shadowy war with itself. Out in the desolate, dystopian territory between the urban centers, Montag meets Granger and other dissident travelers. Granger explains: "All of us have photographic memories, but spend a lifetime learning how to block off the things that are really in there. Simmons here has worked on it for twenty years and now we've got the method down to where we can recall anything that's been read once." p. 151. Later, Granger gives Montag a sense of the bigger mission to take the future. "We're going to meet a lot of lonely people in the next week and the next month and the next year. And when they ask us what we're doing, you can say, We're remembering. That's where we'll win out in the long run. And someday we'll remember to much that we'll build the biggest goddamn steamshovel in history and dig the biggest grave of all time and shove war in an cover it up." 163-164. *Fahrenheit 451*. (New York: Del Rey, 1996).

[167] Solomon Shereshevky, or S. was a patient extensively studied by A.R. Luria and the subject of Luria's book *The Mind of a Mnemonist: A Little Book about a Vast Memory*. trans. Lynn Solotaroff, foreward by Jerome S. Brunner, (Cambridge, MA: Harvard University Press, 1987).

[168] Jill Price was the recent subject of an intense, comprehensive study Dr. James L. McGaugh and his colleagues at the University of California at Irvine. Price, with help from Bart Davis, recently wrote a memoir entitled *The Woman Who Can't Forget: The Extraordinary Story of Living with the Most Remarkable Memory Known to Science*. (New York: Free Press, 2008).

[169] Luria, *The Mind of a Mnemonist*, 15, 158-159.

[170] Ibid., 159.

[171] Ibid., 149-157 and Price, *The Woman Who Can't Forget,* 3.

Neither one unqualifiedly lauded their mnemonic prowess. Rather, as Price acknowledges,

> as much as I like that my memory is so complete, it's been terribly difficult to live with….One of the most troubling features of my memory is that it is so automatic and can spin wildly out of control. Though I can direct my memory back to particular events I want to remember…when my memory is left to its own devices, it roams through the course of my life at will. Memories are popping into my head randomly all the time, as though there is a screen in my head playing scenes from movies of years of my life that have been spliced into one another, hopping around from day to day, year to year, the good, the bad, the joyful, and the devastating, without my conscious control.[172]

Countless remembered images, dates, events, and feelings constantly flood Price and Shereshevky's minds. What they will never forget threatens to become too much for them to carry.

Considering "the extreme case" of a "man without any power to forget," Friedrich Nietzsche argues that it would be preferable to live like the animals, "unhistorically". "Consider the cattle," Nietzsche writes, "grazing as they pass you by; they do not know what is meant by yesterday or today, they leap about, eat, rest, digest, leap about again, and so from morn till night and from day to day, fettered to the moment and its pleasures or displeasure, and thus neither melancholy nor bored."[173] Unlike the mnemonists among us, forgetful cows are on the true path toward happiness, unburdened by the cumulative weight of their own memories. Here's the bovine wisdom: "it is possible to live almost without memory, and to live happily moreover…but it is altogether impossible to *live* at all with-

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[172] Ibid., 32-33.

[173] Friedrich Nietzsche, "On the Uses and Disadvantages of History for Life," in *Untimely Meditations.* ed. Daniel Breazeale, trans. R.J. Hollingdale, (Cambridge, UK: Cambridge University Press, 1997), 60.

out forgetting."[174] It would seem that individuals "who do not posses the power of forgetting at all," like Price and Shereshevky, are unable to really live. Their trouble, according to Nietzsche's way of thinking, is that, in time, they "would no longer believe in [their] own being, would no longer believe in [themselves], would see everything flowing asunder in moving points and would lose [themselves] in this stream of becoming," and, without a firm sense of who they are, would "hardly dare to raise a finger."[175] Forgetting, he asserts, is "essential to action of any kind". Thus, Nietzsche's simple message to those of us who yearn to never forget is a provocative warning:

> *there is a degree of sleeplessness, of rumination, of the historical sense, which is harmful and ultimately fatal to the living thing, whether this living thing be a man or a people or a culture*.[176]

The lessons of the extreme individual cases of 'perfect' memory, if applied to a people or a group are the same. The difficult ordeals of history would be exponentially compounded if we never forgot any of their details. Total, complete, or perfect remembering amounts to an imperfect, albeit understandable, approach to past hardships and an unwieldy, and ineffective, shield from future anguish. Nietzsche understood this. In another text, Nietzsche spoke of a mnemonist antidote — "active forgetfulness". Its purpose would be "to make room for new things, above all for the nobler functions and functionaries, for regulation, foresight, premeditation". Forgetfulness, he explains, is "like a doorkeeper, a pre-

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[174] Ibid., 62.

[175] Ibid.

[176] Ibid. Italics in the original.

server of psychic order, repose, and etiquette: so that it will be immediately obvious how there could be no happiness, no cheerfulness, no hope, no pride, no present, without forgetfulness."[177] When an individual or a group are filled to the brim with memories, there is little room for novelty, the possibilities for future flourishing are increasingly foreclosed.

Remembering and forgetting, as the extreme ends of a mnemonic continuum, will not work. Remembering everything 'perfectly' is as undesirable, as unhealthy, as total oblivion. Perhaps surprising to some, Nietzsche was nuanced enough to recognize that the mnemonic pendulum must never swing too far in one direction. For the true *"health of an individual, of a people and of a culture*," necessitates that remembering and forgetting occur in *"equal measure*".[178] Nietzsche's wise admonition, however, only gets us so far, according to Yerushalmi.

> But given the need both to remember and to forget, where are the lines to be drawn? Here Nietzsche is of little help to us. How much history do we require? What kind of history? What should we remember, what can we afford to forget, what must we forget?[179]

These questions will, and should, continue to linger in all of our minds. In the very least, when we are convinced of the need for some kind of balance, we receive an inkling of the way forward through the aporia. The skills we will require for this journey are not new - ancient schools of rhetoric were essentially motivated by

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[177] Nietzsche, *On the Genealogy of Morals.* trans. Walter Kaufmann and R.J. Hollingdale, (New York: Vintage Books, 1989), 58.

[178] Nietzsche, "On the Uses and Disadvantages of History for Life," 63. Italics in the original.

[179] Yerushalmi, *Zakhor*, 107.

this same twofold task or knowing what to remember and what to forget. Sadly, many of their lessons have been lost to oblivion.

Francis Yates and Mary Carruthers have helped to resuscitate an important perspective on memory from antiquity. In their extensive studies of the the ancient arts of memory, Yates and Carruthers illustrate the centrality of memory within classical education. Students learning rhetoric, for example, were instructed in memorization techniques to be able to enhance the effect of their public-speaking endeavors.[180] As Carruthers and Yates explain, through these ancient techniques of memorization - which employ various visualization strategies whereby an individual borrows or creates mental images, whether of places or objects, as mnemonically useful stand-ins for that which is to be retrieved during a public speech - lawyers, politicians, or religious leaders were able to plead their cases, at great length, without help from any external or textual aids.[181] In this way, the individual memory ought to be exceptionally honed in order to serve the needs of another. The point of memorization, it seems, was not about becoming an archive of one, but rather to become an accomplished purveyor of the cause

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[180] Yates, "We moderns who have no memories at all may…employ from time to time some private mnemotechnic not of vital importance to us in our lives and professions. But in the ancient world, devoid of printing, without paper for note-taking or on which to type lectures, the trained memory was of vital importance. And the ancient memories were trained by an art which reflected the art and architecture of the ancient world, which could depend on faculties of intense visual memorisation which we have lost." *The Art of Memory*, 4.

[181] Yates, "The first basic fact which the student of history of the classical art of memory must remember is that the art belonged to rhetoric as a technique by which the orator could improve his memory, which would enable him to deliver long speeches from memory with unfailing accuracy. And it was as a part of the art of rhetoric that the art of memory travelled down through the European tradition in which it was never forgotten, or not forgotten until comparatively modern times, that those infallible guides in all human activities, the ancients, had laid down rules and precepts for improving the memory." Ibid., 2.

of another. The art of memory, while a practical necessity in certain professions, was also valued for its social, and often political, relevance.

According to Carruthers and Yates, the ancient memory techniques are a rare combination of practical knowledge and mystical wisdom with definite social benefit. The earliest inspiration for the memory arts, and its founding myth, is the story of Simonides of Ceos. One particular event from his life was circulated through several different textual sources. And each source understood Simonides's personal experience as the original prompt and primary justification for why students ought to learn the mnemonic arts.[182]

> At a banquet given by a nobleman of Thessaly named Scopas, the poet Simonides of Ceos chanted a lyric poem in honor of his host but including a passage in praise of Castor and Pollux. Scoops meanly told the poet that he would only pay him half the sum agreed upon for the panegyric and that he must obtain the balance from the twin gods to whom he had devoted half the poem. A little later, a message was brought to Simonides that two young men were waiting outside who wished to see him. He rose from the banquet and went out but could find no one. During his absence the roof of the banqueting hall fell in, crushing Scopas and all the guests to death beneath the ruins; the corpses were so mangled that the relatives who came to take them away for burial were unable to identify them. But Simonides remembered the places at which they had been sitting at the table and was therefore able to indicate to the relatives which were their

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[182] Yates traces the art of memory tradition through three major Latin sources: the *Ad Herennium,* written anonymously 86-82 BCE; Cicero's *De oratore*; and Quintilian's *Institutio oratoria.* Of the latter former, she writes: "An immense weight of history presses on the memory section of *Ad Herennium*. It is drawing on Greek sources of memory teaching, probably in Greek treatises on rhetoric all of which are lost. It is the only Latin treatise on the subject to be preserved, for Cicero's and Quintilian's remarks are not full treatises and assume that the reader is already familiar with the artificial memory and its terminology. It is thus really the main source, and indeed the only complete source, for the classical art of memory both in the Greek and in the Latin world. Its role as the transmitter of the classical art to the Middle Ages and the Renaissance is also of unique importance. The *Ad Herennium* was a well known and much used text in the Middle Ages when it had an immense prestige because it was thought to be by Cicero. …In short…all attempts such as we are making in this book to puzzle out the history of that art in the Western tradition must refer back constantly to this text as the main source of the tradition." Yates, *The Art of Memory*, 5-6.

> dead. The invisible callers, Castor and Pollux, had handsomely paid for their share in the panegyric by drawing Simonides away from the banquet just before the crash. And this experience suggested to the poet the principles of the art of memory of which he is said to have been the inventor. Noting that it was through his memory of the places at which the guests had been sitting that he had been able to identify the bodies, he realised that orderly arrangement is essential for good memory.[183]

The story of Simonides teaches us a great deal. Many centuries removed from the height of its popularity, the tale harbors a wisdom that goes well beyond its rather simplistic, didactic closing lines. The legend of Simonides is not just about being inspired to study his 'mnemotechnics'[184] or about merely affirming the connection he drew between 'orderly arrangement' and 'good memory'. It betrays a deeper understanding of the sacred benefits, duties, and consequences aligned with remembering and forgetting. The tales's admonitions and meanings are layered - the heroic rememberer neither forgets the gods, nor his fellow guests at the banquet. Simonides's exceptional memory does not just entertain his audience - the poetic rememberer also honors his mnemonic gift by recording all the names and faces of those who came, and even invoking those who did not. Because Simonides remembered the gathered - each one had an exact place at the banquet - the lost could be found, named, accounted for, and properly mourned. Memory, well honed by one poet, served to save many from oblivion. And the one mnemonic poet, it must also be remembered, was saved in turn, payment enough for not forgetting his divine benefactors.

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[183] Yates, *The Art of Memory*, 1-2. The story of Simonides is recounted by Cicero in *De Oratore*, according to Yates, Ibid.

[184] Yates, "The word 'mnemotechnics', though not actually wrong as a description of the classical art of memory, makes this very mysterious subject seem simpler than it is." Ibid., 4.

The inherent complexities of memory discussed in this chapter - the phenomenon of the presence of an absent thing, tracing a multitude of trace mnemonic traces, and the relation between remembering and forgetting - will continue to prompt investigation and invite invocation. In subsequent chapters, we will chart an Aristotelian path into the neurophysiological depths of mnemonic phenomena. We will be particularly interested in the neurological traces of memory, in the form of episodic memories, that can both shore up and disrupt self-understanding and social cohesion. The engrams residing in our minds, we must never forget, are made possible by the brains we have as evolved human animals. This, at least, is the scientific narrative we must endeavor tell in the two chapters to follow.

## *Chapter 2*
## *Memory's Natural Width: Timely Lessons from the Neuropsychology of Episodic Remembering and its Loss*

> *…when you are nine years old, what you remember seems forever; for you remember everything and everything is important and stands big and full and fills up Time and is so solid that you can walk around and around it like a tree and look at it. You are aware that time passes, that there is a movement in time, but that is not what Time is. Time is not a movement, a flowing, a wind then, but it is, rather, a kind of climate in which things are, and when a thing happens it begins to live and keeps on living and stands solid in Time like the tree that you can walk around. And if there is a movement, the movement is not Time itself, any more than a breeze is climate, and all the breeze does is to shake a little the leaves on the tree which is alive and solid.*[185]

Theological and philosophical engagements with memory, as we have seen, are almost always preoccupied with what contemporary scientists of memory call *episodic* memory, even when the mnemonic phenomena in question do not travel under that precise heading.[186] "Episodic memory is memory for our unique past experiences that unfolded in a particular time and place," and this "collection of our personal experiences...still resides inside of us and makes up much of the narrative of our lives."[187] With few exceptions, however, philoso-

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[185] Warren, Robert Penn, "Blackberry Winter," in *The Granta Book of the American Short Story.* ed. Richard Ford, (London: Granta Books, 1993)

[186] For instance, in David Farrell Krell's *On Memory, Reminiscence, and Writing: On the Verge*, he writes in his introduction that "[this book] reduces the sense of memory to what contemporary psychology and neurophysiology call 'long-term memory,' that is, retention of persons, objects, or events from the distant past." 2.

[187] Davachi and Danker, "Cognitive Neuroscience of Episodic Memory," in *The Oxford Handbook of Cognitive Neuroscience.* eds. Kevin N. Ochsner, Stephen M. Kosslyn, (New York: Oxford University Press, 2014), 375-388.

phers and theologians rarely deem it necessary to treat episodic memory - this highly individualized collection of formative experiences - as a unique axiological product of nature with a compelling evolutionary history and religious relevance. Such an endeavor will be the goal of the next three chapters.

The approach to episodic memory taken here was suggested decades ago by Mary Warnock. In her brilliantly concise philosophical treatise on memory, Warnock wondered: "Why do we value memory so highly? What is its role, not so much in our humdrum practical lives, where it is plain that we could not survive without it, as in the life of the imagination, in art and, above all, in our own self-esteem?"[188] Her study took up these questions with respect to autobiographical memory in particular. "After all, one of the most familiar, and, as we shall see, most highly valued kinds of memory, certainly 'conscious' and not a matter of habit only, is the way in which we remember places or people when we are absent from them."[189] While Warnock neither explored the neurological foundations nor the evolutionary history behind our ability to encode, consolidate, and retrieve personally compelling mental representations, she did recognize that such pursuits were called for. Indeed, the opening chapter of her monograph closes with this admission:

> ...since I am concerned with the *value* we ascribe to our recollecting abilities, it will naturally be with the conscious end of the continuum that I shall be concerned. For I am interested in the fact that often memory is not merely something which we deliberately evoke, but is also something that

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[188] Warnock, Mary, *Memory*. (London: Faber and Faber, 1987), 6.

[189] Ibid., 11-12.

> comes charged with emotion and is highly prized. But it is necessary to bear in mind the physiological roots of memory in the flatworm and the octopus. For we shall never understand the position memory holds in its grander manifestation in art and life unless we are thoroughly prepared to accept its connections in the systems of the brain.[190]

It is therefore with a desire to fully appreciate and evoke memory's unique grandness and depth that we heed Warnock's advice.

Arguments touting the uniqueness of human memory are controversial.[191] These arguments have typically been formulated in at least one of two ways. Each depend, as Warnock understood, on "how you get to know about [memory]."[192] "You may get to know about it by, for instance, seeing it, or its effects, and you will give it, in this case, its physical description."[193] From this perspective, memory is an extraordinary *object* of inquiry. Another way to extol memory's uniqueness is fashioned on alternative epistemological grounds. In contrast to getting to know about memory objectively, that is, descriptively from

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[190] Ibid., 14.

[191] As the eminent memory scientist, Endel Tulving, whose work will fill this chapter and the next, makes clear about uniqueness: "…it is useful to keep in mind the fact that uniqueness is by no means unique to humans. Every species is unique in the sense that it possess features and traits that other species do not. Some of these unique features may be more conspicuous than others, and some may be better known than others, but the basic principle remains the same: If there were no differences between Species A and B, then they would be the same species." "Episodic Memory and Autonoesis: Uniquely Human?" in *The Missing Link in Cognition: Origins of Self-Reflective Consciousness*. eds. Herbert S. Terrace and Janet Metcalfe. Cary, NC: Oxford University Press, 2005, 4. Influenced by Tulving's work with episodic memory, Nicola Clayton, Timothy Bussey and Anthony Dickinson, for instance, found a species of scrub jay who apparently formed a 'what-where-when' representation of cached food sources. These researches refer to the scrub jay's mnemonic capacity as episodic-like memory and wonder if other animals have similar abilities. See Clayton, N.S., Bussey, T.J., and Dickinson A., "Can animals recall the past and plan for the future?," *Nature Reviews Neuroscience* 4, (2003): 685-691.

[192] Warnack, *Memory,* 4.

[193] Ibid., 4.

the outside, one may “experience it...directly, feeling it in your bones, perhaps, and then you will give it a different, or mental description”.[194] Viewed from this perspective, memory is *subjectively* unique. “As far as we know, members of no other species posses quite the same ability to experience again now, in a different situation and perhaps a different form, happenings from the past, and know that the experience refers to an event that occurred in another time and in another place.”[195] We must never dismiss either way of getting to know about memory. This project assumes that *both* arguments are essential. In this chapter and the next, I will incorporate objective and subjective perspectives on episodic memory and allow each to correct or enhance the other as need be.

In what follows, we will approach episodic memory as Warnock suggested - an essential, highly valued attribute of the human brain. Being able to consciously recall our previously experienced personal happenings is the exclusive purview of episodic memory. In the very least, one should come away from this chapter with an acute awareness that episodic memory is simultaneously related to and distinct from other types of memory. In our contemporary scientific setting, however, Warnock’s approach presents a formidable challenge. It necessitates that we veer into another scholarly realm altogether, namely, the cognitive neurosciences. Fortunately, we find scientists operating within this expansive set of disciplines who are attuned to some of the philosophical implications of their

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[194] Ibid.

[195] Tulving, Endel, *Elements of Episodic Memory.* (New York, NY: Oxford University Press, 1983), 1.

work. Integrative, transdisciplinary thinkers such as Endel Tulving, Daniel Schacter, and Eric Kandel, among others, will prove invaluable in this regard. The present discussion begins with Endel Tulving because arguably he, more than any other memory scientist, has influenced current understanding of what the episodic memory system is, how it functions, and why it has been - and should continue to be - centrally important for our future.

In 1995 a seminal textbook in cognitive neuroscience was published.[196] Its contributors gave detailed reports on current research projects, proposed new theories and models to account for various cognitive phenomena, and suggested designs for future experiments. The eight chapters dedicated to the cognitive neuroscience of memory were preceded by an introduction from Endel Tulving. In his orienting remarks Tulving offers several provocative proposals, an enlightening litany of “Memory is...” statements including the following:

> *Memory is a gift of nature*, the ability of living organisms to retain and utilize acquired information or knowledge.
>
> *Memory is a trick that evolution has invented* to allow its creatures to compress physical time.
>
> *Memory is a biological abstraction*.
>
> *Memory is a convenient chapter heading* designating certain kinds of problems that scientists study.[197]

Like the philosophers in the previous chapter - from Plato and Aristotle to Augustine and Ricoeur - who struggled with some entrenched aporias of memory, Tulv-

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[196] *The Cognitive Neurosciences* ed. Michael S. Gazzaniga. (Cambridge, MA: MIT Press, 1995)

[197] Ibid., 751 emphasis added

ing's litany recognizes that memory is fundamentally ambiguous. It is both a gift and a trick; it is an abstraction and an organizing category guiding specific strands of scientific research. To this litany, we can add another entry, an almost Augustinian veneration of memory Tulving recently professed. What we often take for granted as "just remembering," is actually "an unbelievably complicated and near-miraculous invention of nature".[198] To varying degrees, the following chapters will elaborate Tulving's entire litany by paying particular attention to memory of the episodic type.

To do justice to Tulving's work, and to the cognitive neuroscience of memory in general, and to properly contextualize episodic memory for its later explication from the perspective of religious naturalism, this chapter, *Memory's Natural Width*, endeavors to evince key aspects of the subjective uniqueness of episodic memory. It will draw evidentiary support from neuropsychological reports and behavioral analyses.[199] We will pay particular attention to how episodic memory is different from other mnemonic types because of its complicated relationship to time and consciousness. Accumulating evidence is demonstrating that episodic memory functions not only to ensure that we remember our past, but also that we can imagine our future. The essential assertion to be grasped here is that human beings have no meaningful relationship to time without the capacity for episodic memory. In the next chapter, *Memory's Natural Depth*, I will rehearse some of the

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[198] Tulving, "Episodic Memory and Autonoesis: Uniquely Human?" 41.

[199] Bickle, John, "Memory and Neurophilosophy," in *The Memory Process: Neuroscientific and Humanistic Perspectives*. eds Suzanne Nalbantian, Paul M. Matthews, and James L. McClelland. (Cambridge, MA: MIT Press, 2008), 198-199.

evidence detailing the neurological underpinnings of this capacity. In that chapter, we will have to contend with various theoretical models and empirical data that objectively explore episodic memory *all the way down* to its neuroanatomical and cellular and molecular levels.[200] Chapter 3 will therefore endeavor to outline, at increasingly lower levels of analysis, the patterns of neural activation believed to support the generation and maintenance of episodic memory. In the final chapter of this project I will argue that our very knowledge of such patterns is scientifically laudable, philosophically meaningful, and religiously relevant. In short, the neurological patterns of activation undergirding episodic memory are, I submit, evolutionarily special, even spiritually portentous.

An engagement with these specialized discourses on the width and depth of memory is worthwhile because such inquires, if effectively brought together, may, in the long run, allow us to bridge what Edward Slingerland calls "physical" and "human-level truths".[201] Nearly three decades ago, Warnock advocated for another, related bridge. She hoped that one day we would stop "talking as if there

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[200] Ibid., 198. Within the philosophy of science, the notion of 'levels' has been extensively discussed and openly questioned. In this chapter and the next, my analysis of memory has been construed as one which proceeds from higher to lower levels of analysis. In these two chapters, what I intend to convey in my use of 'levels of analysis' is roughly equatable with different scientific disciplines, all interested in memory, but differently trained and differently attuned to various mnemonic data. That is, in 'descending' order - behavior of the entire human organism, the cognitive systems operative in the human brain, the neuroanatomy of episodic memory, and the cellular and molecular processes in specific subcortical areas. In the final chapter, I will utilize Carl Craver's vision for how to think about the unity of memory science not based on levels but rather on explanatory mechanisms. Craver's sense for the "mosaic unity of neuroscience," in the last chapter of this project will also find resonance with Lawrence Cahoone's "orders of nature". Cahoone, *The Orders of Nature*. (Albany, NY: SUNY Press, 2013) and Craver, *Explaining the Brain: Mechanisms and the Mosaic Unity of Neuroscience*. (New York: Oxford University Press, 2007)

[201] Slingerland, Edward, "Neuroscience, Theory of Mind, and the Status of Human-Level Truth," in *Neuroscience and Religion: Brain, Mind, Self, and Soul*. ed. Volney P. Gay. (Lanham, MD: Lexington, 2009)

were mental entities, or mental events, on the one hand, and physical entities or events on the other. The difficulty is, and always has been, to find a language which does not take such a dichotomy for granted."[202] The hope of these final three chapters is to move toward the confluences Warnock and Slingerland envisioned. The challenge for the remainder of this project, then, will be to craft a multi-dimensional scientific narrative of the unique whence and whither of episodic memory with religious import. This complex story begins with Tulving and his impressive expansion of mnemonic research and inquiry.

### *I. Knowing the Time*

*"...the main thing is that one must know the time"*[203]

As Paul Ricoeur reminds us, students of memory are forever indebted to Aristotle for his insistence that time and memory are irrevocably related.[204] The philosopher left us with a straightforward proposition: "memory is of the past" (449b15). "To put it bluntly," Ricoeur elaborates, "we have nothing better than memory to signify that something has taken place, has occurred, has happened *before* we declare we remember it."[205] However, in recent years, philosophically savvy scientists of memory have argued that Aristotle's proposition needs to be more specific with regard to memory and more expansive with re-

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[202] Warnock, *Memory*, 2.

[203] Aristotle's *On the Soul*; and, *On Memory and Recollection*. trans. Joe Sachs. 452b7

[204] Ricoeur, *Memory, History, Forgetting,* 15-21.

[205] Ibid., 21.

gard to time. Actually, for Endel Tulving, there is reason to formulate an entirely new proposition - one that not only registers the precise relationship between memory and time, but also recognizes that both are fundamentally connected to consciousness as well. Tulving did not immediately arrive at this suffusive convergence, nor did he travel toward this complexity alone. As Ricoeur's outline in the previous chapter of the tradition of inwardness attests, philosophers have left traces along the way which anticipate central features of the threefold dynamic Tulving finally insists on. In this section, we will confront a few thinkers who, with Aristotle, were aware that when it comes to memory, "the main thing is that one must *know* the time." (452b7 emphasis added)

William James and Henri Bergson ingeniously explored the relationship between memory and time. In their respective attempts to articulate this relationship, both philosophers helpfully introduced basic ways to classify mnemonic phenomena. In *Matter and Memory*, Bergson describes two varieties of memory: "pure" or "recollective" and "habit." Habit memory, according to Bergson, "bears upon it no mark which betrays its origin and classes it in the past; it is part of my present, exactly like my habit of walking or of writing; it is lived and acted, rather than represented".[206] In contrast to pure/recollective memory, habit memory is not defined by time. Rather, for Bergson, habit memory is simply an action performed in the present. As James explained, using the generic terms "primary" and "secondary," "primary memory is not thus brought back; it never was lost; its date was

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[206] Henri Bergson, *Matter and Memory.* trans. Nancy Margaret Paul and W. Scott Palmer. (New York, NY: Macmillan, 1929), 91.

never cut off in consciousness from that of the immediately present moment. In fact it comes to us as belonging to the rearward portion of the present space of time, and not to the genuine past."[207] Habit memory and primary memory are therefore not really about the past at all. Both types would currently fall under the same broad heading in contemporary taxonomies of memory as "implicit" or "procedural memory." An eminent expert in mnemonic classification recently wrote that procedural memory

> reflects the various ways that we have learned to interact with the world. Performance changes as the result of experience, and in this sense deserves the term memory, but performance changes without requiring any conscious memory content or in many cases even awareness that memory is being used.[208]

Viewed through Tulving's original litany, procedural memory is nature's ubiquitous gift. It names "the ability of living organisms to retain and utilize acquired information or knowledge."[209] For Warnock, this is the kind of memory "by the possession of which an animal learns from experience."[210] Contrary to Aristotelian insight, then, it would seem that memory is not *always* about the past. Or perhaps, one should be more precise in this instance and argue with Ricoeur that procedural

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[207] William James, *Principles of Psychology* vol. 1, (New York: Cosimo, 2007), 647.

[208] Squire, Larry R., "Memory Systems: A Biological Concept," in *Science of Memory: Concepts*. eds. Henry L. Roediger III, Yadin Dudai, and Susan M. Fitzpatrick. (New York: Oxford University Press, 2007), 340.

[209] Tulving, in *The Cognitive Neurosciences,* 751

[210] Warnock, *Memory,* 6.

memories fail to exhibit “temporal distance”.[211] Temporal distance is a useful descriptor for Ricoeur. Like Bergson and James, Ricoeur realizes that considerations of time help to distinguish mnemonic phenomena. In this way, the notion of temporal distance serves to organize mnemonic phenomena “relative to temporal depth, beginning with those in which the past adheres, so to speak, to the present and continuing on to those in which the past is recognized in its pastness as over and done with.”[212] Procedural memory lacks temporal distance. During instances of habit or primary memory, time is not experienced as over and done with. Time is not experienced as such but is rather conflated with a present activity. Habitual procedures, then, often mask the flow of time.[213] Our fundamental concern here, however, is not with memories of the procedural variety.[214] Instead, we are preoccupied with the unique nature of episodic memory. As James, Berg-

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[211] Ricoeur, *Memory, History, Forgetting*, 18, 40, 102. The notion of “temporal distance” also plays a role in the scientific study of memory as an experimental variable whereby test subjects are asked to recollect memories from decades ago to see how this might effect images of the mnemonic brain. It is unclear if Ricoeur was aware of this use of temporal distance in the cognitive neurosciences. For an understanding of temporal distance in memory science literature see: D.R. Addis and D.L. Schacter, “Constructive episodic simulation: temporal distance and detail of past and future events modulate hippocampal engagement.” *Hippocampus* 18 (2008): 227–237. and A. D’Argembeau, and M. Van der Linden, “Phenomenal characteristics associated with projecting oneself back into the past and forward into the future: influence of valence and temporal distance,” *Conscious. Cogn*. 13 (2004): 844–858.

[212] Ricoeur, *Memory, History, Forgetting,* 25.

[213] Of course, one can rescue habitual actions from temporal oblivion by simply paying attention to what one is doing while one is doing it. Conscious awareness, as we will see, is also a key factor in distinguishing between mnemonic phenomena.

[214] M.A. Wheeler, “Episodic Memory and Autonoetic Awareness,” in *The Oxford Handbook of Memory.* “It is pretty easy to make the case that episodic remembering is distinct from procedural, or nondeclarative, or ‘implicit’ kinds of memory; probably no one, layperson or cognitive psychologist, would confuse episodic recollection with motor learning, or perceptual priming, or classical conditioning. These manifestations of memory have little surface similarities with acts of recollection.” 598.

son, and Ricoeur undoubtedly understood, Aristotle's original proposition applies to memory of the episodic type. For Tulving, only episodic memory is oriented to the past. In fact, "there is no pastness in any other memory system in humans and no pastness in any memory system in all other creatures".[215] In Tulving's estimation when "William James and Henri Bergson wrote about the 'pastness' of memory, they had in mind what we now refer to as episodic memory, even if they did not use the term."[216]

Before Endel Tulving set forth his understanding of episodic memory, James and Bergson wrote about secondary and pure memory, respectively. Residing at the other end of their continua, secondary and pure memory, unlike primary and habit memory, are more explicitly related to time. That is, both types can be characterized by a definite temporal distance. The French philosopher and phenomenologist argued that pure memory "records, in the form of memory-images, all the events of our daily life as they occur in time; it neglects no detail; it leaves to each fact, to each gesture, its place and date."[217] While James expressed a similar notion about the temporality of secondary memory, he also emphasized that this kind of memory was the product of conscious reflection. The American philosopher and psychologist, wrote that secondary memory, or "[m]emory proper," is "the knowledge of a former state of mind after it has already once dropped from consciousness; or rather it is the knowledge of an event, or

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[215] Tulving, *Missing Link,* 16-17.

[216] Ibid., 16.

[217] Bergson, *Matter and Memory*, 92

fact, of which meantime we have not been thinking, with the additional consciousness that we have thought or experienced it before."[218] As the unfolding discussion will clarify, it is essential to notice that Tulving appears to have defined episodic memory by combining these two fundamental insights: Bergson's sensitivity to the ways in which memory is temporally organized and James's understanding that memory is constitutively bound up with our conscious awareness. Secondary and pure memory should, therefore, be recognized as the intellectual precursors to what is currently referred to as episodic memory. In contemporary taxonomies of memory, episodic memory is a specific kind of declarative, or "explicit," memory. According to Larry Squire, declarative memory is

> representational, and what is learned is expressed through recollection. Declarative memory provides a way to model the external world, and in this sense is either true or false. It is the kind of memory that is referred to when the term 'memory' is used in everyday language.[219]

Episodic memory is one of the two types of declarative memory. The other type is referred to as "semantic" memory. Largely through the efforts of Tulving, memory scientists currently investigate declarative memory in one of these two major forms. Like James, Bergson, and Ricoeur, Tulving formulated this basic distinction by rethinking Aristotle's proposal about the relationship between memory and

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[218] James, *Principles of Psychology* vol. 1, 648. John Locke struggled to clarify this point before James. See *An Essay Concerning Human Understanding,* 133-150.

[219] Squire, "Memory Systems: A Biological Concept," in *Science of Memory: Concepts,* 340. John Sutton offers this explanation of the differences between declarative and non-declarative types of memory. "Both semantic and episodic memories, whether linguistically expressed or not, usually aim at truth, and are together sometimes called 'declarative memory,' in contrast to nondeclarative forms of memory, which don't seem to represent the world or the past in the same sense. In declarative remembering, we seek to track the truth: this is why we are uneasy of dismayed when our take on the past is challenged or overturned." "Memory," *Stanford Encyclopedia of Philosophy,* first published Apr 24, 2017, https://plato.stanford.edu/entries/memory/ ,4.

time. In fact, Tulving eventually broke declarative memory down into its semantic and episodic types based, in large part, on an empirical observation that each type manifests a different temporal organization, or schemata.

In *Elements of Episodic Memory*, a groundbreaking monograph in the history of memory research, Tulving elucidates what he sees as the major aspects of the episodic and semantic memory systems,[220] including descriptions of their fundamental interactions. Laudably, his ideas are formulated with an openness toward further theoretical debate and continual empirical refinement.[221] The semantic memory system, according to Tulving, includes a wide range of informa-

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[220] In his most succinct attempt to explain what he means by a memory 'system,' Tulving begins by elaborating what this designation does not mean. In "Episodic Memory and Autonoesis," he writes: "It does not refer to a particular kind of memory task, or a particular kind of performance measure in a task, or a particular kind of stored information, or a particular kind of phenomenal experience, or to any alternative sense in which it sometimes appears in the contemporary literature. All these other senses are related to episodic memory, but they are not identical with it. … Like all other systems, episodic memory consists of a number of interacting neural and cognitive components which together are capable of operating in a manner that the same components in isolation, or in different combinations, cannot. Like all other neurocognitive systems, it is complex and not easily summarized in a few words. It is defined in terms of criteria such as a system's function - what the system does, how it works, the kind of 'information' that it deals with, its relations to other systems, and its neural substrates. Convergent dissociations, observed across tasks or subjects, play an important role in the identification of the properties of a memory system, but they are not the only features of the definition." 9-10.

[221] Tulving was ambivalent about the terms themselves. As he explains in *Elements of Episodic Memory*, the designation of 'semantic' was a term borrowed from linguistics and "in retrospect seems to have represented a less happy choice. Its connotations are simply not quite right for the realm of phenomena to which it is supposed to refer. In many ways a better expression would be 'knowledge of the world', which indeed has been used by many writers. Then the contrast would be between memory and knowledge, requiring no use of adjectival modifiers at all. In this case we would be back where William James was in 1890." 28. For a recent advocate of this final point (i.e., knowledge and/as memory) see Lynn Nadel, "Consolidation: The demise of the fixed trace" in *Science of Memory: Concepts*. Nadal writes, "Wexler and I suggested that the notion of 'knowledge' should be substituted for the concept of 'memory'. As a function of experience we obtain knowledge, which is represented in various brain systems. What we call 'memory' is constructed from this knowledge as required." p. 180. With no small hint of resignation, Tulving opted, pragmatically, to keep both terms. "Because of the widespread acceptance of the distinction between episodic and semantic memory, however, and because most people now correctly think of semantic memory as knowledge of the world, it may be both difficult and unnecessary to start revising the terminology." Ibid, 29.

tion - facts, dates, concepts, and vocabulary. It is properly understood as the mental repository of one's general knowledge about the world. Tulving does not think that memories attributable to the semantic system are encoded, catalogued, or otherwise 'stored' in an individual's mind according to the time or place of their acquisition, however. This means that one can have a vast reserve of semantic memory knowledge without actually being able to recall the precise source or specific context surrounding the learning of this information. For example, I can know that the capital of South Dakota is Pierre, or any capital city for that matter, without remembering when, where, and from whom I may have learned this fact. Within the semantic memory system specific references to time, or any number of other contextual details concurrent with the acquisition of a bit of information, are largely irrelevant. Episodic memories, on the other hand, are inextricably bound up with such details. Like Bergson's recollective memory, Tulving insists that "each event in the episodic system is referred to a particular instant, date, or period in time."[222] It was the summer before I turned eight years old that I remember driving through Pierre, South Dakota during a family trip to the Black Hills. We passed by the capital building, and I was told by my mother what it was. A bright, high sun was shining down directly upon the building. Before we drove away to find the Interstate again, I remember seeing a stark architectural contrast. The image in my mind is of a dark rounded dome set atop a gleaming white, rectangular facade. To me, as a seven year old boy, the building looked important. Tulving explains that memories such as these are typical of the

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[222] Tulving, *Elements of Episodic Memory*, 39.

episodic system. Often the rememberer can provide a detailed account of the time and place when a certain piece of information was learned. The rememberer may even be able to recount what else was going on at the time and even some of the feelings which may have emerged before and after the experience. In this way, we can begin to appreciate the subjective value of episodic memories. These recollections are fashioned within the course of our personally unfolding histories, and their preservation in our minds actually establishes the narrative bedrock of our individual self-understanding. What Aristotle said about recollection in general is true of episodic memory in particular: “the main thing is that one must know the time”. However, Tulving will argue that time, like memory itself, is not one of a kind.

Psychologically astute and empirically rigorous, Tulving notices that time can be appreciated in a number of ways. As indicated previously, procedural memories are experientially enfolded within an ongoing present activity. Time is subsumed. With regard to the declarative memory systems, time’s passing is discernible. Time can be explicitly marked off, albeit in two very different ways. Tulving explains that the

> semantic system handles temporal concepts as it does others, with reference to the world that exists independently of the individual. In that world events have temporal relations, but these relations have nothing to do with personal time. Whereas temporal relations of events in episodic memory are recorded experientially in subjective time, propositions entailing temporal relations in semantic memory are represented symbolically in abstract time.[223]

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[223] Ibid., 42.

Thus, for Tulving, the temporal organization of declarative memory bifurcates along an objective/subjective continuum. This creates two very different organizations or temporal schemata. One is objective and abstract; the other is subjective and personal. Semantic memory measures or records time as a set of conceptual relations while episodic memory narrativizes time as a sequence of events that have occurred according to a personally unfolding rubric.[224] The semantic memory system, therefore, may refer to "chronological time or calendar time," while the episodic memory system keeps track of time according to "the rememberer's personally experienced time, and at recollection, his personal past."[225] This is why Tulving argues that semantic memory has no 'pastness'. In the realm of semantic memory, one can know and recount the time of day, the day of the week, the season of the year, or even the correct calendar year of any historical event. However, without a personal connection, we cannot meaningfully relate this knowledge to our own particular past. In the episodic realm, our sense of time is subjectively registered. And it is this sense of time that makes "a huge difference to what we are and how we live."[226] Only through our capacity for episodic memory are we able to experientially relate to what has occurred before.

The different temporal organizations of memory matter greatly. Understanding the ways time and memory relate have not only been important for the

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[224] Ibid., 21

[225] Ibid., 39.

[226] Tulving, "Chronesthesia: Awareness of Subjective Time," in *Principles of Frontal Lobe Function* eds. D.T. Stuss and R.C. Knight, (New York: Oxford University Press, 2002), 312

taxonomic efforts from Bergson to Squire but, more importantly, confirms something essential about what it *feels like* to remember. “When I remember an episode of my personal history,” Sutton explains, “I come into contact with events and experiences which are no longer present. My conception of my own life involves narratives in which such experiences are interrelated.”[227] Episodic memory ensures that personal happenings from another time come back to us again. We experience these mental visitations with a certain “warmth and intimacy,” to borrow James’s apt description.[228] Memories attributable to the episodic system are intimate and elicit a proprietary feeling within us. Right now, we can travel back through time and remember that *we* have a past and that we *know* that this past is ours. “If we retained all our other marvelous mental capacities but lost the awareness of time in which our lives played out, we might still be uniquely different from all other animals but we would no longer be human as we understand humanness.”[229] Aristotle’s original insight should therefore be rephrased: episodic memory is of *my* past. Such a reformulation recalls something James sagaciously highlighted over a century ago: memory is intimately intertwined with conscious awareness.

### *II. Memory, Consciousness & Mental Time Travel*

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[227] Sutton, “Memory,” *Stanford Encyclopedia of Philosophy*, first published Apr 24, 2017 http://plato.stanford.edu/entries/memory/ ,5.

[228] James, *Principles of Psychology* vol. 1, 650.

[229] Sutton, “Memory,” 5.

Tulving's research took a decidedly Jamesian turn after he published his pioneering book about episodic memory. In an article entitled, "Memory and Consciousness," Tulving argues that it is insufficient to think only about memory's relationship to time. He implores students of memory to consider consciousness as well.

> One can read article after article on memory, or consult book after book, without encountering the term 'consciousness.' Such a state of affairs must be regarded as rather curious. One might think that memory should have something to do with remembering, and remembering *is* a conscious experience. To remember an event means to be consciously aware now of something that happened on an earlier occasion. Nevertheless, through most of its history, including the current heyday of cognitive psychology, the psychological study of memory has largely proceeded without reference to the existence of conscious awareness in remembering.[230]

Tulving recognized that the paucity of attention to consciousness in memory science was not true of other disciplines. However, while the "literature on consciousness is rich," most of the attention "consists of 'epistemological, metaphysical, and existential theorizing'...without corresponding empirical facts."[231] Tulving argues that consciousness should be studied using "data obtained through clinical observation and laboratory experiment."[232] Scientifically investigating consciousness, particularly with regard to how it relates to memory and time, is extremely complex. In the very least, thoughtful inquirers must entertain new assumptions. As we witnessed with time and memory, Tulving does not consider consciousness to be one of a kind in this article. He is therefore convinced that

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[230] Tulving, Endel, "Memory and Consciousness," *Canadian Psychologist.* 26(1985): 1- 12, 1.

[231] Ibid.

[232] Ibid., 2.

"progress in the scientific understanding of consciousness...requires not only the postulation of different *kinds* of consciousness but also their *measurement* as an aspect of experience, or as a dependent variable."[233] "Memory and Consciousness" is important for at least two reasons. First, it forwards three different empirically tractable forms of consciousness and, second, it introduces an innovative quantitative technique - now referred to in the literature as the remember/know paradigm - through which to begin to disentangle the two declarative memory systems and to delineate the complex convergence of time, memory, and consciousness as it emerges in human experience. Tulving's basic claim is that the three memory systems - procedural, semantic, and episodic - each enable a different variety of consciousness. He names these varieties, tentatively describes aspects of each one, endeavors to empirically contrast them, and then, finally, suggests some of their evolutionary advantages.

According to Tulving, procedural memory is accompanied by an "anoetic (non-knowing)" consciousness.[234] Memories of the procedural type, as was established above, entail "remembering how,"[235] that is, like my habit of walking, they are "concerned with how things are done - with the acquisition, retention, and utilization of perceptual, cognitive, and motor skills".[236] As such, procedural

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[233] Ibid.

[234] Ibid., 3.

[235] Sutton, "Memory," 4. The British philosophy, Gilbert Ryle, was the first to articulate the remembering how/remembering that distinction. See his *The Concept of Mind.* (New York: Hutchinson, 1949), 26-60.

[236] Tulving, "Memory and Consciousness," 2.

memories are characterized by a variety of consciousness that is "temporally and spatially bound to the current situation."[237] While rudimentary, non-knowing consciousness is still valuable. Organisms endowed with anoetic consciousness are "conscious in the sense that they are capable of perceptually registering, internally representing, and behaviourally responding to aspects of the present environment, both external and internal."[238] However, anoetic consciousness is severely limited. Its efficacy is confined to an immediate context. This kind of consciousness simply cannot accommodate any "non-present extraorganismic stimuli and states of the world."[239] Organisms anoetically conscious interact with their environments via reflexes, not reflection.

Semantic memory, by contrast, entails "remembering that,"[240] (i.e. remembering that the capital of South Dakota is Pierre or remembering that a food source is located in that tree over there). Semantic memory, as the repository of "symbolically representable knowledge that organisms possess about the

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[237] Ibid., 3.

[238] Ibid.

[239] Ibid.

[240] Sutton, "Memory," 4.

world,"[241] manifests a "noetic (knowing)" kind of consciousness.[242] According to Tulving, it "allows an organism to be aware of, and to cognitively operate on, objects and events, and relations among objects and events, in the absence of these objects and events."[243] If an organism is endowed with noetic consciousness, then it can effectively use previously learned information. This invaluable information travels with the organism to helpfully guide its interactions with the environment. Tulving speculates that noetic consciousness has been extremely useful, evolutionarily speaking. As an organism learns about its world through repeated experiences - its affordances and its threats - its surroundings becomes more predictable, less dangerous. Noetic consciousness therefore benefits an organism by giving it a way to develop greater levels of behavioral flexibility, enough flexibility, that is, for it to profit from its environment or to be protected against it, as the case may be. In short, an organism thrives to the extent that it can effectively utilize its repository of semantic memory through noetic consciousness.[244]

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[241] Tulving, "Memory and Consciousness," 2.

[242] Ibid., 3. With regard to this distinction Tulving admits it "is based on conjecture." However, "it is not without precedent." The precedent being observations articulated by Hermann Ebbinghaus, an extremely important thinker within the history of memory research who is credited with initiating a methodological revolution using experimental stimuli of his own design so as to limit mnemonic associations as an experimental artifact. *Memory: A Contribution to Experimental Psychology.* trans. Henry A. Ruger and Clara E. Bussenius, and with a new introd. by Ernest R. Hilgard. (New York: Dover Publications, 1964)

[243] Tulving, "Memory and Consciousness," 3.

[244] Ibid.

Episodic memory is a different animal. It enables “autonoetic (self-knowing) consciousness,” or autonoesis in Tulving’s terminology. Compared to the other forms of consciousness, autonoesis provides even greater benefits to the organisms who possess it. Like noetic consciousness, autonoetic consciousness supports the ability to learn from experience. Unlike the noetic variety, it serves not only to enhance the “perceived orderliness of an organism’s universe,”[245] but generates a knowledge of the world which is highly accountable to the life history and specific circumstances of the individual organism. Tulving explains that self-knowing consciousness is “more advanced” than noetic consciousness and “has a more recent origin in evolution.”[246] The essential adaptive value of autonoesis, in Tulving’s view, resides in its ability to establish a “heightened subjective certainty with which organisms endowed with such memory and consciousness believe, and are willing to act upon, information retrieved from memory.”[247] Tulving proposes that autonoetic conscious awareness integrally supports “more decisive action in the present and more effective planning for the future.”[248] While Tulving’s sense of the evolutionary benefits of episodic memory will continue to evolve, in “Memory and Consciousness” it is the establishment of our ‘heightened subjective certainty’ to act in the present and to effectively plan for the future which become the primary evolutionary upshots of autonoesis.

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[245] Ibid., 10.

[246] Tulving, “Chronesthesia,” 314.

[247] Tulving, “Memory and Consciousness,” 10.

[248] Ibid.

In the same way that considerations of memory's relationship to time helped to distinguish mnemonic phenomena, discussing memory's relationship to consciousness, even briefly, also helps to clarify the differences between procedural, semantic, episodic memory systems. These important distinctions have cleared the way for Tulving to concentrate on episodic memory in particular and its intimate connections to subjective time and autonoetic consciousness. He is unequivocal about the importance of this threefold convergence. "According to the scheme I am describing, there is no such thing as 'remembering without awareness' ... Organisms can behave and learn without (autonoetic) awareness, but they cannot remember without awareness. Nor can nonliving matter remember anything, even if it can act upon previously stored information."[249] For Tulving, memory, time, and consciousness weave tightly together. This triad is what "makes thinking about subjective time possible."[250] Indeed, this suffusive convergence is what makes autobiographical memory conceivable.

Remembering episodically is a self-reflective act whereby vast stretches of chronological time become subjectively superfluous. In the present moment I am able to reach across extensive temporal distances and recount what has occurred before. This is a familiar human experience. Tulving gives it formulaic expression. "The individual does something at Time 1 and remembers it at Time 2. But, episodic memory differs from all others in that at Time 2, its time's arrow is

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[249] Ibid., 5.

[250] Tulving, "Chronesthesia," 313.

no more an arrow, it loops back to Time 1."[251] The 'looping back' of time, a folding of time upon itself, is a radical mark of human subjectivity. This is memory's great trick. The fact that we are able to bend the arrow of time into a loop is, for Tulving, a "trick evolution invented to allow its creatures to compress physical time."[252] He has written exclusively about this temporal trick of nature. Tulving calls it *chronesthesia* and describes it as our ability to travel mentally through time.[253] Mental time travel is special. It allows us to "circumvent" nature's own "most fundamental law of the unidirectionality of time."[254] We posses a trick that can both compress and widen time. Chronesthesia allows us to 're-live' events previously lived through and to 'pre-live' events yet to be lived out, all while remaining firmly situated in the here and now.

At this point in Tulving's career, research into the convergence of episodic memory, chronesthesia, and autonoesis was just beginning to ramp up. This can be understood as his first empirical phase. It included several, simple psycholog-

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[251] Quoted in Schacter, Wagner, and Buckner, "Memory Systems of 1999," in *The Oxford Handbook of Memory*, eds. Endel Tulving and Fergus I.M. Craik, (New York, NY: Oxford University Press, 2000), 633

[252] Tulving, *The Cognitive Neurosciences,* 751.

[253] Tulving, "Chronesthesia," 312.

[254] Ibid., 322.

ical experiments[255] which were designed to test a model of memory retrieval he

[255] Each experiment conceptually depends on Tulving's proposal that all three mnemonic types imperfectly overlap to create an interactive structure of the mnemonic mind. The challenge is to experimentally disentangle this admixture of influences. In one experiment, for example, subjects heard, just once, a list of twenty seven "category names and single category instances." For example, participants were given the category "musical instrument" and the instance "VIOLA", or "fruit" and "PEAR". The subjects were then tested on this material three times. In the first test, the subjects were told to just freely recall "as many instances as they could, in any order." For any items not freely recalled, a second test was administered in which subjects were given the category name as a cue to induce recall of the adjoining category instance. In the third test, subjects were given both the name of the category and the first letter of the adjoining instance as cues to induce recall of any additional items not recalled in either of the first two successive tests. When Tulving compared the results of the three tests he found that there is a "trade-off relation…such that impoverished episodic traces can be compensated for by richer retrieval cues, and vice versa." This is a key insight. According to Tulving, successful recall can occur in any number of ways according to the relative strength of the episodic trace. If the episodic trace is strong, it is freely recalled. But if the trace is weak, semantic cue information can be utilized to recover the information sought. Tulving's simple experiment shows how we often borrow from both the semantic and episodic memory systems, albeit in different degrees in different contexts. To begin to quantify the influence of autonoesis Tulving also asked participants "to indicate, in each item they recalled, whether they actually 'remembered' its occurrence in the list or whether they simply 'knew' on some other basis that the item was a member of the study list." That is, was 'PEAR' given as an answer to 'fruit' because they actually remembered hearing this specific example read aloud during the initial moments of the experiment? The question is methodologically significant because it endeavors to substantively incorporate self-reports into Tulving's memory experiment. By asking participants to make a remember/know distinction, Tulving is attempting to gather evidence that bears directly on the subjective nature of episodic memory. The remember/know paradigm, according to Levine et al., therefore, not only "permits separation of episodic from non-episodic contributions to memory tests by quantifying subjects' reports of re-experiencing aspects of the encoding episode," but it also provides Tulving with a way to begin to isolate the contributions of autonoetic awareness during memory retrieval tasks. It is also significant that Tulving's experiments found participants to be more confident about their recollections if they were based on episodic trace information rather than on semantic cue information. This means that test subjects were subjectively more certain about what they remembered than about what they claimed to know in some other way. B. Levine, S.E. Black, R. Cabeza, M. Sinden, A.R. McIntosh, and J.P. Toth, "Episodic memory and the self in a case of retrograde amnesia," *Brain*, 121 (1998): 1951–1973, 1951.

introduced years earlier.[256] While Tulving's initial findings are compelling,[257] there was serious demand for more evidence. His pioneering efforts should be commended, however, not only because they were the first to attempt to empirically study the interactive capacities for episodic memory, chronesthesia, and autonoetic consciousness. His work also paved the way for many of the other investigations to which we now turn.

### *III. Memory and Lost Time: A Narrow Present Becomes Them*

Contemporary studies utilize psychological experimentation and clinical observations while fully embracing various neuroimaging techniques. The second major phase of Tulving's inquiry has been to gather clinical evidence for his triad.

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[256] Tulving developed a theoretical model in *Elements of Episodic Memory* to explain how the admixture of mnemonic influences actually function in everyday life. He calls it the "synergistic ecphory model of retrieval", 311-315. The terminology betrays his indebtedness to the work of a German biologist named Richard Semon. Semon, once a marginalized figure in the history of memory science, is now properly celebrated for his prescient conceptualization of the engram and the processes of ecphory. *The Mneme*. (New York, NY: Macmillian, 1921), 138. Semen also wrote *Mnemic Psychology*. trans. Bella Duffy. Introduction by Vernon Lee. (London: George Allen & Unwin, 1923). For a biographical sketch of Semon and a persuasive argument for his importance for contemporary memory science see Daniel L. Schacter's *Stranger Behind the Engram: Theories of Memory and the Psychology of Science.* (Hillsdale, NJ: Lawrence Erlbaum, 1982). Tulving follows Semon in attempting to account for how we readily utilize semantic knowledge and our remembrances of things past to retrieve information.

[257] It is of vital importance, both scientifically and existentially, to recognize that our experiences of recollection extensively draw from both episodic and semantic memory systems. Their interactions are constant and complicated. Whether we are attempting to recognize a word from a previously studied pair or words, as mandated by a psychological experiment, or whether we are trying to recall the name that goes with the familiar face we see before us on the street corner, memory retrieval processes, according to Tulving, can promiscuously borrow content from both semantic and episodic memory systems to recover the past information we are seeking. By duly recognizing the influence of semantic memory cues, Tulving challenges memory theorists who, for example, lean too heavily, even mystically, on assumptions about the efficacy of the engram - the episodic trace - which somehow they claim just resurfaces in an act of recollection after an indeterminate period of latency. From whence the engram comes, these theorists cannot say. On the other hand, Tulving does not minimize the efficacy of episodic traces. Rather, his interest has been to understand the episodic memory system by trying to empirically uncover precisely why and when these mnemonic traces emerge and how we experience them in specific retrieval contexts.

Clinical evidence, particularly from patients with significant neurological impairments, has become a staple in the scientific study of memory at least since the famous and extremely influential case of Henry Molaison, (H.M.).[258] It must be noted, however, that case studies form but one large wave within an accumulating ocean of evidence that must be considered and corroborated by those trying to understand how and why episodic memory functions the way it does. To advance our discussion of the Tulvingian triad, it will be helpful to review three case studies in particular. These cases variously demonstrate what it looks like for an individual to be without episodic memory, the capacity for mental time travel, and autonoetic consciousness. These amnesic patients, referred to in the literature as K.C.,[259] M.L., and D.B., are also important for our purposes because they offer additional empirical support for at least three of the theoretical distinctions we've been pursuing so far: memory types (episodic and semantic); temporal organizations of memory (chronological and subjective); and varieties of consciousness (autonoetic and noetic).[260]

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[258] Suzanne Corkin, *Permanent Present Tense: The Unforgettable Life of the Amnesic H.M.* (New York: Basic Books, 2013)

[259] In "Memory and Consciousness," K.C. was referred as N.N. As Tulving explains in another published work "...N.N in ["Memory and Consciousness"] is the same patient that in subsequent publications is referred to as K.C." Tulving, "*Chronesthesia,"* 6.

[260] Wheeler, "Episodic Memory and Autonoetic Awareness," 599.

K.C. is an amnesic patient whose cognitive impairments stemmed from operations he'd undergone after a motorcycle accident.[261] M.L.'s amnesic condition emerged after he suffered a severe traumatic brain injury in a cycling accident.[262] D.B. suffered a heart attack while playing basketball. His amnesia is most likely the result of his brain being deprived of oxygen for an extended period of time until he was eventually resuscitated.[263] While we must be cautious about making generalizations from amnesic patients - cognitive impairments and retained capacities are often highly unique to each individual - there are indications of a certain kind of psychological profile of competencies and deficits which emerges from the clinical details of these three cases, a profile illustrative of Tulving's insistence on the interactions between memory, time, and consciousness.

With regard to cognitive competencies, it was observed that these individuals retained a number of capacities relevant to the semantic memory system and, by extension, to noetic consciousness. For instance, K.C.'s language skills and general knowledge about the world are "relatively intact." He can "define words such as 'evasive,' 'perimeter,' and 'tangible,'" and he can "provide a reasonably good verbal description of the 'script' of going to a restaurant or making a

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[261] R. Rosenbaum, Shayna, Stefan Kohler, Daniel L. Schacter, Morris Moscovitch, Robyn Westmacott, Sandra E. Black, Fugiang Gao, and Endel Tulving, "The Case of K.C.: Contributions of a memory-impaired person to memory theory," *Neuropsychologia* 43 (2005): 989-1021.

[262] Levine et al., "Episodic Memory and the Self in a Case of Isolated Retrograde Amnesia," *Brain,* 121 (1998): 1951-1973.

[263] Stanley B. Klein, Judith Loftus, and John F. Kihlstrom, "Memory and Temporal Experience: The Effects of Episodic Memory Loss on an Amnesic Patient's Ability to Remember the Past and Imagine the Future," *Social Cognition*, 20, 5 (2002): 353-379.

long-distance telephone call". K.C. can draw the outlines of North America and the Statue of Liberty. He can even tell you the year his family moved to their current residence, where he went to school, and where he spent his summers as a teen.[264] K.C. can go about his daily life in such a way as to be able to fool an "uniformed observer into overlooking his complete loss of episodic memory function." He has no trouble, for example, finding breakfast cereal and the proper eating utensil in his kitchen. He knows which ball to sink last to win a game of pool. He can "explain the difference between a strike and spare in bowling, and between the front crawl and breast stroke." K.C. can even describe the layout of his current home and summer cottage, "and the shortest route between them".[265] Like K.C., M.L. performed well on "most neuropsychological tests". According to Levine and his colleagues, his performance on "standard clinical and experimental measures of recall and recognition tasks" was normal."[266] For his part, D.B. was "alert and cooperative" upon examination. He displayed knowledge of a "variety of facts about public figures and events." D.B. is able to give accurate information about "a number of issues" from current concerns about unemployment and housing to environmental degradation and overpopulation. He could also provide the "name of the company where he had worked and the nature of its

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[264] Tulving, "Memory and Consciousness," 4.

[265] Rosenbaum et al., "The Case of K.C.," 994.

[266] Levine et al., "Episodic Memory and the Self in a Case of Isolated Retrograde Amnesia," 1967.

business."[267] D.B.'s speech was "fluent" and his "general level of intelligence" appeared to be preserved. Like K.C. and M.L., D.B.'s knowledge of "word meanings was intact, as was his ability to understand and respond to questions."[268]

With regard to their cognitive deficits, all three exhibit severely impoverished memory for their personal pasts. K.C.'s "amnesia for personal events is profound. It covers the time both before and after his accident."[269] In fact, during extensive testing, K.C. "could not produce a single episode from his past that was distinct in time and place."[270] This "inability to recollect any specific event in which he himself participated or any happening that he himself witnessed" is what makes him "different, even from many amnesic cases".[271] It seems, according to Tulving, that K.C.'s sense of his own past has "the same impersonal experiential quality as his knowledge of the rest of the world."[272] Levine and his colleagues also reported this kind of mnemonic deficit in M.L. His "own recollections of post-injury events...lacks the subjective quality characteristic of normal episodic recall of events integrated within the fabric of one's self and one's past."[273] Sim-

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[267] Klein et al., "Memory and Temporal Experience," 359.

[268] Ibid.

[269] Tulving, "Memory and Consciousness," 4.

[270] Rosenbaum et al., "The Case of K.C.," 997.

[271] Ibid., 994.

[272] Tulving, ""Memory and Consciousness," 4.

[273] Levine et al., "Episodic Memory and the Self in a Case of Isolated Retrograde Amnesia," 1968.

ilarly, D.B. demonstrated "profound difficulty remembering personal events."[274] During various rounds of both "[i]nformal questioning and psychological testing," D.B. was "unable to consciously bring to mind a single thing he had done or experienced before his heart attack."[275] In fact, when asked about his decades long career in business, he "could not recall a single occasion when he was at work, or a single event that occurred there."[276] These clinical observations of K.C., M.L., and D.B. provide important corroborating evidence for the basic distinction Tulving formulated between semantic and episodic memory. The former is about general facts and information while the latter is about personal events. Thus, although each patient "*knows* a great deal about the world" because he learned it before the onset of his amnesia, none of the men "*remember* anything from the same period in his life (or any other period)." In this way, the brain damage suffered by each of these patients is remarkably selective. The neurological injury "must have greatly impaired operations of one while leaving the other largely intact."[277] According to Tulving, and important for the discussion in the next chapter, this "striking disassociation suggests that episodic and semantic memory are subserved by at least partially distinct sets of neural mechanisms."[278]

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[274] Klein et al., "Memory and Temporal Experience," 359.

[275] Ibid.

[276] Ibid.

[277] Tulving, "Episodic Memory and Autonoesis," 24.

[278] Ibid.

The clinical reports of K.C., M.L., and D.B. also found that the pronounced deficits for episodic memory paralleled serious deficiencies in the patients' abilities to understand themselves as enfolded, or unfolding, in time. This is entirely consistent with Tulving's integrative hypothesis. While Tulving advanced the important distinction between chronological and subjective time, Klein and his colleagues

> refer to the experience of time associated with semantic memory as *known time* to distinguish it from the experience of *lived time* made possible by episodic memory. It is the distinction between thinking about time as an objective chronology and thinking about time as an unfolding of personal happenings centered about the self.[279]

Each amnesic patient shows some aptitude for and understanding of known time while revealing very little if any comprehension of lived time. K.C. clearly understands "the units of time and their relations perfectly well, and he can accurately represent chronological time graphically."[280] However, while the time in his life defined by "hurrying to work without breakfast after sleeping in, socializing in bars over card games, membership in a rock band, trips to Mardi Gras, and motorcycle rides remains familiar, there is no trace of personal recollection of any episode."[281] In this sense, K.C.'s knowledge "about his past is functionally in the same category as his knowledge of other people's past."[282] Similarly, it was reported by Klein and his colleagues that D.B. exhibited a "relative sparing of the

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[279] Klein et al., "Memory and Temporal Experience," 357.

[280] Tulving, "Memory and Consciousness," 4.

[281] Rosenbaum et al., "The Case of K.C.," 993.

[282] Ibid.

known past" alongside a near total "loss of the lived past."[283] He is simply "incapable of remembering events that transpired only moments earlier."[284] Any subjective sense of their own lived time has disappeared for these amnesic patients. A fundamental interaction between episodic memory and subjective time has been interrupted. It is presumed that this has had a profound effect on the patients' self-understanding. As Klein explains, a sense of having a 'self' is predicated on being able to subjectively link time and memory. That is, "the act of remembering logically presupposes a sense of time," but "our subjective experience of time is held to be a construction of memory."[285] These men are no longer able to maintain and reconstruct a continuous self. "Now 51 years old, details of personal occurrences continue to exist only in the present, vanishing from K.C.'s reality the moment his thoughts are directed elsewhere."[286] What has been widely reported about H.M., also holds true for these three amnesic men as well. "His intelligence was intact...but he was confined to living in the moment because the

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[283] Klein et al., "Memory and Temporal Experience," 369.

[284] Ibid., 359.

[285] Ibid.

[286] Rosenbaum et al., "The Case of K.C.," 994.

present disappeared into the past without a trace."[287] K.C., M.L., and D.B. all live in "a time-less world - that is in a permanent present".[288] Without the ability to access what has come before, their current existence is temporally narrow and thoroughly circumscribed.

The triad necessary for achieving autobiographical memory - mental time travel, episodic memory, and autonoetic consciousness - has unraveled for K.C., M.L., and D.B.[289] When chronesthesia is called for, K.C. falters. For instance, when asked "what he did before coming to where he is now, or what he did the day before," K.C. says that he does not know. "When asked what he will be doing when he leaves 'here,' or what he will be doing 'tomorrow,' he says he does not know."[290] K.C. is simply "unable to...relive a personal episodic past or invent pos-

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[287] Davachi and Danker, "Cognitive Neuroscience of Episodic Memory," 376. Ochsner and Kosslyn write: "When Henry awoke after his operation, the epilepsy was gone, but so was his ability to form new memories of events he experienced. Henry was stuck in the eternal present, forevermore awakening each day with his sense of time frozen at the age at which he had the operation. The time horizon for his experience was about two minutes, or the amount of time information could be retained in short-term memory before it required transfer to a longer-term episodic memory store." Ochsner and Kosslyn, "Introduction: Cognitive Neuroscience - Where Are We Now?," in *The Oxford Handbook of Cognitive Neuroscience*. eds. Kevin N. Ochsner, Stephen M. Kosslyn, (New York: Oxford University Press, 2014), 4.

[288] Tulving, "Chronesthesia," 317-318.

[289] Ibid., "[K.C.] knows and can talk about what most other people know about physical time, its units, its structure, and its measurements by clocks and calendars. But such knowledge of time in an of itself does not allow him to remember events as having happened at a particular time. It is necessary but not sufficient. Something else is needed, and this something else - the awareness of time in which one's experiences are recorded - seems to be missing from K.C.'s neurocognitive profile. He thus exhibits a disassociation between knowing time and experiencing time, a disassociation that parallels one between knowing the facts of the world and remembering past experiences." 318.

[290] Tulving, "Memory and Consciousness," 4.

sible future events in which he might participate."[291] D.B. is similarly impaired. He has difficulty "remembering his personal past" which, Klein and his colleagues report, directly parallels his "severe difficultly imagining what his experiences might be like in the future."[292] When specifically asked to imagine the future, D.B. falters. The task is entirely beyond him. According to Klein and his colleagues, D.B. represents "the first demonstration that neuropsychological dissociations between memory for the lived and known past also may extend to the ability to anticipate the future."[293] Recognizing the extent to which D.B.'s amnesic condition impacts his ability to imagine his future is the "novel contribution" of his case to the science of memory.[294] Some amnesiacs therefore demonstrate that evolution's tricky temporality can circumvent itself in another direction as well: mentally summersaulting us forward in time. Neuropsychologically speaking, before patients like K.C., D.B., and M.L., it was possible to claim that "remembered time might be functionally different from the imagined future time, and that the two might even be subserved by by different neural substrates."[295] But now, memory

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[291] Rosenbaum et al., "The Case of K.C.," 993.

[292] Klein et al., "Memory and Temporal Experience," 369.

[293] Ibid.

[294] Tulving has referred to the specific temporal experience D.B. lacks as "proscopic (forward-looking, forward-oriented) chronesthesia," "Chronesthesia," 311 or that ability normal, healthy individuals have for "imagining (preexperiencing) personal happenings in the subjectively felt future." "Episodic Memory and Autonoesis," 47. The clinical analysis of D.B., and others like him, has therefore compelled Tulving to rethink his original insight about mental time travel. Chronesthesia, the trick of evolution by which lived time loops back and compresses upon itself, is "most common and familiar" during instances when we remember happenings from our own life, or when we think "back to past events and situations". "Chronesthesia," 314

[295] Tulving, Episodic Memory and Autonoesis," 28.

scientists recognize and affirm the lessons learned from these clinical reports: disruptions to the episodic memory system effect our ability to remember the past *and* imagine the future.[296]

Without diminishing the tragic nature of these three cases, it has to be acknowledged that K.C., M.L., D.B., and others like them, have greatly benefited the scientific study of memory.[297] The complexities of a normal, healthy brain are clarified when investigators pay close attention to how and why the brain fails to function properly. But again, as important as this evidence may be, case studies should not be considered in isolation. A fuller understanding of the relationship between autonoesis, chronesthesia, and episodic memory will only be achieved when investigators also draw on new theoretical models, updated psychological experimentation, additional subjective reports, and current neuroimaging techniques. All evidence should be considered and weighed in conjunction with the models and merits of projects like those detailed above.

Considering that K.C., M.L., and D.B. are no longer able to travel mentally through time, in either direction, and considering how these patients are no longer able to retrieve any personal episodes from their own lives, one can rea-

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[296] "It was this striking pattern of K.C.'s mental life - his largely conscious thoughts about the impersonal world contrasted with his essentially nonexistent conscious thoughts about his own past and future - that first suggested the distinction between noetic and autonoetic consciousness." Tulving, "Chronesthsia," 7

[297] Of Henry Molaison, Corkin writes: "His memory loss, while having a devastating impact on his daily life, proved a priceless gain in the quest for the underpinnings of learning and memory." *Permanent Present Tense*, 50.

sonably argue that these individuals are "without autonoetic consciousness."[298] This is a strong claim, but the clinical evidence supports it. In the estimation of Levine and his colleagues, while M.L. may have retained "some residual autonoetic awareness," it only operates "on post-injury information, and even there less efficiently than control subjects."[299] In K.C.'s case, he clearly knows what the word 'consciousness' means. When asked, he says that it means "being aware of who we are and what we are, and where we are."[300] However, as the following exchange and commentary make clear,[301] K.C. is no longer autonoetically conscious himself.

> E.T. "Let's try the question again about the future. What will you be doing tomorrow?"
> (There is a 15-second pause.)
> K.C. smiles faintly, then says, "I don't know."
> E.T.: "Do you remember the question?"
> K.C.: "About what I'll be doing tomorrow?"
> E.T.: "Yes. How would you describe your state of mind when you try to think about it?"

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[298] Tulving, "Memory and Consciousness," 4. and Levine et al., "Episodic Memory and the Self in a Case of Isolated Retrograde Amnesia,"`1969. Tulving offers this description of autonoetic consciousness. "Autonoetic consciousness has a more recent origin in evolution and is more advanced than noetic, because in addition to allowing people to know what happened in the past it also allows them to re-experience past experiences. Autonoetic awareness accompanies retrieval of information about one's personal past as well as projection of one's thoughts into the future. When individuals remember the past, they are autonoetically aware of what they did or thought at an earlier time, and they are also aware of such awareness. Thus, autonoetic consciousness includes but transcends noetic consciousness." "Chronethesia," 3-4.

[299] Levine et al., "Episodic Memory and the Self in a Case of Isolated Retrograde Amnesia," 1969.

[300] Tulving, "Memory and Consciousness," 4.

[301] This is an excerpt from a longer interview Tulving conducted with K.C. As indicated above, in this article K.C. is referred to as N.N. To avoid confusion I will use the initials K.C. rather than N.N. E.T. refers to the interviewer/author, Endel Tulving.

> (A 5-second pause.)
> K.C.: “Blank, I guess.”

Tulving elaborates.

> When asked, on different occasions, to describe the ‘blankness’ that characterizes his state of mind when he tries to think about ‘tomorrow,’ he says that it is ‘like being asleep’ or that ‘it’s a big blankness sort of thing.’ When asked to give an analogy, to describe what it’s like, he says, ‘It’s like being in a room with nothing there and have a guy tells you to go find a chair, and there’s nothing there.’ On another occasion he says, ‘It’s like swimming in the middle of a lake. There’s nothing there to hold you up or do anything with.’ When asked to compare his state of mind when he is trying to think about what he will be doing tomorrow with his state of mind when he thinks about what he did yesterday, he says it is the ‘same kind of blankness.’ [K.C.] makes all these observations calmly and serenely, without showing any emotion. Only when he is asked whether he is not surprised that there is ‘nothing there’ when he tries to think about yesterday or tomorrow, does he display slight agitation for a moment and utter a soft exclamation of ‘Wow!’[302]

The inability to experience any proprietary feeling for, or otherwise subjective grasp of, one’s own lived time, as indicated by his mental ‘blankness,’ reveals K.C.’s utter loss of autonoetic consciousness. For Tulving, a “normal healthy person who possess autonoetic consciousness is capable of becoming aware of her own past as well as her own future; she is capable of mental time travel, roaming at will over what has happened as readily as over what might happen, independently of physical laws that govern the universe.”[303] Without this ability to mentally roam free, the subjective landscapes of K.C., M.L., and D.B. are largely foreclosed. The necessary, reciprocal influences of a sense of one’s own lived time and an autonoetic self have been disrupted by amnesia. According to Sudden-

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[302] Tulving, “Memory and Consciousness,” 4.

[303] Ibid., 5.

dorf and Corballis, the relationship between the two is bidirectional. “On the one hand, in providing autobiographical information about one’s own past, episodic memories may be said to provide the basis for personal identity. On the other hand, one may also need an awareness of self in the present in order to be able to relate memory representations to experiences of one’s self in the past.”[304] For K.C., M.L., and D.B., their awareness of a personal identity has slipped away. Recalling yesterday’s events is impossible, such episodes will no longer be assimilable in the present and thus forever lost to oblivion. Without an ability to consciously integrate yesterday, today, and tomorrow, a subjective experience of time fails. It is devoid of any meaningful content or personal feeling. Time will continuing to unfold and these amnesic patients will continue to be physically enfolded within its flow like the rest of us, but they will not know it. Without episodic memory K.C., M.L., and D.B. no longer have a way to keep track of what has come before. They no longer have a way to imagine what might happen next. Neither the lived past nor an imagined future survives the exigencies of the present moment. Simply, sadly, their lives have become unnaturally thin, a narrow present becomes them.

Our ability to mentally travel through time is unprecedented in nature. This natural width has allowed the human animal to anticipate numerous problems

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[304] T. Suddendorf, T. and M.C. Corballis, “Mental Time Travel and the Evolution of the Human Mind,” *Genetic and Social General Psychology Monographs*, 123 (1997): 133-167.

and to even mitigate the inherent unpredictability of the natural world.[305] Through our capacity for chronesthesia, humans beings, as far as we know,

> are the only animals who have ever used a different, much more efficacious, solution to the problem of the fit between the species and its ecological niche: at some point in their evolutionary history, thousands of years ago, they discovered that they did not have to adapt to every feature of the world, and that one way of dealing with the physical environment was to change it to fit them. Other species exist that have used the same strategy for isolated purposes; humans learned to do it on a grand scale.[306]

This has allowed humans "to create a world to fit them, rather than live in one into which they had to fit."[307] And the "changes they have wrought on the natural world are staggering in scope and sophistication."[308] Currently, Tulving hypothesizes that proscopic chronesthesia has been, and will continue to be, a crucial "'driver' of human cultural evolution."[309] We will return, in the final chapter, to fully elaborate the broader religious implications of this evolutionary account of chronesthesia. We will consider what this ability to experience oneself as temporally extended means - and not simply by being able to look back into a past already lived through, but also by looking ahead to envision a future yet to be lived out. However, before we can properly assess the subjective relevances of our tempo-

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[305] Tulving, "Episodic Memory and Autonoesis," 20.

[306] Tulving, "Chronesthesia," 321.

[307] Tulving, "Episodic Memory and Autonoesis," 22.

[308] Tulving, "Chronesthesia," 321

[309] Ibid., 322.

ral experiences, we must continue our objective, evolutionary account into the natural depth structures of episodic memory.

## *Chapter 3*
## *Memory's Natural Depth: Cognitive Neuroscientific Glimpses into Remembering Brains*

In the past few decades various scientific disciplines have sought to understand memory from increasingly lower levels of biological organization. Preoccupied by Tulving's triad, and its relevance for our subjective experience of time, the previous chapter remained firmly beholden to memory science at the neuropsychological and behavioral levels. In this chapter we endeavor to go deeper. We will attend to studies concerned with neuroanatomy and the molecular and cellular mechanisms of episodic memory.[310] Within the cognitive neurosciences, neuroanatomical discoveries have relied a great deal on neuroimaging techniques.[311] Evidence generated by advanced imaging technology has helped to identify the relevant structures of the brain thought to support higher order

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[310] Bickle argues that learning and memory are "unique among cognitive functions" in that the "neurobiological building blocks of their mechanistic explanations are obvious." Currently, these well established foundations of memory, in Bickle's view, much like the perspective of Squire and Kandel, allow neuroscientists to "move quickly up and down from this anchor: up to neural regions, systems, and behavior, and down to molecular biology and biochemistry." "Memory and Neurophilosophy," 210.

[311] Kevin N. Ochsner and Stephen M. Kosslyn argue that the impact of these techniques cannot be overstated. "The advent of functional imaging is in many ways the single most important contributor to the rise of cognitive neuroscience. Without the ability to study cortical and subcortical brain systems in action in healthy adults, it's not clear whether cognitive neuroscience would have become the central paradigm that it is today." "Introduction to The Oxford Handbook of Cognitive Neuroscience. Cognitive Neuroscience - Where Are We Now?," 3.

cognitive functions such as memory.[312] The first section of this chapter will deal with some of the data which uncover the central neurological areas enabling our capacities for episodic memory, chronethesia, and autonoesis. The second section has an even finer focus. It will deal with contemporary neurobiological research into the most basic foundations of memory as pursued by Howard Eichenbaum, Alcino J. Silva, Eric Kandel, and others. This impressive research has identified the cellular and molecular mechanisms undergirding long-term declarative memories. When the biological foundations of memory are better understood we will be in a position to fully appreciate the implications of an assertion made by Larry Squire and Eric Kandel: "Memory promises to be the first mental faculty to be understandable in a language that makes a bridge from molecules to mind, that is, from molecules to cells, to brain systems, and to behavior."[313]

"*What is it about memory that inevitably brings in the physiological?"* [314]

Certainly among the cognoscenti of memory there have been the high-minded - those whose engagements with mnemonic phenomena remain either

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[312] However, as critics are correct to point out, brain images can be flawed and even oversold to an untrained public. It is therefore incumbent on all intellectual stake holders to heed "a cautionary note: Functional imaging is by no means the be-all and end-all of cognitive neuroscience techniques. Like any other method, it has its own strengths and weaknesses". Ochsner and Kosslyn, 3. There is, in fact, a burgeoning 'movement' of scholars and researchers endeavoring to critically sharpen neuroscientific inquires. See *Critical Neuroscience: A Handbook of the Social and Cultural Contexts of Neuroscience.* eds. Suparna Choudhury and Jan Slaby, (Chichester, West Sussex: Wiley-Blackwell, 2012)

[313] Squire, Larry R., Kandel, Eric R., *Memory: From Mind to Molecules,* (New York, NY: Scientific American Library, 2000), 3.

[314] Warnock, *Memory*, p. 1.

allergic to considerations of body and biology, treating these material realms as literally or figuratively beneath them, or those who are apathetic to discussions of memory from low levels of analysis, judging such specialized details and discourses superfluous to the more vital task of articulating what is really important about the ways and means of human remembering.[315] Warnock was neither allergic nor apathetic. She frequently encouraged her readers to be mindful of the brain - whether it be the brain of a flatworm, an octopus, a human being, or, as we'll see, a giant sea snail or a mouse. According to Warnock, "anyone writing about memory is bound to write about the brain, which is part of the body, as well as about the mind." In this respect writing about memory is unique. It is "perfectly possible to write about decision making, or imagination, or the nature of humour, all of them in some sense mental phenomena, without discussing or even men-

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[315] With regard to the phenomenologists of memory we discussed in the previous chapter, we should recognize that the apathetic/allergic divide is an imperfect fit. Casey's work pays considerable attention to the embodied nature of mnemonic phenomena. However, he completely ignores any biological accounts of memory as generated by contemporary memory scientists. This total non-engagement with contemporary memory science is also true of Sven Bernecker's *Memory: A Philosophical Study*. (New York: Oxford University Press, 2010). Ricoeur, on the other hand, is well aware of contemporary neuroscientific inquires into mnemonic phenomena. See, for example, the published extended conversation with Jean-Pierre Changeux *What Makes us Think: A Neuroscientist and a Philosophy Argue about Ethics, Human Nature, and the Brain*. trans. M.B. DeBevoise, (Princeton, NJ: Princeton University Press, 2000). However, Ricoeur does not directly engage any scientific research projects. Instead, he merely announces that none of his philosophical renderings about memory, history, and forgetting in any way contradict contemporary neuroscience. John Sutton's *Philosophy and Memory Traces: Descartes to Connectionism* is an enlightening effort to excavate the early expressions of memory science since Descartes. For his part, Krell does engage with some contemporary memory science. His dealings, however, are largely adversarial. He is highly suspicious of the claims and interpretations made by the psychological sciences. In fact, Krell acknowledges that the initial idea for the book that eventually became *Of Memory, Reminiscence, and Writing* was to be "the failure of neurophysiological research to render plausible accounts of long-term memory," xi. This initial germ morphed into an entirely different project. Nevertheless, remnants of his fundamental distrust of the science of memory surface throughout his text. See, for instance, 85-90.

tioning the brain. What is it about memory that inevitably brings in the physiological?"[316]

Warnock's own response this to paradigmatic question begins by observing animals. It is common for people to speak about animals, especially our "favoured domestic animals," as "deciding, thinking," or "being sad or finding things funny." Such anthropomorphisms betray more than "a hint of metaphor," according to Warnock. In the case of memory, however, "there is no such hint. In saying that animals remember, we are saying something perfectly acceptable. We are not necessarily ascribing to them an inner life like our own". It is also commonly agreed that "we can teach, or train, animals; and if we teach these animals successfully, they learn, and learning entails memory."[317] But, we must be clear, it is not just us our cats and dogs who remember in this way. Even "quite lowly animals (or so we class them) like flatworms and octopuses can learn from experience."[318] It is reasonable to conclude, then, that the "particular function of the brain is…to receive and retain experiences" and that the "brains of all animals have this same function."[319] For Warnock, memory is unequivocally "a part of nature" and this "neurophysiological phenomenon" has played "a crucial role in the survival of the animal."[320]

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[316] Warnock, *Memory*, 1.

[317] Ibid.

[318] Ibid., 1, 14, 134.

[319] Ibid., 28.

[320] Ibid.

Certainly, Tulving agrees. His original litany announced that 'Memory is a gift of nature, the ability of living organisms to retain and utilize acquired information or knowledge.' Trouble arises, however, when memory scientists look closely at what appears to be a discontinuity between the species with regard to memory. Human memory in general and episodic memory in particular seem to be an entirely different animal, unique to us. Proponents interested in delineating an evolutionary continuity with respect to episodic memory point to common neurological architectures and mechanistic processes that exist across a wide variety of species. Much of this neurological architecture remained elusive and hidden until very recently. In fact, Tulving was referring to human memory when he called it a "biological abstraction," apparently uncertain about the physiological status of nature's ubiquitous gift.[321] Both Warnock and Tulving presume the biological basis of memory. However, they still had to struggle with certain ontological ambiguities not only about what memories are but from whence they come.

It took years for the cognitive neuroscience of memory to craft a more specific rendering of mnemonic physiology. Daniel Schacter acknowledges this history. "For many decades neuroscientists searched for the brain location of the engram - a term for the persisting aftereffects of experience in the nervous system," yet "the search for a single location in the brain that corresponds to a

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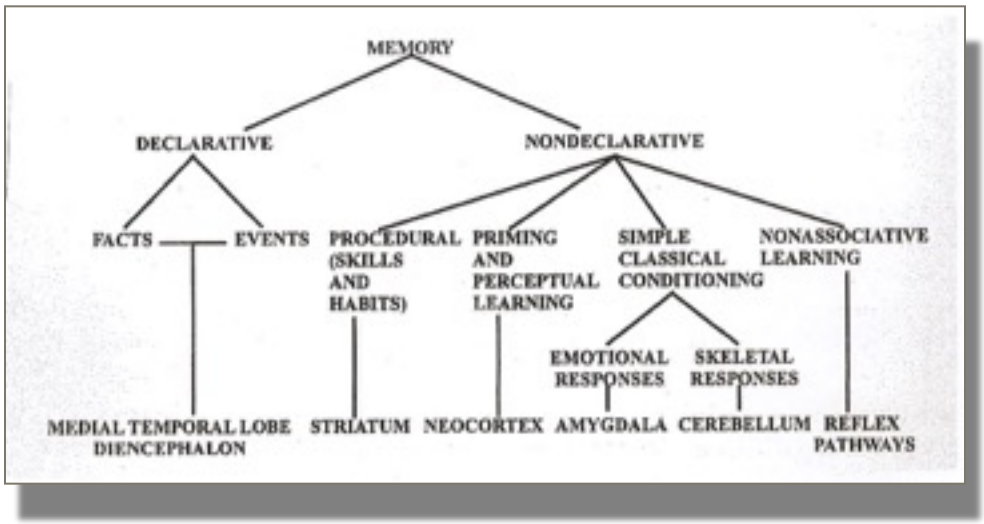
[321] In the first edition of *The Cognitive Neurosciences,* Tulving wrote about the abstract nature of memory. "There is no place in the brain that one could point at and say, Here is memory. There is no single activity, or class of activities, of the organism that could be identified with the concept that the term denotes. There is no known molecular change that corresponds to memory, no known cellular activity that represents memory, no behavioral response of a living organism that is memory. Yet the term memory encompasses all these changes and activities." 751.

memory never succeeded".[322] As Karl Lashley famously wrote near the end of his career-long search for the engram: "I sometimes feel, in reviewing the evidence on the localization of the memory trace, that the necessary conclusion is that learning is just not possible."[323] Of course, remembering and learning occur. The difficulty Lashley, and many others, faced head-on was an anatomical one - empirically verifying the precise location/s of memory in the brain. The difficult search continues today.

In contemporary memory science, the physiology of memory, its neurological activations and biological changes, is much better understood.[324] Schacter explains that researchers have made considerable progress because they no longer chase after the engram in only one neurological place. Neither will they claim that episodic memories are the product of only one neurological process or mechanism. Instead, memory is

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[322] Daniel Schacter, "Introduction," in *The Cognitive Neurosciences III*. ed. Michael S. Gazzaniga, (Cambridge, MA: MIT Press, 2004), 643-644.

[323] Karl S. Lashley, "In Search of the Engram," *Symposia of the Society for Experimental Biology* 4, (1950): 454-482.

[324] The figure is Squire's memory taxonomy with neurological associations. *Science of Memory*, 341.

currently approached as a “nonunitary entity”.[325] This unconventional label captures the sense that “most memory researchers would agree that there is some sort of an engram - a stored representation of experience in the brain - but few would maintain that it is in a single location, or that there is any one place in the brain that one could point to as the site of a particular memory.”[326] Years of neuropsychological study, greatly enhanced by recent advances in functional imaging technology, have rendered memory less biologically abstract, in certain respects, and more complex in others. Memory scientists since Lashley have charted a complex physiological terrain to locate the neurological sources of and processes behind our personal memories. Becoming familiar with some of this neurological landscape will necessitate that we contend with recent neuroimaging studies. Specifically, fMRI techniques have demonstrated that a consistent

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[325] Schacter, “Introduction,” 643.

[326] Ibid., 643-644. The designation is a direct repudiation of overconfident and oversimplified brain mapping endeavors predicated on phrenological fallacies of simple location and functionally encapsulated modularity. The notion that there is a simple one-to-one relationship between neuroanatomy and a cognitive faculty is the problematic legacy of Franz Joseph Gall and his followers. As the recognized founder of phrenological analysis, Gall is an interesting figure in the history of science - innovative, polemical. Particularly off-putting have been the misogynistic and racist applications of Gall’s work. Kandel offers this concise summary of the origins of Gall’s approach. “He believed that each area of the cerebral cortex grew with usage and that this growth caused the overlying skull to protrude. Gall developed his idea in stages, beginning when he was young. In school, he had formed the impression that his most intelligent classmates had prominent foreheads and eyes. In contrast, a very romantic and enchanting widow he encountered had a prominent back of the head. Thus, Gall came to believe that great intelligence creates greater mass in the front of the brain, whereas great romantic passion produces greater mass in the back. In each case the overlying skull was enlarged by growth of the brain. Gall believed that by examining the bumps and ridges of the skulls of people we endowed with specific faculties, he could identify the centers of those faculties.” Kandel, *In Search of Memory*, 119. As any cursory search of the internet will show, images of Gall’s map of the brain are well known. Moreover, his modular map of the brain has been refashioned in various corners of the popular imagination. For an in-depth philosophical discussion of the legacy of Gall’s phrenological approach to the brain as it persists within contemporary research contexts see William Uttal’s *The New Phrenology: The Limits of Localizing Cognitive Processes in the Brain*. (Cambridge, MA : MIT Press, 2001)

set of neuroanatomical structures are relevant to the creation and maintenance of episodic memory, chronethesia, and autonoesis. These studies provide another layer of support for fundamental aspects of Tulving's work. By the end of this section we will have a clearer sense for why an increasing number of memory scientists refer to a consortium of neuroanatomical structures as the "'core' autobiographical memory network".[327] It appears that an interactive assemblage of neurological structures enable "our recollection of times past, imagination, and our attempts to predict the future."[328]

### *I. The Core Network*

Our discussion of the core network begins with two relatively recent reviews of this accumulating evidence.[329] Neither review explicitly names episodic memory, chronesthesia, and autonoesis as its primary foci. However, without using these precise terms, it is clear that both articles have these capacities in mind. Eleanor Maguire, for instance, states that her focus is on studies of "the retrieval of autobiographical event memories". She explains that by autobiographical event memories she means "those personally relevant episodes with a specific spacio-temporal context, the storehouse of our life's experiences ranging

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[327] Eva Svoboda, Margaret C. McKinnon, and Brian Levine, "The Functional Neuroanatomy of Autobiographical Memory: A Meta-Analysis" *Neuropsychologia* 44.12 (2006): 2189-2208, 2193.

[328] Sinead L. Mullally and Eleanor A. Maguire, "Prediction, Imagination, and Memory," in *The Cognitive Neurosciences*. eds. Michael S. Gazzaniga and George R. Mangun, Fifth edition. (Cambridge, MA: MIT Press, 2014), 605

[329] Eleanor A. Maguire, "Neuroimaging Studies of Autobiographical Event Memory". *Philosophical Transactions: Biological Sciences* 356.1413 (2001): 1441–1451 and Svoboda, et al., "The Functional Neuroanatomy of Autobiographical Memory: A Meta-Analysis," 2189-2208.

from the recent to the very remote."[330] Similarly, the review by Eva Svoboda, Margaret McKinnon, and Brian Levine is concerned with "autobiographical memory (AM)." According to their review, autobiographical memories are not like "typical laboratory memory tasks that require the encoding and retrieval of experimenter-generated stimuli" because participants in AM studies must "recall events from their own history that are more distinct and of greater personal significance than are laboratory stimuli."[331] Studies of AM are therefore interested in the "subjective re-experiencing of emotions, sensory characteristics and temporal, spacial, and perceptual context of events."[332] Autobiographical memories, or autobiographical event memories, then, are precisely the kinds of phenomena Tulving's triad encompasses.

Before we turn to their findings, its should be noted that Maguire's review systematically analyzes data from eleven different experiments, including studies incorporating PET and fMRI techniques while Svoboda and her colleagues collate the findings of twenty-four different fMRI studies. Both reviews spend considerable time delineating the methodological advantages and disadvantages of using neuroimagining techniques to study memory in general, including the

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[330] Maguire, "Neuroimaging Studies of Autobiographical Event Memory," 1441.

[331] Svoboda, et al., "The Functional Neuroanatomy of Autobiographical Memory: A Meta-Analysis," 2190.

[332] Ibid.

unique challenges to studying autobiographical memory in particular.[333] While this content is extremely important, many of its details are not directly relevant to our present purposes. These reviews are particularly strong for at least two reasons, however. First, consistent with Schacter's notion of a nonunitary entity, both recognize that autobiographical memories are "multi-modal" in nature which means that AM engages "several functional domains" at once. It is therefore difficult for any "single imaging study" to "capture the entire network involved in autobiographical recollection."[334] What imaging studies *can* do very well is, first, identify the "structural patterns of brain activation" and, second, "examine the influence of task variables on this pattern".[335] Functional imaging therefore helps to clarify the locations and patterns of this nonunitary entity while participants' brains are being scanned during the rehearsal of autobiographical episodes. Second, the neuroimaging evidence rehearsed in these reviews supports what Schacter identified as a "general consensus" among working cognitive neuroscientists. He maintains that most memory scientists agree that "engrams consist of multiple features," are "likely distributed across several brain locations," and are "bound together by

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[333] Scientists who study autobiographical memory face a number of particular challenges. These difficulties, or as Eleanor Maguire calls them "experimental variables," arise at every phase of the memory process from encoding to retrieval. Maguire provides a litany of factors to consider when studying autobiographical memory. The variables around encoding, for instance, include: "novelty of event," "its distinctiveness," "its predictability," "the number and types of sensory modalities involved," "cognitive and emotional significance of events," and "the exposure duration and repetition profile". With regard to 'retention variables,' Maguire identifies considerations such as "time from event to test," "sensitivity of the testing measure," "response modality," and "strategies used by the subject," 1442.

[334] Svoboda et al, "The Functional Neuroanatomy of Autobiographical Memory," 2190.

[335] Ibid., 2190.

the hippocampus and related structures in the medial temporal lobe [MTL]."[336] The credibility of this consensus view actually rests squarely on findings from studies like those reviewed by Maguire and Svoboda, McKinnon, and Levine. As we will see, both reviews helpfully elaborate Schacter's assessments and clearly indicate where this research requires additional evidence.

Reference to "a 'core' AM network" is explicitly made by Svboda and her colleagues.[337] Their meta-analysis found that a "consistent network of regions" was activated during tests of autobiographical memory which include "the medial and ventrolateral prefrontal cortices, medial and lateral temporal cortices, temporoparietal junctions, retrosplenial/posterior cingulate cortex, and the cerebellum."[338] These regions are the neurological structures from whence our remembrances of the past and our imaginings about the future come. Maguire also identified these same neurological structures in her review.[339] A complete, functional breakdown of the entire core network will not be attempted here.[340] Instead, our interest in Tulving's work will permit us to focus on specific activation patterns in those locations of the brain believed to be particularly relevant to autonoesis, chronesthesia, and episodic memory. This focus will also allow us to cross refer-

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[336] Schacter, "Introduction," 643-644.

[337] Svoboda, et al., "The Functional Neuroanatomy of Autobiographical Memory," 2193.

[338] Ibid.

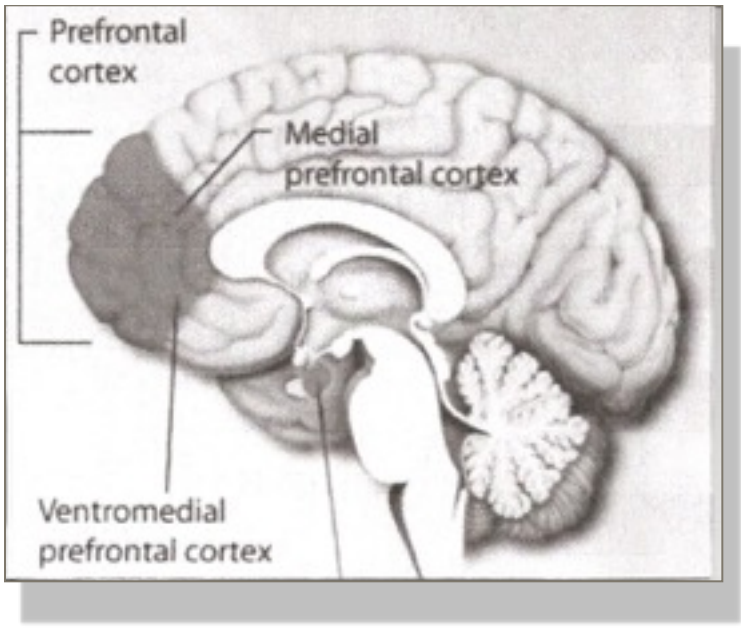
[339] Ibid.

[340] Svoboda and her colleagues actually reported on a core network which included three different groups of active neural regions. The secondary and tertiary regions were labeled as such because they were less frequently reported in the neuroimaging studies under consideration.

ence imaging evidence with the neuropsychological profiles of K.C., D.B., and M.L. discussed in the previous chapter.

*Prefrontal Cortex*

Looking at the neuroanatomy of the core AM network, we will concentrate on the medial temporal lobe and prefrontal cortices. The prefrontal cortex (PFC) is the cerebral cortex covering the front part of the frontal lobe.[341] Its various contributions to human cognition have been prodigiously studied and debated. Evolutionary explications of the origin of any higher order cognitive function, for instance, almost automatically begin here and frequently advocate a version of the especially large human brain theory citing our uniquely well endowed frontal lobe, relative to other species, as a primary neuroanatomical area of interest and efficacy.[342] With regard to the two reviews of the core network, PET and fMRI studies indicate that the




[341] Roughly Broadmann areas 9, 10, 11, 12, 46 and 47.

[342] According to Pasko Rakic, there is "no disagreement among neuroscientists that human cognitive abilities depend principally on the size and neuronal organization of the cerebral cortex." *The Cognitive Neurosciences III,* 3. For Todd M. Preuss, there is "ample reason to suspect that there is more to human brain evolution than just enlargement." It is true that "our brains are larger than those of other primates, and in some sense they must be better, too. But humans don't merely think better than other animals, we think differently." Ibid., 7. As Joaquin M. Fuster explains, comparisons of brain mass does not "provide more than a crude perspective of evolution in terms of neural function." *Cortex and Mind: Unifying Cognition.* (New York: Oxford University Press, 2003), 20.

PFC is “involved in numerous functions related to AM retrieval, chiefly, reconstructive mnemonic processes” and “self-referential processes.”[343] These two functions are centrally important to Tulving’s triad. Discussions of the prefrontal cortex during AM studies, specify that activation patterns are most evident in the ventrolateral prefrontal cortex (VLPFC) and the medial prefrontal cortex (mPFC).[344] Activations in the VLPFC are thought to be associated with acts of mnemonic reconstruction while activity in the mPFC has been correlated with self-referential processes.

Svoboda and her colleagues explain that mnemonic reconstruction is an executive type capacity “associated with strategic retrieval, verification, and selection of information from posterior cortical association areas”.[345] The VLPFC also shows activation “when participants are required to maintain search results online.”[346] These interrelated functional associations - the conscious search for a memory and the eventual strategic selection of relevant information from numer-

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[343] Svoboda et al., “The Functional Neuroanatomy of Autobiographical Memory,” 2195.

[344] The studies are show that these activation patterns tend to be left lateralized. According to research findings of the various functions of the frontal lobes, tests of autobiographical memory show left-lateralized activation either because these tests rely on verbal reports and/or because they depend on verbal experimental stimuli. See Svoboda et al, 2195 and Maquire, 1450. Activations within the VLPFC itself have been shown to vary depending on the stimulus employed. For example, according to Petrides and Pandya, “Functional neuroimaging studies are generally in agreement with the view that ventrolateral areas 44 and 45 differ in function. For instance, Paulesu et al. (1993), in a positron emission tomography study, have shown the involvement of area 44 in the processing of articulatory information. By contrast, Petrides et al. (1995) have provided evidence that area 45 has a role in the active retrieval of verbal information for memory.” in *Principles of Frontal Lobe Function,* 39.

[345] Svoboda et al.,“The Functional Neuroanatomy of Autobiographical Memory,” 2195.

[346] Ibid.

ous cortical storage sites - support major tenants of the capacities Tulving studies. Entirely consistent with what is known about frontal lobe function, the contributions of the VLPFC with regard for episodic memory are 1) to enable our conscious, or online, retrieval of autobiographical memories by 2) overseeing the reconstruction of previous episodes by borrowing mental content from any number of our stored sensory remnants as requisite building blocks for a memory. In other words, during acts of recollection, the encoded remnants of earlier experiences - sights, sounds, smells, sensations, etc - are gathered together by the VLPFC, literally re-collected, from various places across the cortex where they are believed to be stored long term.[347] And, as we saw in the previous chapter, Tulving explains that through our capacities for autonoesis and chronesthesia, we can, in the present moment, have an awareness of our past experiences when we evoke now (Time 2) what was encoded when we had the initial experi-

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[347] According the Kandel and Squire, the storage of long-term declarative memory in the brain is a highly communal affair. "There is no separate memory center where memories are permanently stored. Rather a long line of evidence shows that information storage follows a principle that is conserved across both vertebrates and invertebrates. Memory appears to be stored in the same distributed assembly of brain structures that are engaged in initially perceiving and processing what is to be remembered. …The brain regions in cortex that are involved in the perceiving and processing of color, size, shape, and other object attributes are close to, if not identical to, the brain regions important for remembering objects." *Memory: From Mind to Molecules,* 72-73. The prefrontal cortex functions, as part of its 'executive' responsibility, is to sift through and gather together the dispersed, cortically stored aspects of a to-be-remembered episode. There has been considerable debate about the role/s of prefrontal cortex. Currently, the prefrontal cortex is no longer understood as a robust executive. It is not a ruling monarch nor is the prefrontal cortex thought to be the situation room for our neurological commander-in-chief. According to Alan Baddeley, research on executive function and the frontal lobes has shown "1 That the executive is multicomponent; 2 That is depends largely, but almost certainly not exclusively, on the frontal lobes; 3 That this is a large and complex area of the brain that is almost certainly also responsible for other processes; and finally; 4 That executive processes are typically recruited in order to tackle non-routine situations that may call for different strategies at different times…" *Working Memory, Thought, and Action*. (Oxford: Oxford University Press, 2007), 203-204.

ence back then (Time 1). The VLPFC is a key component in this recollective process.[348]

The medial prefrontal cortex works in conjunction with the VLPFC. According to the reviews, the mPFC is "considered a key element of AM" because it has been consistently linked with "self-referential processing".[349] Self-referential processing, as the name suggests, is that formative process correlative with the inherent ownership we take for our autobiographical memories - the Jamesian 'warmth and intimacy' that makes episodic memories feel like our very own. Neuroimaging evidence supports this connection. For instance, when fMRI images of test subjects during episodic memory retrieval tasks were compared with activation patterns of tests subjects during semantic memory tasks, the "medial prefrontal activation was significantly greater in the episodic AM condition".[350] More recent studies have also corroborated this finding.[351] Macrae and his colleagues, for instance, in an articled entitled "A Self Less Ordinary: The Medial Prefrontal Cortex and You," conclude that "not only does activity in mPFC track with self-referential processing, it also contributes to the formation of self-relevant memories. In this respect, mPFC would appear to be a crucial component of the human

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[348] One convincing neuroanatomical model delineating how this re/constructive process actually unfolds in the brain and why it works to accomplish episodic recollection will be outlined in the next chapter when we discuss Davanchi and Danker's memory as reinstatement (MAR) model.

[349] Svoboda et al.,"The Functional Neuroanatomy of Autobiographical Memory," 2196.

[350] Ibid.

[351] See for example, K.K. Szpunar, J.M. Watson, and K.B. McDermott, "Neural substrates of envisioning the future," *Proceedings of the National Academy of Sciences USA* 104, (2007): 642–647. especially, 644-645.

memory system."[352] As was established in the previous chapter, key to the episodic memory system is our sense that we understand ourselves to be participants in what we remember e.g., taking a family vacation.[353] It has, after all, been Tulving's consistent insight that episodic memories are associated with one's personal involvement, that is, with an explicit claim to *remember* an experimental stimuli or past event rather than to *know* it on some other basis. And, as the case studies helped to establish, one major result of their amnesic condition is an impaired sense of themselves as personally involved in what they are able to remember. It seems, then, that Tulving's notion of autonoesis is rightly understood as a neurocognitive capacity enabled, at least in part, by activity within the prefrontal cortex.

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[352] Neil C. Macrae, Todd F. Heatherton, and William M. Kelley, "A Self Less Ordinary: The Medial Prefrontal Cortex and You," in *The Cognitive Neurosciences III,* 1067-1075.

[353] The relationship between self-referential processing and episodic memory has been tested more recently using neuroimaging techniques. See B. Levine, G.R. Turner, D.J. Tisserand, S.J. Hevenor, S.J. Graham, and A.R. McIntosh, "The Functional Neuroanatomy of Episodic and Semantic Autobiographical Remembering: A Prospective Functional fMRI Study," *Journal of Cognitive Neuroscience*, 16. 9 (2010), 1633-1646. In one particular experiment, these researchers sought to probe the neural correlates of the two states of consciousness near and dear to Tulving e.g., noetic/knowing consciousness and autonoetic/self-knowing consciousness, "by exposing participants to their own prospectively collected autobiographical and non-autobiographical audiotaped recordings." 1634. Methodologically speaking, the recordings are participant-generated stimuli. As such, they are truer to real life and therefore much less sterile than the experimenter-generated stimuli often used in typical laboratory settings. Levine and his colleagues instructed test participants to create audio recordings of "everyday events" for several days. These events included personal episodic happenings (PE), personal semantic activities (PS), and general semantic information (GS). Six to eight months later, the participants were invited to come to the testing facility for brain scans as their own audio recordings were played back to them. The participants were "scanned with functional magnetic resonance imaging (fMRI) while they listened to a random selection of these personal episodic (PE) recordings for the first time" and were also scanned while listening to personal semantic (PS), general semantic (GS), and other people's episodic (OE) recordings. The scans were then compare and the data showed, according to Levine and his colleagues, that the mPFC was active "in relation to personal (PE and PS) but not impersonal (OE and GS) material." 1644. This activation is consistent with the literature on self-reference and also coincides with Tulving's original neuropsychological insights, albeit with an additional neuroanatomical specificity.

Activation patterns within the prefrontal cortex are also thought to be associated with Tulving's notion of chronesthesia as well. In fact, he first elaborated his understanding of mental time travel in a contribution to a book called *Principles of Frontal Lobe Function.* In Tulving's chapter, "Chronesthesia: Conscious Awareness of Subjective Time," he "tentatively" defines chronesthesia "as a form of consciousness that allows individuals to think about the subjective time in which they live and that makes it possible for them to 'mentally travel' in such time."[354] Following Suddendorf and Corballis, Tulving's sense of the subjective time "not only covers the past; it also extends into the future."[355] The neuroimaging evidence indicates that chronesthesia, like autonoesis, is also associated with activation patterns in the prefrontal cortex.[356]

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[354] Tulving, "Chronesthesia," 312.

[355] Tulving, "Episodic Memory and Autonoesis: Uniquely Human?" 17. Suddendorf and Corballis, "Mental Time Travel and the Evolution of the Human Mind," 133-167. The proposals by Tulving and Suddendorf and Corballis, speculating on the evolutionary relevance of this capacious temporal reach of the human mind, will be discussed below.

[356] When Tulving first published his thoughts on mental time travel, he conceded that the "evidence supporting the postulated existence of chronesthesia is as yet scant, and what exists is largely indirect. Indeed, when relating the hypothetical ideas about chronesthesia to empirical facts, it would be pretentious to talk about evidence as such." "Chronesthesia", 316. Currently, the situation is much improved.

In the last decade and a half, numerous studies of chronesthesia have been conducted.[357] For example, the research team of Anne Botzung, Ekaterina Denkova, and Lilianne Manning published an article entitled "Experiencing Past and Future Personal Events: Functional Neuroimaging Evidence on the Neural Bases of Mental Time Travel," which details their use of functional imaging to identify "the network of brain regions specifically and conjointly activated during *re-experiencing* past events and *pre-experiencing* future events."[358] Their experiments were designed to identify a neurocognitive link "between mental time

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[357] For example see: Lars Nyberg, Alice S.N. Kim, Reza Habib, Brian Levine, and Endel Tulving, "Consciousness of Subjective Time in the Brain," *PNAS USA* 107. 51 (2010): 22356-22359; Anne Botzung, Ekaterina Denkova, and Lilianne Manning, "Experiencing Past and Future Personal Events: Functional Neuroimaging Evidence on the Neural Bases of Mental Time Travel," *Brain Cognition* 66 (2008): 202–212.; Okuda J, Fujii, T., Ohtake, H., Tsukiuria, T., Tanji, K., Suzuki, K., "Thinking of the Future and Past: The Roles of the Frontal Pole and the Medial Temporal Lobes. *NeuroImage* 19 (2003): 1369–1380.; Addis DR, Pan L, Vu MA, Laiser N, Schacter DL, "Constructive Episodic Simulation of the Future and the Past: Distinct Subsystems of a Core Brain Network Mediate
Imagining and Remembering." *Neuropsychologia* 47 (2009): 2222–2238.

[358] Botzung et al., "Experiencing Past and Future Personal Events: Functional Neuroimaging Evidence on the Neural Bases of Mental Time Travel." In their experiment, test participants were subjected to extensive individual interviews one day before being scanned. The interviewers sought to elicit twenty, freely recalled examples of "events that occurred during the last week" and "projects that were planned for the week following the scanning experiment." Each example was to become "a detailed mental representation of an event" summarized by the test subject "using two cue-words, as a code for subsequent evocation (e.g. museum-exposition)." When eliciting the events, the interviewers instructed the test participants to be very precise. Precision was quantified in each case using a five-point scale whereby an event scored a 5 if it was judged to be richly detailed and highly specific. The interview continued until "20 past events and 20 future projects, all scored 5, had been obtained." Then experimenters initiated four scanning sequences. In each sequence, subjects were given seven cue-word pairs e.g., museum-exposition. Five of the pairs were the subject's own cue-word pairs and two pairs belonged to another test participant. "For the past and the future conditions, the subjects were explicitly instructed to mentally re-experience their recollections and pre-experience their projects when seeing their cue-works ('press the yes key'). They were instructed to respond 'no' if the cue-words did not correspond to their own memories or projects." (There was also a control condition employing a "semantic decision task". In this task, a subject was provided two words e.g., "tennis-racket" or "monk-discotheque" and asked to answer if the words were related or not.)

travel back into the past and toward the future."[359] Botzung and her colleagues found that, despite "the distinct temporal orientation existing between these two MTT [mental time travel] components," they are in fact intimately connected to common neuroanatomical sources.

> Personal past and future event evocations appear to involve similar brain networks. On the bases of both individual and whole-brain analyses, no statistical differences were seen in the pattern of activations sustaining the two tasks we proposed. This result provides new evidence in favour of the idea that past personal experiences provide the necessary foundations to construct possible future events, and that re- and pre- experiencing past and future events may rely on similar cognitive capacities.[360]

Both the re-experiencing of past events and the pre-experiencing of future projects, according to the conclusions of Botzung and her colleagues, necessitate the neurological integrity of the prefrontal cortices and, to be discussed in the following section, the hippocampus. With respect to the prefrontal cortices, these researchers affirm what other teams have said about its roles in self-referential processing and mnemonic reconstruction. They also report that activations in the medial prefrontal cortex are of particular importance to chronesthesia. Botzung and her colleagues conclude by stating that "our results suggest that medial PFC is involved in our capacity to mentally travel in the subjective time, and that both temporal directions more generally exploit dissociative, attributional, and self-referential processes."[361] It seems, then, that chronesthesia is also rightly under-

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[359] Ibid., 202.

[360] Ibid., 204

[361] Ibid.

stood as a neurocognitive capacity enabled, at least in part, by activity within the prefrontal cortex.

*Medial Temporal Lobe*

The medial temporal lobe (MTL) is another member of the core AM network. It is located in the interior aspect of the temporal lobe which is located just above the ears. The medial temporal lobe includes “the hippocampus, parahippocampus, perirhinal and entorhinal cortices”.[362] The latter three structures are often collectively referred to as the “parahippocampal region”.[363] The hippocampus, and these adjacent structures, emerged as a site of vital importance to students of memory with the case of Henry Molaison, (H.M.).[364] In 1953, Dr. William Beecher Scoville performed a “bilateral medial temporal-lobe resection” on Molaison.[365] The surgical procedure excised nearly all of Molaison's hippocampus[366] in an attempt to alleviate the debilitating seizures he had been suffering from

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[362] Svoboda et al.,“The Functional Neuroanatomy of Autobiographical Memory,” 2196.

[363] Timothy A. Allen and Norbert J. Fortin, “The Evolution of Episodic Memory,” *Proceedings of the National Academy of Sciences USA*, 6. 110 (2013): 10379-10386.

[364] Corkin, “Because of Henry’s case, we now know that damage to the hippocampus on both sides of the brain causes amnesia, but in 1953, scientists did not understand that the capacity for memory formation was localized to this particular area. This lack of evidence led to Henry’s tragedy, and studies of his condition filled this gap in knowledge. “ *Permanent Present Tense* , 31. For an extensive yet manageable discussion of hippocampal function see Howard Eichenbaum and Neal J. Cohen’s *From Conditioning to Conscious Recollection: Memory Systems of the Brain* (New York: Oxford University Press, 2001),137-182.

[365] W.B. Scoville and B. Milner, “Loss of recent memory after bilateral hippocampal lesions.” *Journal of Neurology, Neurosurgery and Psychiatry*, 20. 11 (1957), 17.

[366] Corkin, “In the course of the operation, Scoville removed the inner part of the temporal pole; most of the amygdaloid complex; the hippocampal complex, except for about two centimeters at the back’ and the parahippocampal gyrus - entorhinal, perirhinal, and parahippocampal cortices - except for the back two centimeters.” *Permanent Present Tense* p. 31.

since childhood. As Suzanne Corkin reports, the operation did accomplish what Scoville had hoped, albeit with serious unintended consequences.

> Henry's seizures were dramatically curtailed, but this benefit came at a devastating cost. [Henry's parents], who always had to take care of Henry because of his seizures, now found themselves with a son who could not remember what day it was, what he had eaten for breakfast, or what they had said just minutes before. For the rest of his life, Henry would be trapped in a permanent present time.[367]

The lasting lessons of Molaison's case are at least twofold. First, psychological studies of his amnesic condition demonstrated that there are a number of different memory systems.[368] Second, Henry's case illustrated the centrality of the hippocampus for establishing and maintaining long term memories.

Currently, memory scientists readily agree that the hippocampus is fundamentally important for acts of episodic remembering,[369] however, its precise

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[367] Corkin, *Permanent Present Tense*, 33.

[368] Corkin, "He forgot all of his experiences after his 1953 operation, but retained much of what he had learned before that. He knew his parents and other relatives, recalled historical facts he had learned in school, had a good vocabulary, and could perform routine daily tasks, such as brushing his teeth, shaving, and eating. Studying Henry's remaining capacities proved just as instructive as studying those he had lost. One important lesson scientists have learned from people with selective memory loss such as Henry's is that memory is not a single process but a collection of many different processes. Our brains are like hotels with eclectic arrays of guests - homes to different kinds of memory, each of which occupies its own suite of rooms." *Permanent Present Tense*, 51.

[369] Edmund T. Rolls, "Memory Systems: Multiple Systems in the Brain and Their Interactions," in *Science of Memory: Concepts,* 345.

role is still being vigorously debated.[370] In a comprehensive analysis of the hippocampus, Eichenbaum and Cohen, for example, found it necessary to sift through numerous theories of memory centered on the hippocampal system. They were looking specifically for how well theories fit with the amnesic literature and the functional imaging data.[371] More often than not, according to these researchers, these branches of science grew in separate directions.[372]

Both AM reviews register this tension. Svoboda and her colleagues, for example, were unable to explain "why activation in the hippocampus is not more consistently observed in the AM imaging studies as well as in laboratory based studies of memory retrieval."[373] Similarly, Maguire found it "surprising that some

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[370] As Svoboda et al., "It is well established in the patient literature that the hippocampus plays an important tole in episodic memory, particularly during the encoding phase. What remains controversial is the role of the hippocampus in episodic memory retrieval, particularly long-term retrieval." "The Functional Neuroanatomy of Autobiographical Memory," 2196. Howard Eichenbaum and Neil J. Cohen would agree, adding that "[t]here is no universal agreement on what constitutes the 'hippocampal memory system,' requiring that we justify the specific brain structures that will be included here as components of that system. The term hippocampal region was first used to describe the set of medial temporal lobe structures removed in the patient H.M., including most of his hippocampus proper (Ammon's horn), the debate gyrus, the subicular complex, the amygdala, and parts of several cortical areas, including the entorhinal, perirhinal, and piriform cortices. Comparisons of H.M's memory performance with that of patients who have had more restricted medial temporal lobe removals suggested that the degree of damage to the hippocampus per se determined the severity of amnesia." *From Conditioning to Conscious Recollection,* 306.

[371] Eichenbaum and Cohen, *From Conditioning to Conscious Recollection,* 171

[372] Take the notion of novelty as an example. "Based on the finding in a PET study of (right) limbic system activation for novel items compared to perviously studied items, Tulving et al. proposed that there are novelty-encoding networks in the brain responsible for detecting novel stimuli and encoding that information in memory, and that the limbic system, including especially the hippocampal system, is a critical part of that network." After summarizing the study, detailing several imaging studies with different, even opposite, results, and finding no meaningful way to connect the novelty thesis with neuropsychological work with amnesia patients, they write: "Accordingly, the novelty idea has little explanatory power outside the functional imaging data, thereby providing an independent reason to argue against it as a full account of hippocampal function." *From Conditioning to Conscious Recollection,*171-173.

[373] Svoboda et al., "The Functional Neuroanatomy of Autobiographical Memory," 2196.

of the studies do not report hippocampal activations."[374] While Svoboda and her team nevertheless conclude that "the hippocampal complex is thought necessary for recovery of an episodic memory for as long as it exists," the functional images needed to support this claim "appear equivocal."[375]

Despite these legitimate discrepancies, the hippocampal region should still be considered a fundamentally important scientific area of interest for those working to understand episodic memory. Particularly because the amnesia literature is so consistent on the subject. In fact, both reviews affirm a growing consensus among memory scientists: the hippocampus and related MTL structures "contribute to episodic remembering by binding the pattern of activity present at the time of encoding into a memory trace that is sustained across time and rein-

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[374] Maguire, "Neuroimaging Studies of Autobiographical Event Memory," 1445.

[375] Svoboda et al.,"The Functional Neuroanatomy of Autobiographical Memory," 2199. The most credible explanations for these surprising results are predicated either on suspicions about methodological incongruities in a given experiment or on the presumed influence of additional phenomenological factors on episodic memories. Svoboda and her colleagues, highlighting the latter explanation, found that across the neuroimaging studies several variables were left unaccounted for. For instance, factors known to impact MTL activation patterns such as "vividness, amount of detail and emtionality of the event recalled" may have "contributed to the inconsistent pattern of MTL activation observed during AM retrieval." Ibid., 2197. Both reviews also discussed potential problems with experimental designs and, again, reiterated the difficulty of effectively studying a multimodal cognitive phenomenon like episodic memory. For instance, Maguire explains that three methodological incongruities in particular likely contribute to the disparate findings regarding hippocampal activations. These potential experimental artifacts include 1) vastly different interactions with subjects prior to the scanning sessions, 2) significant differences in the scanning sessions themselves (such as how the AMs are cued, how much time subjects have to think about AMs, and the degree of retrieval effort required during each scan), and 3) noteworthy differences with respect to the contrast conditions used as comparative scans to autobiographical memory scans. "Neuroimaging Studies of Autobiographical Event Memory," 1445. Taken together, the methodological incongruities and phenomenological variables present formidable challenges for future research projects endeavoring to clarify the precise role/s of the hippocampus in particular and the medial temporal lobe in general during episodic memory encoding and retrieval.

stated during retrieval."[376] This popular view suggests that the hippocampus is the key neuroanatomical structure within the AM network. It functions to preserve the neural pattern, or encode what was initially laid down in the brain during an original experience, for its later reemergence, or retrieval, during an act of recollection. This proposal is highly significant, if not yet entirely supported by the neuroimaging evidence. If confirmed, it firmly positions the hippocampus "as the critical hub" in the processes of episodic memory encoding and retrieval.[377]

*Case Studies Revisited*

The core neurological network enabling autobiographical memory is greatly supported by neuroimaging evidence. But does this evidence square with the clinical assessments of K.C., M.L., and D.B. discussed above?[378] Any response to this question, must immediately note that drawing inferences by comparing neuropsychological analyses and functional imagery is not a straightforward process. There is, however, considerable overlap in the two sources of data lending critical support to Tulving's original insights and to the more recent investiga-

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[376] Svoboda et al., "The Functional Neuroanatomy of Autobiographical Memory," 2197. In the next chapter we will discuss Davachi and Danker's 'memory as reinstatement' (MAR) model. The MAR does in fact posit a central role to the hippocampus.

[377] Davachi and Danker, "Cognitive Neuroscience of Episodic Memory," 381.

[378] Evaluations of Henry Molaison's amnesic condition reveal a neuropsychological profile of impairments and competencies closely paralleling those of K.C., M.L. and D.B. For instance, Scoville and Milner demonstrated that Henry had a "Wechesler I.Q. rating of 122" and was "still of superior intellect," however, "once a new task was introduced there was total amnesia for the preceding one; in his own words, the change of topic confused him." Scoville and Milner p. 17. While he was not able to remember, Henry was able to learn. In fact, Henry vastly improved on a "hand-eye coordination skill (tracing an outline of a star in a mirror) over a period of days" without ever remembering that "he had practiced the task before." Squire, "Memory Systems: A Biological Concept," in *Science of Memory: Concepts*, 339.

tions of the neural correlates of autonoesis and chronethesia.[379] We can reasonably relate functional images and clinical observations of amnesic patients using a principle Maguire referred to as "effective connectivity, i.e., the influence one neural system exerts on another."[380] Consistent with both Svoboda and her colleagues' sense that AM is multi-modal in nature and Schacter's notion that episodic memory is a nonunitary entity, Maguire's principle tries to account for how various anatomical structures often functionally integrate to achieve autobiographical memory consolidation and retrieval. As she points out, "memory is not the property of brain regions operating in isolation but rather of brain networks; thus, functional integration within this network must also be considered."[381]

As far as I can discern, D.B. never participated in neuroimaging studies of any kind. He did, however, undergo an impressive battery of psychological tests and interviews. The evaluations of D.B., administered by Klein, Loftus, and

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[379] This support is particularly convincing if we remember that higher order cognitive capacities like episodic memory depend on productive interactions between constituent members of the core AM network as a whole. If one, or more, of the neuroanatomical structures is impaired, then the network's expected outputs likely fail. In this way, there is no empirical argument to be made from these data sets that succeeds or fails based on the establishment of a one-to-one relationship associating the activation of a single neuroanatomical structure and a specific neuropsychological function. Such a reductive burden falls only on localizationist theories of higher cognition. The causal relationships within a network of interacting brain structures is inherently more complicated. In contrast to phrenological fantasies, then, current research programs assume that the achievement of any higher order cognitive function will be predicated upon more extensive neural activation patterns.

[380] Maguire, "Neuroimaging Studies of Autobiographical Event Memory," 1448.

[381] Ibid.

Kilhlstrom, are consistent with the findings of Botzung and her team.[382] K.C. and M.L. did participate in several neuroimaging experiments. According to Rosenbaum and his colleagues, the scans of K.C.'s brain reveal that his VLPFC and "underlying white matter are spared in their complete extent,"[383] while his mPFC showed some adverse affects attributable to the surgical procedure preformed immediately after his accident.[384] M.L.'s scans are different. While M.L's medial temporal lobe structures appear normal,[385] a "cluster of hypointensities" are evident "in the right ventral frontal cortex and white matter".[386] Two other indications of brain tissue damage also appeared in the VLPFC.[387]

With regard to K.C. and M.L., then, component parts of the core AM network are impaired - in the former it is the mPFC that was damaged while in the latter it was the VLPFC. The overall result for both men is the same: the prefrontal cortex is unable to effectively connect with itself, or with other areas of the core AM network. Disrupted communications within the core network is, in part,

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[382] For example, D.B.'s inability to re-experience (remember) his past directly parallels his inability to pre-experience (imagine) his future. This suggests the existence of a common neurological source for chronesthesia.

[383] Rosenbaum et al., "The Case of K.C.," 999.

[384] Ibid.

[385] Levine et al., "Episodic Memory and the Self in a Case of Isolated Retrograde Amnesia," 1960.

[386] A hypointensity, according to Levine and his colleagues, indicates actual loss of brain tissue.

[387] The first "at the ventrolateral cortical surface of the inferior frontal gyrus (Brodmann area 47) and extended into the white matter" and another one in "white matter deep to frontal cortex" which suggests "interruption of the ventral frontal aspect of the right uncinate fasciculus." 1961.

why neither K.C. nor M.L. seem to possess autonoetic consciousness or the ability to travel mentally through time.[388] In K.C.'s case, there was even greater evidence of damage in that other key component of the core AM network, the medial temporal lobe.

Like Molaison, K.C.'s brain also revealed "almost complete hippocampal loss bilaterally".[389] Neuroimaging showed that "the hippocampal formation is in large parts necrotic in both hemispheres, and any remnants of non-necrotic tissue appear severely atrophic." In addition, "tissue loss" in the surrounding medial temporal cortices appears to be "less severe but substantial nonetheless." Functional imaging also suggests "necrosis in entorhinal cortex, and there is evidence of pronounced atrophy in perirhinal and parahippocampal cortices."[390] The scans of M.L.'s hippocampal region, on the other hand, reveal "no lesions in the medial temporal lobe" and "volumetric analyses" of the left and right hippocampi indicate that these "structures are normal."[391] Given their distinct medial temporal lobe scans, how is it that these amnesia patients express such a similar set of cognitive impairments and competencies? Again, like our discussion of the prefrontal cortices, damage to other structures within the core AM networks of K.C. and M.L. likely contribute to their similar pathologies. However, unlike our discussion

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[388] Levine et al., "Episodic Memory and the Self in a Case of Isolated Retrograde Amnesia," 1967-1968.

[389] Rosenbaum et al., "The Case of K.C.," 993.

[390] Ibid., 999.

[391] Levine et al., "Episodic Memory and the Self in a Case of Isolated Retrograde Amnesia," 1961.

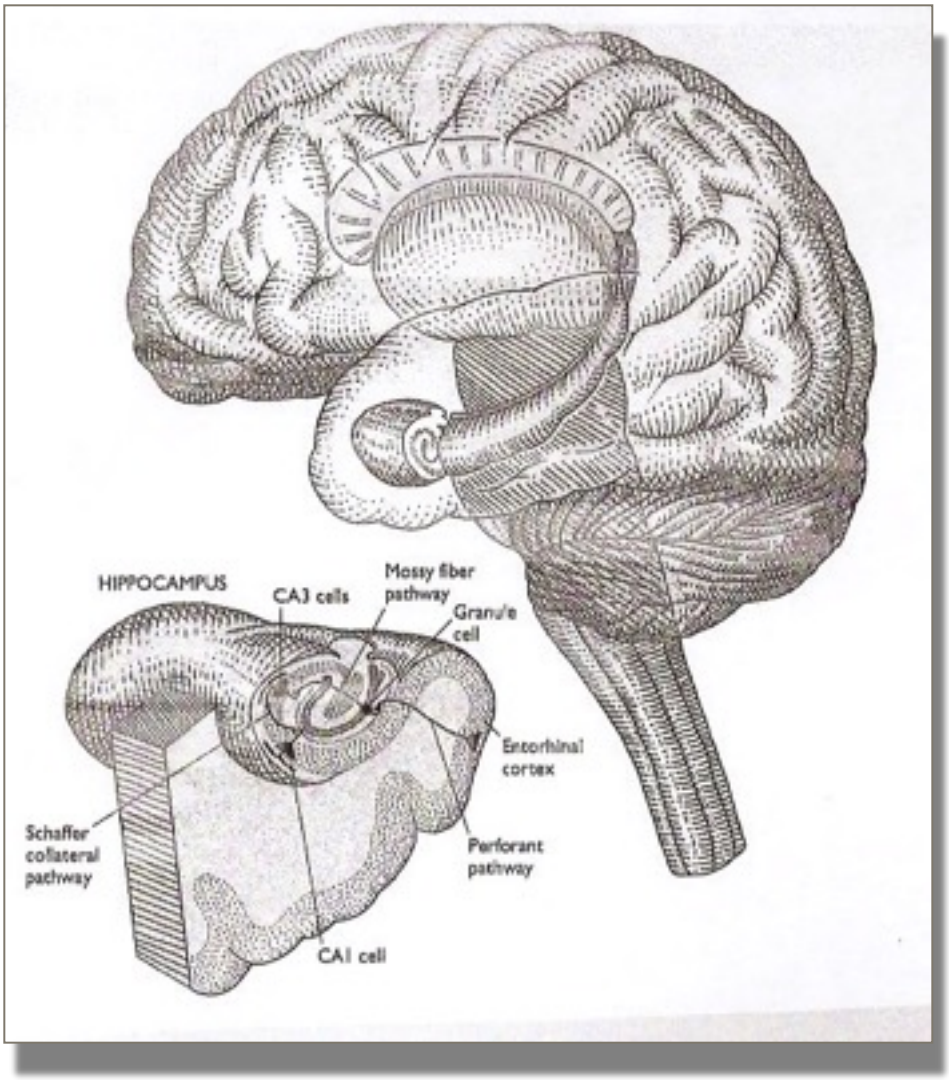
of the prefrontal cortices, the disconnect between neuroimaging evidence and neuropsychological work focusing on the hippocampus has something to do with the fact that the precise role of the hippocampus is still not entirely understood.

The establishment, maintenance, and retrieval of any autobiographical memory is bound to be a complex story. It inherently involves the entire cast of core network characters. Any neuroanatomical account of these mnemonic processes must therefore recognize that Tulving's triad is enabled by the interactive neural network we have been describing. Thus far, the advanced imaging techniques have shown that the healthy, mnemonic brain must functionally integrate. It takes a neurological village to enable what we subjectively experience as having personal memories of our very own. When we combine this neuroanatomical evidence with the clinical insights of amnesic cases, we go a long way toward establishing the kind of physiological narrative of memory Warnock sought. In the next section, we complete the narrative by turning our attention to the molecular mechanisms and cellular processes thought necessary for any effort to remember and learn from experience.

### *II. LTP in the Hippocampus*

Thus far, we have discussed the core AM network, as this network encompasses the relevant anatomy supporting Tulving's triad. Within this network,

we have been primarily interested in specific areas of the prefrontal cortex and medial temporal lobe. Residing deep within the latter is the hippocampus. The internal processes and functional pathways of the hippocampus is the concern of this penultimate section.[392] About the size of child's thumb, the hippocampus is comprised of the dentate gyrus (DG), the CA fields (CA1 and CA3),




[392] The complexities of this ongoing research are considerable. In what follows, I will be offering a much simpler account than is currently available. My brief sketch here is justifiable, I submit, because it adequately serves a twofold purpose. First, to illustrate that memory research has in fact reached striking depths and, second, to introduce the evidentiary support used by other philosophers to suggest how memory science offers a window into nature's complex pluralistic unity. This latter suggestion will seek to follow, connect, and reapply the work of of Carl Craver and Lawrence Cahoone in the final chapter of this project.

and the subiculum (S).[393] As Nakazawa and his colleagues report, each of these hippocampal regions has been theoretically linked, and empirically shown to varying degrees, to play distinct roles in mnemonic phenomena.[394] These component parts of the hippocampus are connected by three principal pathways - the perforant pathway which leads into the DG from an area of the brain adjacent to the hippocampus, the entorhinal cortex; the mossy fiber pathway which links cells in the DG to cells in the CA3; and the Schaffer collateral pathway which runs from CA3 cells to the CA1 region.[395] With respect to a long-term declarative memory system like episodic memory, the synaptic connections of these internal pathways are believed to be strengthen by a type of cellular facilitation called long-term potentiation (LTP). According to current memory science, LTP is considered an important foundation for neural plasticity.[396] This molecular and cellu-

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[393] Larry R. Squire, Robert E. Clark, and Peter J. Bayley, "Medial Temporal Lobe Function and Memory," in *The Cognitive Neurosciences* 3rd Edition ed. Michael S. Gazzaniga. (Cambridge, MA: MIT Press, 2004), 691-708. Squire and Kandel, *Memory: From Mind to Molecules*, 110-116. Eichenbaum, and Cohen, *From Conditioning to Conscious Recollection: Memory Systems of the Brain*, 62-97. K. Nakazawa, T.J. McHugh, M.A. Wilson, and S. Tonegawa, "NMDA Receptors, Place Cells and Hippocampal Spatial Memory." *Nature Reviews Neuroscience*. 5 (2004): 361–372.

[394] Nakazawa et al., "NMDA Receptors, Place Cells and Hippocampal Spatial Memory," 361–372.

[395] The figure is from Squire and Kandel, *Memory: From Mind to Molecules,* 111. For an accessible account of these neurobiological intricacies see Rusiko Bourtchouladze's *Memories are Made of This: How Memory Works in Humans and Animals*. (New York: Columbia University Press, 2002), 112-144.

[396] This is a contested position. John T. Bruer, for instance, writes that "LTP as a high level causal mechanism for learning and memory may represent more of a dogma of neuroscientific memory research than a hypothesis that is being rigorously tested." "Plasticity: on the level" in *Science of Memory: Concepts,* 91.

lar mechanism is significant not only for how it has been shown to support learning and memory but also for what it means for neuroscientific inquiry in general.

The discovery of LTP is an interestingly complex story.[397] Only the basics of this fairly well-documented means of synaptic plasticity will be given here. Methodologically speaking, current neurobiological investigations of LTP have greatly benefited from the "transgenic revolution" using mice,[398] from Eric Kandel's Nobel Prize winning work with a species of giant sea snail, *Aplysia*,[399] and from *in vivo* studies of hippocampal 'slices' grown in Petri dishes.[400] Of particular interest to understanding forms of long-term memory like episodic memory are the processes that occur within the CA1 region. Researchers using hippocampal slices have consistently demonstrated that the inducement of LTP in the Schaffer collaterals of the CA1 requires two fundamental synaptic events - the activation of presynaptic inputs and the depolarization of the postsynaptic cell.[401] Both of

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[397] Craver, *Explaining the Brain,* 235-246. For fuller detail, see Craver, "The Making of a Memory Mechanism," *Journal of the History of Biology,* 36 (2003): 153-195.

[398] Alcino J. Silva, "Molecular Genetic Approaches to Memory Consolidation," in *The Memory Process,* 41-54.

[399] Eric R. Kandel, *In Search of Memory: The Emergence of a New Science of Mind.* (New York, NY: W.W. Norton & Co, 2006), 180-285.

[400] Eichenbaum and Cohen, *From Conditioning to Conscious Recollection,* 65. While these authors tout the experimental virtues of these 'slices' because they allows for "multiple input and output pathways to be preserved intact and to be manipulated independently," Eichenbaum and Cohen are quick to point out that such laboratory preparations lack "the complex influences of the normal inputs and outputs of the hippocampus". However, they acknowledge, hippocampal slices provide "an especially clear access to cells and intrinsic connections of the hippocampal circuit." Ibid.

[401] Squire and Kandel, *Memory: From Mind to Molecules,* 113-116; Bourtchouladze, *Memories are Made of This,* 135-138; Eichenbaum and Cohen, *From Conditioning to Conscious Recollection*, 66-70; Craver, *Explaining the Brain*, 165-170.

these actions can be experimentally produced using a single stimulus of sufficient strength, such as a repetitive electrical pulse.[402] In an experimental setting, the electrical stimulus represents an experience or event from an organism's environment that would be processed and perhaps remembered or learned from. When the high-frequency stimulus is administered to the presynaptic cell, it releases an excitatory transmitter, glutamate. Glutamate effects the postsynaptic cell "on at least two major species of glutamate receptor in the receiving cell," an NMDA (N-methyl-D-aspartate) receptor and a non-NMDA, or AMPA (a-amino-3-hydroxy-5methyl-4-isoxazolepropionate) receptor.[403] Under normal circumstances, that is, during low-frequency stimuli or during ordinary synaptic transmission, the channel of the NMDA receptor is blocked by magnesium ions (Mg++) and the AMPA receptor is open to allow sodium (Na+) and potassium ions (K+) into the postsynaptic cell.[404] When a sufficiently strong and persistent stimulus occurs, and glutamate is released, the non-NMDA receptor is unaffected but the NDMA receptor responds by displacing its Mg++ block. When the Mg++ block is vacated, a channel is created in the postsynaptic cell. This channel allows calcium ions (Ca++) (and more Na+ and K+) to flow into the cell. The influx of calcium ions effectively depolarizes the postsynaptic cell. This, then, is the twofold first step underlying the induction of LTP: presynaptic release of glutamate and post-

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[402] Squire and Kandel, *Memory: From Mind to Molecules,* 112. While presynaptic activation and postsynaptic depolarization occur in response to the same stimuli, the events can be manipulated to provide important insights about each individual event separately.

[403] Squire and Kandel, *Memory: From Mind to Molecules*, 113.

[404] Ibid., 114.

synaptic depolarization due to calcium inflow. These coupled, molecular events are central to the cellular processes which lead to the enhancement of synaptic transmission between neurons.

After this initial twofold step, researchers have demonstrated how the calcium ions in the postsynaptic cell function to help establish and maintain LTP. There is considerable debate and still much to learn.[405] Nevertheless, the "leading view," according to Eichenbaum and Cohen, is that "the role of C++ is to activate kinases, enzymes that phosphorylate proteins, transforming them into their active configuration."[406] The activated kinases in the postsynaptic cells of the CA1 region of the hippocampus are CaMKII, PKC, and a tyrosine kinase, fyn.[407] Their respective activities have been carefully observed to clarify how they each support LTP and its lasting result: synaptic connection and neural growth.[408] As Squire and Kandel explain in detail, by influencing gene transcription and inciting

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[405] For instance, Squire and Kandel propose that calcium ions play at least two major roles in the postsynaptic cell. An aspect of the first, an interaction with various kinases will be detailed in this section. The second role is "quite a radical idea." That is, "LTP in the Schaffer collateral pathway may require an additional mechanism, one that reflects a new principle of nerve cell communication." The neurobiologists propose that the postsynaptic cell releases "a signal that diffuses back to the presynaptic terminals, where it acts to enhance the probability that an action potential will trigger transmitter release." They refer to this as a "retrograde signal" and speculate that it may be nitric oxide (NO). 117. The advantage of this retrograde signal is not only to explain how LTP is maintained by an interactive back-and-forth between pre- and postsynaptic cells but also to indicate how individual cells might recruit neighboring cells into being activated. *Memory: From Mind to Molecules,* 118. See also Craver, *Explaining the Brain*, 250.

[406] Eichenbaum and Cohen, *From Conditioning to Conscious Recollection*, 68.

[407] Squire and Kandel, *Memory: From Mind to Molecules*, 116.

[408] Each kinase has its own functional trajectory. For instance, Eichenbaum and Cohen briefly chart how CaMKII has been shown to convert "inactive AMPA receptors to active ones, 'waking up' previously 'silent' synapses." Similarly, PKC and fyn have been experimentally injected or withheld to study how either condition effects LTP and synaptic connections. *From Conditioning to Conscious Recollection*, 68-70.

protein synthesis, these kinases create the conditions for the growth of new cells and additional cellular connections.[409] Much of our current understanding of the details beneath these mnemonically relevant processes come from studies of mice and, an even simpler creature, the giant sea snail, *Aplysia*.[410]

According to Alcino J. Silva, the use of transgenic or knockout mice[411] created a "revolution that swept through biology in the late 1980s and early 1990s."[412] Neurobiologists of memory effectively utilized these mutant mice to

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[409] Squire and Kandel, *Memory: From Mind to Molecules*, 138-155.

[410] Research with mice and snails are certainly reductive approaches to learning and memory. Kandel is unapologetic, undeterred. For instance he claims, rather grandiosely perhaps, that "when the intellectual historians look back on the last two decades of the twentieth century, they are likely to comment on the surprising fact that the most valuable insights into the human mind to emerge during this period did not come from the disciplines traditionally concerned with mind - from philosophy, psychology, or psychoanalysis. Instead, they came from a merger of these disciplines with the biology of the brain, a new synthesis energized recently by the dramatic achievements in molecular biology. The result has been a new science of mind, a science that uses the power of molecular biology to examine the great remaining mysteries of life." *In Search of Memory*, xii. Silva would concur. He is, however, a little more matter of fact about reductive research. "The distinguishing feature of molecular and cellular cognition is a dogged determination to account for psychological phenomena with fully integration molecular, cellular, and system explanations." "Molecular Genetic Approaches to Memory Consolidation," 43. Reductive approaches are impressive and have shed important light on mnemonic phenomena. The philosophical task is to respect this kind of research while still being able to avoid 'nothing but' arguments. Craver's conceptualization of the unity of neuroscience as a mosaic allows for both. He invites various stake holders from every level of analysis to enhance and constrain the working knowledge of memory without having to reduce or 'bottom out' any of their insights to a lowest known foundation of memory.

[411] A "transgenic" mouse is a creature genetically engineered in such a way that it expresses a modified gene. In memory science, this entailed modifying alpha-calcium-calmodulin kinase II (αCaMKII) "which encodes a synaptic kinase thought to modulate neuronal communication in brain regions, like the hippocampus, involved in memory." Silva, "Molecular Genetic Approaches to Memory Consolidation," 44. A "knockout" mouse is a creature engineered in such a way that a specific gene is deleted or otherwise blocked from expressing itself. In memory science, mutant knockout mice have been invaluable for studies of spacial memory. See R.G.M. Morris et. al., "Selective Impairment of Learning and Blockade of Long-Term Potentiation by an N-Methyl-D-Aspartate Receptor Antagonist, AP5," *Nature* 319 (1986): 774-776.

[412] Sliva, "Molecular Genetic Approaches to Memory Consolidation," 43.

demonstrate, among other things, a “causal link between synaptic mechanisms, hippocampal (Ca1) long-term potentiation, and spacial learning and memory.”[413] Several research teams were either able to pharmacologically manipulate or genetically modify mice to better understand how LTP is established and maintained at the cellular level. Of particular relevance to memory science, work with mutant mice identified the gene transcription factor (αCaMKII) as a key player in the establishment of LTP. These initial mice studies were focused primarily on the early phases of LTP or short term memory.[414] However, they paved the way for researchers to identify other relevant transcription factors thought necessary for later phases of LTP and long-term memory. In fact, Eric Kandel and his colleagues replicated, then expanded, this research by identifying the transcription factor cAMP-responsive element-binding protein (CREB) and explaining its role in the stabilization of later phases of LTP. Thus, they were able to shed light on the neurobiological foundations of long-term memory.

While not concerned with Warnock’s octopuses or flatworms, Kandel meticulously scrutinized the nervous system of a giant sea snail, *Aplysia,* a

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[413] Ibid., 45.

[414] Ibid.

species native to the California coast.[415] Kandel and his team first analyzed the cellular mechanisms of short-term memory in *Aplysia* by using a repeated electrical pulse to the creature's tail.[416] Because of *Aplysia's* simple nervous system, what transpired in the wake of the tail shock could be fully mapped and even manipulated to uncover its minutest details. Delving into the snail's "modulatory circuit,"[417] these researchers sought to understand what low-level processes and changes were needed to achieve short-term memory and eventually something like a long-term memory.[418] What Kandel and his team found is that an electrical stimulus activates the release of a transmitter, serotonin, from sensory cells in the *Alypsia's* tail. When serotonin crosses the synaptic cleft to bind to the recep-

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[415] Kandel, *In Search of Memory*, 144. Kandel was convinced that *Aplysia* was a perfect creature to study. This sea snail has a rather simple nervous system - a small number of neurons, about 20,000, grouped into nine separate clusters, or ganglia, as compared to the hundred billion cells in the mammalian brain. Furthermore, some *Aplysia* neurons are visible with the naked eye. What Kandel and his colleagues were able to accomplish by studying this giant sea snail is remarkable. His team was able to map the entire cellular substructure of *Aplysia*, chart and manipulate of a number of *Aplysia's* behaviors, e.g., heart rate, respiration, egg laying, inking, release of mucus, and withdrawal of the gill and siphon, and eventually grow individual nerve cells and induce synaptic connections in the lab. Ibid., 146-147; 253-255.

[416] In this brief account, the methodological similarities between Kandel's work and what was recounted from earlier studies will be evident.

[417] Kandel and his colleagues found two kinds of neural circuits in Aplysia. One is a direct, or "mediating" circuit and the other is a "modulatory" circuit. The former "produce behavior directly," like a reflex. That is, a mediating circuit in Alpysia includes sensory neurons that innervate motor neurons which control, for instance, the creature's siphon, a fleshy spout that expels seawater and waste, interneurons, and motor neurons that control the reflex of gill-withdrawal. Shocking the siphon "produces a brisk defensive withdrawal of both siphon and the gill," a reflex which Kandel and his colleagues, were able to modify "by two forms of learning," habituation and sensitization, giving rise to a "short-term memory that lasts for a few minutes." Kandel, *In Search of Memory*, 189.

[418] Modulatory circuits are behaviorally efficacious as learning serves to fine tune the circuit over time thereby strengthening the "synaptic connections between sensory and motor neurons." Ibid., 223.

tor sites of postsynaptic cells, it leads to the production of cyclic AMP and protein kinase A.[419] For long-term memory to occur, there must be an increased amount of serotonin so as to also increase the amount of cyclic AMP and protein kinase A within a postsynaptic cell. As Kandel explains, this increase is key.

> We found that whereas a single pulse of serotonin increases cyclic AMP and protein kinase A primarily at the synapse, repeated pulses of serotonin produce even higher concentrations of cyclic AMP, causing protein kinase A to move into the nucleus, where it activates genes…. Thus we confirmed our idea that one of the functions of repeated sensitization training - why practice makes perfect - is to cause the appropriate signals in the form of kinases to move into the nucleus.[420]

Following the cascade of events, it is important that cyclic AMP and protein kinase A venture into the cell nucleus of *Aplysia* because that is where the regulator protein called "cyclic AMP response-binding element," or CREB resides. Kandel and his colleagues discovered that CREB is not only highly responsive to protein kinase A but is also a "key component of the switch that converts short-term facilitation of synaptic connections to long-term facilitation and the growth of new connections."[421] Actually, they found two protein regulators e.g., CREB-1 and CREB-2. What is regulated is the genetic expression necessary for the growth of new synaptic connections. This particular protein regulator does its job in one of two ways: either by acting as an activating agent which "switches on effector genes"[422] or by acting as a repressing agent that switches them off. CREB-1 is an

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[419] Kandel, *In Search of Memory,* 262.

[420] Ibid, 263.

[421] Ibid.

[422] Ibid., 262.

activator and CREB-2 is a repressor. After repeated tail shocks, then, protein kinase A, and another kinase called MAP kinase, "move into the nucleus, where protein kinase A activates CREB-1 and MAP kinase inactivates CREB-2."[423] In the *Aplysia*, this activation/inactivation dynamic is necessary for learning. The cellular building blocks for long-term memory emerge because the "facilitation of synaptic connections requires not only a switching on of some genes, but also the switching off of others."[424] In the end, long-term memory is achieved in *Aplysia* because of the integration of these "opposing actions". The two CREB regulators serve to change "the function and the structure of the cell."[425]

As this brief account demonstrates, neurobiological research provides prominent examples of the benefit of animal research for memory science.[426] By studying beautifully simple creatures, memory scientists shed important light on key biological changes and patterns necessary for learning and memory in all creatures. Indeed, it is fascinating to read how researchers like Kandel extrapolate big insights from these minuscule dynamics. "CREB's opposing regulatory actions provide a threshold for memory storage, presumably to ensure that only important, life-serving experiences are learned. Repeated shocks to the tail are a

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[423] Ibid., 264.

[424] Ibid.

[425] Ibid.

[426] It is important to note that even among the most accomplished memory scientists whose research is fundamentally bound to animal research, there is a recognition that this research presents numerous ethical challenges with regard to the human treatment of animal test subjects. See, for example, Steven Rose's *The Making of Memory: From Molecules to Mind*. (London: Random House, 2003)

significant learning experience for an *Aplysia*, just as, say, practicing the piano or conjugating French verbs are to us: practice makes perfect, repetition is necessary for long-term memory."[427] But Kandel and Silva are willing to go a step further. It is not just that they argue that these reductive neurobiological accounts of memory - whether in mice, snails, rats, or flies - parallel the mnemonic dynamics in human animals. Rather, they vigorously posit that these neurobiological processes and mechanisms are common to nearly all evolved creatures.[428] In this way, memory is not unique to the human animal because the molecular and cellular events have "proved to be the same in several species of animals, indicating that it has been conserved through evolution.[429] After all, we humans, while unique in certain respects, are nevertheless fully natural beings.

Our twofold neurological descent in this chapter has offered increasingly smaller glimpses of constituent aspects of the mnemonic brain. Understanding the natural depths of memory has meant rehearsing some rather technical material. It is possible, even preferable to many thinkers, and definitely much easier, to ignore the research contained here. Intellectual avoidance has its costs, though. If philosophers and theologians of memory do not attempt to incorporate, if not

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[427] Kandel, *In Search of Memory*, 264

[428] Kandel, connecting his work with a species of snail with similar work with a species of fruit fly, writes: "The mutually reinforcing results in *Aplysia* and *Drosophila* - two very different experimental animals examined for different types of learning using different approaches - were vastly reassuring. Together, they made it clear that the cellular mechanisms underlying simple forms of implicit memory are likely to be the same in many animal species, including people, and in many different forms of learning because those mechanisms have been conserved through evolution." Ibid., 234.

[429] Ibid., 266.

re-contextualize, even a fraction of these kinds of physical analyses, we are destined at best to merely rehearse the insights of past generations. While there are myriad reasons to engage with the biological complexities of memory,[430] the purpose of this chapter, and the previous one, has been to fashion a scientifically driven narrative account of episodic memory. It is my hope that delineating the natural width and depth of memory will generate an appreciation of the remembering mind itself as a throughly embodied power and unique axiological product of nature with a tractable evolutionary provenance and religious significance. Thus, in the final chapter, I expect the ways and means of episodic memory to find a proliferative home within my own developing brand of religious naturalism.

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[430] John Bickle claims that memory research is among "neuroscience's best cases". Therefore, we are advised to look into this research if "we want to know what state-of-the-art neuroscience can teach us about the status of our commonsense conception of the mental, about methodology in the cognitive and brain sciences, about the scope and limits of scientific reductionism, about the nature of causal-mechanistic explanations and their place in science more generally, about multiple realization and its lessons, and about the conditions on sufficient evidence for establishing a cellular or molecular mechanism for a cognitive function". "Memory and Neurophilosophy," 211-212.

## Chapter 4
## *Remembering Religion On Mnemonic Grounds*

In this final chapter, we have several important lines of inquiry to newly draw together, or perhaps more clearly keep apart. Recall two opposing figures from the preceding chapters: the mnemonist and the amnesic. The latter struggles to remember; the former cannot forget. Both conditions, as Nietzsche rightly acknowledged, are troubling. Neither individual will easily flourish unless some kind of balance is reclaimed. At this point in the project, it must be asked: can the lessons and impact of such extreme, even tragic individual cases be appropriately scaled up to play a meaningful role in an engagement with a collective phenomena like religion? Is there a pressing need to introduce into religious theory and practice an appreciation for how collectives actively remember and need to forget? The answer is a qualified, yes. We have, after all, been cautioned about making overly-hasty theoretical or conceptual moves from individual to collective phenomena. As Yosef Yerushalmi has written, while the amnesic and the mnemonist serve us well

> as initial metaphors, they must not be allowed to linger as analogues. As the 'life of a people,' is a biological metaphor, so the 'memory of a people,' is a psychological metaphor - unless one personifies the group as an organism endowed with a collective psyche whose functions correspond in every way to that of the individual - which is to say, unless one chooses to read history with Freud and face the consequences of a now discredited psycho-Larmarckism.[431]

Yerushalmi properly alerts us to the metaphorical flavor of phrases like collective memory, and his 'unless,' that grammatical segue in a conditional clause indicat-

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[431] Yerushalmi, *Zakhor*, 109.

ing a way to redress an earlier assertion, offers only one outdated and untenable path forward.[432] What he dismisses, however, bears some relation to what I will propose below.[433] Currently, there is a well-formulated evolutionary account of episodic memory, and it can be effectively used to support my attempts to connect the inner, individual workings of episodic memory with their wider implications for collective religiosity. Indeed, a large part of the payoff of going through the methodologically varied, often tedious, and multi-tiered scientific narrative of episodic memory is making such connections. The task of this chapter, then, is to place Tulving's triad on sound evolutionary ground in order to extricate some of the relevances of memory science from the perspective of religious naturalism. Toward this end, the present chapter will be divided into three sections. The first offers an evolutionary account of Tulving's triad with an emphasis on the novelty of future-oriented thought. The second section works to extend and contextualize the implications of this account with recourse to the sociological study of religion

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[432] Before Freud, Richard Semon, the German biologist who coined the term, engram, sought to elucidate an ambitious, pre-Mendelian evolutionary explanation of "hereditary phenomena in terms of memory." Schacter, Daniel L. *Stranger Behind the Engram: Theories of Memory and the Psychology of Science*. (Hillsdale, NJ: Lawrence Erlbaum, 1982),105. Semon writes: "The attempt to discover analogies between the various organic phenomena of reproduction is by no means new. It would have been strange if philosophers and naturalists had not been struck by the similarity existing between the reproduction in offspring of the shape and other characteristics of parent organisms, and that other kind of reproduction which we call memory. Should the present or any subsequent author succeed in proving that this similarity is more than superficial, there will be no lack of critics who will remind us that some ancient or modern thinker has already conceived the idea." Semon, Richard Wolfgang, *The Mneme*. (New York, NY: Macmillian, 1921), 9.

[433] Related in the sense that evolutionary theory itself is an evolving set of ideas and methods with a complex history. One particular line of inquiry around the notion of inheritance is stretched along an continuum whereby Darwin's notion of descent with modification has become an umbrella dynamic applied to both adaptive traits and acquired characteristics. I mention this historical fact not to imply that the current 'neo-Darwinian synthesis' is in question but only to emphasize that the notion of inheritability has been utilized to explain all kinds of handed-down phenomena.

provided by Daniele Hervieu-Léger and a naturalistic, general theory of religion offered by Loyal Rue. The final section of this chapter will build off Rue's work and continue our religious naturalist exploration of memory with help from Carl Craver and Lawrence Cahoone as both thinkers have sought to integrate the various levels and orders of nature to open up new unifying vistas from which to appreciate and even venerate the mnemonic grounds of nature.

**I. Evolution, Episodic Memory, and the Future**

Endel Tulving's more recent writings on the adaptive advantages of episodic memory are couched in a broader assertion that his triad - autonoetic consciousness, chronesthesia, and episodic memory - is unique to the human animal. Taking such a position, he knows, causes significant consternation among scientists who affirm "that there are no essential differences between humans and the various 'others'."[434] Tulving's insistence, far from a "campaign for human superiority," actually resides within what he sees as a fundamental "acknowledgement of both similarities and difference in animal kingdom".[435] One could cite example after example of what makes a species special — after all we are not the *same* species — but these attributes, according to Tulving, would not necessarily

> rule out the general principle of phylogenetic continuity. Equally important, broad phylogenetic continuity does not rule out differences between the species, even those that to an external observer may seem like gaps.

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[434] Tulving, "Episodic Memory and Autonoesis: Uniquely Human?" 3.

[435] Ibid., 4.

Diversity in nature can take many diverse forms.[436]

The particular, natural diversity that is the autonoetic episodic memory system, including its support for our ability to mentally travel through time, has been deemed evolutionarily contiguous at the lowest levels of biological organization.[437] For instance, in the previous chapter we encountered some of the neurobiological research into the cellular and molecular processes subserving long-term memory. Eric Kandel explains that because "human mental processes have long been thought to be unique," early brain researchers

> expected to find many new classes of proteins lurking in our gray matter. Instead, science has found surprisingly few proteins that are truly unique to the human brain and no signaling systems that are unique to it. Almost all of the proteins in the brain have relatives that serve similar purposes in other cells of the body. This is true even of proteins used in processes that are unique to the brain, such as the proteins that serve as receptors for neurotransmitters. All life, including the substrate of our thoughts and memories, is composed of the same building blocks.[438]

Kandel further emphasizes that these signaling systems and proteins are not even exclusive to mammals. In fact, they have been

> conserved — retained at is were —through millions of years of evolution. Some of them were present in the cells of our most ancient ancestors and can be found today in our most distant and primitive evolutionary relatives: single-celled organisms such as bacteria and yeast and simple multicellular organism such as worms, flies, and snails. These creatures use the same molecules to organize their maneuvering through their environment that we use to govern our daily lives and adjust to our environment.[439]

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[436] Ibid.

[437] Bickle, "Memory and Neurophilosophy," 200.

[438] Kandel, *In Search of Memory*, 236.

[439] Ibid., xii-xiii.

Evolutionary continuity continues as we move to into the neuroanatomical level as well. Even at this more complex biological level of organization we find studies that demonstrate that the same relevant neurological structures subserving episodic memory are also found across a wide range of different species. According to Timothy A. Allen and Norbert Fortin, a comparative analysis of the major brain structures we encountered in the last chapter - the hippocampus, parahippocampal region, and prefrontal cortex -

> shows that this circuit is present across mammals and that a comparable circuit exists in the avian brain. Interestingly, regions that are homologous to the hippocampus also exist in reptiles and bony (teleost) fish. Considering the long evolutionary history and structure-function similarities, it seems reasonable to hypothesize that the human episodic memory circuit shares an ancestral protoepisodic memory system with other mammals and possibly birds.[440]

Additional cross-species evidence of such a neurologically deep and phylogenetically wide evolutionary continuity with regard to memory grows every year. Human beings, endowed as we are with higher order cognitive faculties like memory and consciousness, are, nevertheless, an evolved and evolving species of animal.

The apparent 'gaps' that mark human beings off as unique emerge at even higher levels of organizational complexity. Tulving's current attempts to re-

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[440] Timothy A. Allen and Norbert J. Fortin, "The Evolution of Episodic Memory," *Proceedings of the National Academy of Sciences of the United States of America*, 110 (2013): 10379-10386, 10382.

late memory and evolution are situated at the neuropsychological and behavioral levels. Here, he forwards an hypothesis.[441]

> Human beings posses a form of memory (episodic memory) and a form of consciousness (autonoetic consciousness, or 'autonoesis') that no other animals do. Thus, the thesis is that these two aspects of the mind are unique to humans, in the sense that the mental capacities that define them do not exist in quite the same full-fledged form in other species. They do not exist in insects, in birds, in mice or rats, in cats or dogs, and not even in gorillas and chimps.[442]

To support this claim, Tulving offers an extended argument elaborating the common and distinguishing features of episodic memory and semantic memory; the differences between autonoetic, noetic, and anoetic consciousness; and the singular virtues of the capacity for chronesthesia. Many of the details of his argument were rehearsed in the preceding two chapters. It is important to notice in this context that Tulving is providing an extended response to a specific set of questions posed by a fellow scientist: "Why did autonoetic consciousness and episodic memory emerge in the process of evolution? Wherein lies their evolutionary payoff? What can organisms with autonoetic consciousness do that or-

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[441] Tulving is aware that some "see this thesis as representing self-evident truth; others may think of it as woefully misguided; still others view it as little more than idle speculation that cannot possibly get us anywhere." "Episodic Memory and Autonoesis: Uniquely Human?" 5. His justification for forwarding the thesis is first, that previous debates were "formulated too broadly" and second, "we have a bit more evidence…than was available yesterday." Ibid.

[442] Tulving, "Episodic Memory and Autonoesis: Uniquely Human?" 5. Given the limited scope of this chapter and project, I will neither rehearse Tulving's full defense of this thesis, nor report on the myriad of counter examples scientists have offered from extensive observational analysis of other species. Certain species behave is ways indicative of an episodic-like capacity. See, for example, Clayton and Dickinson, 1998 and Clayton, Bussey, and Dickinson, 2003 whose research into the cache behaviors of the western scrub jay illuminates the sophistication of an avian species which is able to keep track of the what-where-when of their stored food sources.

ganisms without it cannot?"[443] Tulving's answers, in general thrust and essential novelty, will helpfully propel our discussion forward. That is, Tulving's evolutionary account of episodic memory creates a critical opening through which to consider the explicit religious relevance of our unique, adaptive ability to consciously consider future eventualities or possibilities.

Tulving begins with a necessary caveat: answering any question of "why did X evolve," even in the best case scenarios, he admits, is often a highly speculative endeavor. This is certainly true when scientists ask "about mental capacities, which do not leave any fossils".[444] Nevertheless, there is a plausible narrative to be told. "One possible story" is built upon an assumption that our early ancestors, living "some 5 or 6 million years ago," were capable of what we would currently recognize as semantic memory. They did not yet possess episodic memory, however. This capacity, Tulving speculates, "emerged, presumably gradually, in the course of human evolution" perhaps as an incremental "extension of the human mental reach farther and farther back into the subjectively apprehended past, perhaps as a sort of temporal stretching of the duration of the

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[443] Tulving, "Episodic Memory and Autonoesis," 19.

[444] Ibid. Evolutionary theorists, however, are trying to connect archeological evidence with mind/brain evolution. Steven Mithen's work, for example, not only looks at the archaic human skull fossil records, indicating the evolution of the human brain in terms of size, but he also connects such physiological changes with extant material artifacts. While "material culture and behavior - notably art, ritual and symbolism - …have been seen as no more than the products" of a larger, "new type of mind," this is, however, "only half the story: the material culture, social structures and economic patterns were fundamentally part of the new mind, they themselves were as much the cause as the consequences of new ways of thinking." Archeological evidence can therefore greatly contribute to "the study of both past and modern minds" because, according to Mithen, "by examining the archeological record we can gain a more effective appreciation of the extent to which human mental activity is dependent upon the external world." Mithen, "Mind, brain, and material culture," in *Evolution and the Human Mind: Modularity, Language, and Meta-Cognition*. eds Peter Carruthers and Andrew Chamberlain, (Cambridge, UK: Cambridge University Press, 2000), 207-217.

subjectively experienced here and now."[445] Tulving argues, albeit without offering specific examples, that there would be "clear evolutionary advantages" in being aware not only of the present moment, but also of "what happened 5 seconds ago, 10 seconds, a minute, 10 minutes, and hour, a day ago".[446] Perhaps, he muses, there was even a "special evolutionary leap" that served to propel neuroanatomical sophistication forward to allow early humans to be able to remember "across the diurnal divide". Regardless, it is a fact "that humans somehow acquired the ability to remember their experienced past, in addition to the earlier skill of knowing of things in the present."[447] The evolved capacity for episodic memory, an "expansion of the subjective time horizon toward the past," was followed by a similar, though "more muted," capacity for extending our sense of time into the future. For Tulving, this forward-looking, or proscopic reaching toward the future, was a "truly momentous development" because "it brought with it a radical shift in humans' relation to nature." Essentially, our capacity for "future-oriented thought" forms the very basis of any ability we have to harbor expectations about or make plans for tomorrow, and beyond. Tulving concludes that the capacities for episodic memory and chronesthesia allowed early humans to learn to

> use, preserve, and then make fire, to make tools, and then to store and carry these with them. Furnishing the dead with grave goods; growing their own crops, fruits, and vegetables; domesticating animals as sources

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[445] Tulving, "Episodic Memory and Autonoesis," 20.

[446] Ibid.

[447] Ibid.

> of food and clothing; creating the spirit world and endowing its inhabitants with power that explained otherwise unexplainable natural phenomena, and then inventing ways of placating the spirits through rituals and other proper ways of behavior - these all represent relatively recent developments in human evolution. Every single one is predicated on the awareness of the future.[448]

While he acknowledges that an awareness of the future is only "one of the necessary conditions that had to be simultaneously satisfied for human culture, religion, or civilization to come into being and then to proceed and flourish," Tulving posits that it seems to be "one of the more stringent ones."[449] Suddendorf and Corballis concur. In reference to the early use of fire, for example, they reason:

> Although it is difficult to identify archeological evidence for mastery of fire, one needs little imagination to envisage the huge selective advantage that it might have bestowed, in defense, attack, cooking, provision of warmth, night-time vision, and so on. Planning capacities could have been selected for as the incidental use of fire gave way to maintenance of fire and, finally, to the making of fire for more controlled and deliberate purposes. Perhaps the ancient Greeks were right: They believed that Prometheus stole fire from heaven to give humans the powers of the gods that set them apart from animals — Prometheus means foresight.[450]

Thus, the evolutionary advantage of Tulving's triad turns on the way our conscious awareness of the "existence of a future" allows us to "take steps at one point in time that would make the unpredictable, frequently inhospitable natural environment more predicable at a future time".[451] Non-human animals, by contrast, cannot "pre-experience possible happenings…cannot think about time that

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[448] Ibid., 20-21.

[449] Ibid., 21.

[450] Suddendorf and Corballis, "The Evolution of Foresight," 312.

[451] Tulving, "Episodic Memory and Autonoesis," 40.

has not yet arrived, will not initiate and persist in carrying out activities whose beneficial consequences will become apparent only in the future, at a time that does not yet exist."[452]

The amnesic cases we discussed in chapter two reveal the extent to which individuals caught within a narrow present are greatly deprived of the full human experience. For Tulving, the importance of foresight for human flourishing cannot be overstated. "When one thinks about it, it becomes clear that a staggeringly large proportion of human behavior today — social, economic, political, religious, and otherwise — is governed, both directly and indirectly, by awareness of the future."[453] Suddendorf and Corballis similarly assert that though

> we may often get it wrong, humans have in general been extraordinarily successful in foreseeing, planning, and shaping the future, and indeed allowing us to influence the earth itself in extraordinary but not always benevolent ways.[454]

It is necessary to pause here and register the fact that episodic memory is being celebrated not for its ability to excellently record the past, but rather for how it effectively prepares us for the future. This evolutionarily grounded assertion seems diametrically opposed to what most of us think memory is good for. Typically, memory in general and episodic memory in particular is valued be-

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[452] Ibid. Attentive to his critics from animal studies, Tulving suggests an experiment to test whether or not primates have the capacity for autonoetic consciousness and an awareness of the future. The details of Tulving's "spoon-test," Ibid., 43-47, are designed to see if other species have the kind of foresight that would enable them to carry a tool in order to meet a physiological need at some distant point in the future.

[453] Ibid.

[454] Suddendorf, Thomas, and Corballis, Michael C., "The evolution of foresight: What is mental time travel, and is it unique to humans?" 299

cause it is seen as the essential, mental repository of our actual experiences from the near or distant past. These memories are ours. They mean everything to us. Their loss, as in the cases of H.M., K.C., M.L., and D.B., is tragic. And yet, as we are all too well aware, even in healthy brains, memory fails us. Big infractions and small regularly occur. From forgetting someone's name or an appointment, to conflating two separate events into one, to formulating an entire childhood memory based only on what you heard your mother tell you, the failures of memory are persistent and pervasive. These 'imperfect' aspects of episodic memory have been studied by Daniel Schacter. He has emerged as an expert on memory distortion and is acutely aware that "memories are often ephemeral and distorted, on the one hand, yet subjectively compelling and influential, on the the other".[455] Like an old and faded family photograph, memory is "evanescent and incomplete, but at the same time exudes a strong emotional resonance".[456] The traces of memory, for Schacter, are "simultaneously fragile and powerful".[457] In *The Seven Sins of Memory,* Schacter writes with considerable detail about the fragile power of memory. Like the ancient seven deadly sins, each sin of memory "can be seen as an exaggeration of traits that are useful and sometimes necessary for survival."[458] Important for our purposes here, he discusses memory's *persistence*,

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[455] Memory Distortion… 1995), 20-21.

[456] Ibid., 21.

[457] Ibid., 20.

[458] Daniel L. Schacter, *The Seven Sins of Memory: How the Mind Forgets and Remembers*. (New York: Houghton Mifflin, 2001), 6.

or the imagistic and emotive resonances of memory over vast stretches of time, as well as memory's *transience*, the way memories often fade into vagueness or completely disappear.[459] These two "sins" are, in Schacter's estimation, the "most probable candidates for adaptions."[460] That is, rather than "portraying them as inherent weaknesses or flaws in system design, I suggest that they provide a window on the adaptive strengths of memory."[461] Therefore, "more adaptive than sinful,"[462] both the staying-power and tenuousness of memory have certain evolutionary upsides. With regard to the former, while "intrusive recollections of trauma can be disabling," the memories that "we wish we could forget…may one day be crucial for survival. Remembering life-threatening events persistently — where the incident occurred, who or what was responsible for it — boosts our chances of avoiding future occurrences."[463] Transience, on the other hand, is differently advantageous. Schacter reasons that while forgetting can certainly be frustrating

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[459] His complete list includes transcience, absent-mindedness, blocking, misattribution, suggestibility, bias, and persistence. While he considers the first and last 'sins' to be adaptations, the others are described this way: "I hypothesize that the remaining sins - blocking, absent-mindedness, misattribution, and suggestibility - are most likely evolutionary spandrels". That is, "[a]bsent-minded errors, misattribution resulting from source memory confusion, and related effects of suggestibility are, I suggest, by-products of adaptations and exaptations that produced a memory system that does not routinely preserve all the details required to specify the exact source of an experience. Blocking may be an incidental by-product of effects related to recency and frequency of information retrieval that also give rise to transcience. And gist-based false memories are by-products of categorization and generalization processes that are themselves vital to our cognitive function." Ibid., 204.

[460] Ibid., 201.

[461] Ibid., 6.

[462] John Sutton, Celia B. Harris and Amanda J. Barnier, "Memory and Cognition," in *Memory: Histories, Theories, Debates,* 214.

[463] Schacter, *The Seven Sins of Memory*, 187.

"it is often useful and even necessary to dismiss information that is no longer current".[464] Memory's transience, a kind of natural "forgetting over time," may "reflect an optimal adaptation to the structure of the environment" because, on balance, "when information has not been used for longer and longer periods of time, it becomes less and less likely that it will be needed in the future."[465] Understood in this way, persistence is the sin of the mnemonist; transience, of the amnesic. Neither mnemonic adaptation should operate without the other. Together, they promote survival and may even prove to be naturally salvific. Thus, we ought to consider the importance in spanning the lessons of Simonides and the insights of Nietzsche. Near the end of this chapter we will return to this crucial interaction and better appreciate how an effective interplay of persistence and transience draws us closer to what Karmen MacKendrick excellently expressed: "Mutually implicated with memory, forgetting too is constructive."[466]

These recent evolutionary considerations dramatically influence our evaluation of memory. Nature apparently values memory not because it is an accurate archive of the past but because it is an invaluable resource for future thought and action. According to Alan Richardson,

> If its function were solely to recapture the personal past as reliably as possible, episodic memory would look flawed to say the least. But if memory serves equally to help one imagine possible futures, the seeming design flaws of episodic memory might instead prove to be adaptive

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[464] Ibid.

[465] Ibid., 187-188.

[466] Karmen Mackendrick, *Fragmentation and Memory,* 26.

advantages.[467]

The episodic memory system, appreciated as Richardson suggests, is fundamentally "reconstructive" not "reproductive".[468] According to Schacter, this is beneficial because "a memory system that simply stored rote records of what happened in the past would not be well suited to simulating future events, which will probably share some similarities with past events while differing in other respects."[469] In this way, a reconstructive memory system is "better suited to the job of simulating future happenings" because such a system

> can draw on elements of the past and retain the general sense or gist of what happened. Critically, it can flexibly extract, recombine and reassemble these elements in a way that allows us to simulate, imagine, or 'pre-experience' events that have never occurred previously in the exact form in which we imagine them.[470]

The reconstructive flexibility of episodic memory stems from its intimate connection with our awareness of the future. The primary evolutionary payoff of Tulving's triad, then, is about how it effectively supports planning and thoughtful action. What makes the human animal unique is the fact that we enact intentional, voluntary, and conscious behaviors. As such, our behavioral repertoire has been formulated not just to meet present physiological needs but also to anticipate future

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[467] Alan Richardson, "Memory and Imagination in Romantic Fiction," in *The Memory Process,* 280.

[468] D.L Schacter and D.R. Addis, "The Cognitive Neuroscience of Constructive Memory: Remembering the Past and Imagining the Future," *Philosophical Transactions of the Royal Society* B 362 (2007): 773-786.

[469] Ibid., 778.

[470] Ibid.

eventualities and possibilities. Activities imbued with this kind of sophisticated intentionality and forethought are simply unprecedented in nature.[471] The mental and behavioral complexity involved means that humans are able to respond "to something that did not exist in the physical world." Consequently, for better or worse, we have been able "to create a world to fit [us], rather than live in one into which [we] had to fit."[472]

The Promethean power of foresight does have its costs, however, "not the least of which is the knowledge of inevitable death."[473] As every one of us knows, contemplating the future can be equally inspiring and terrifying. Plans, after all, are credible *and* fallible; risk assessments are reasonable *and* flawed. Human predictions rarely amount to prophecy. In the very least, considering an unknown future, for ourselves and for others, makes us anxious. Edging closer to this particular unknown, we eventually confront a vast gulf between knowing that there *is*

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[471] The fact that human beings evolved with a capacity for future-oriented thought truly changes the game. While many other species exhibit specific future-oriented behaviors e.g., migration, hibernation, food storage, etc., the type of future-oriented thought available to humans is special because it allows us an almost unbounded level of behavioral flexibility. For these researchers, there is a functional relationship between future-oriented cognition, memory, and behavior. Just as Tulving empirically linked different memory systems with different varieties of consciousness, Suddendorf and Corballis have equated the procedural, semantic, and episodic memory systems with different kinds of future-oriented cognition. And each pairing, they argue, enable various kinds of "action systems" that differ with regard to "the flexibility or response breadth they provide". "The Evolution of Foresight," 300. Procedural memory, for example, can support only a limited set of future-directed behaviors because the kind of future-oriented cognition at hand is "stimulus-bound, or better, bound to the perceptual tracking of stimuli." Ibid. The semantic memory system, by contrast, will establish a broader range of future-directed behaviors. The episodic memory system, however, in conjunction with our unique awareness of the future, establishes the greatest levels of behavioral flexibility, according to Suddendorf and Corballis. For these evolutionary theorists, human foresight supports "voluntary anticipation of any particular event" thereby allowing "us to successfully adapt to and colonize most habitats on the planet." Ibid., 311-312.

[472] Tulving, "Episodic Memory and Autonoesis," 22.

[473] Suddendorf and Corballis, "The Evolution of Foresight," 312.

a future and not knowing what that future *will be* for us. As John D. Caputo excellently parses it, the future stalks us in the present in one of two forms - as a "relative future" or as the "absolute future". Each future requires something from us. Both inspire something different in us. "For the relative future we need a good mind, a decent computer, and horse sense, those three; for the absolute future, we need hope, faith, and love, these three."[474] Faced with the absolute future, Caputo explains that

> we are pushed to the limits of the possible, fully extended, at our wits' end, having run up against something that is beyond us, beyond our powers and potentialities, beyond our powers of disposition, pushed to the point where only the great passions of faith and love and hope will see us through. With the 'absolute future,' I maintain, we set foot for the first time on the shore of the 'religious,' we enter the sphere of religions passion, and we hit upon a distinctly 'religious category.'[475]

To be grasped by, and ultimately concerned with, Caputo's distinctly religious category — the absolute future in his Derridian hands becomes an apophatic harbinger of divine impossibility — we must be able to cognitively perceive and affectively register that some absolute unknown time is always still yet to come. Speaking Caputo's theological vernacular, what Tulving's triad makes possible, is for "the name of God" to existentially reverberate as "the name of the transforming future".[476] Such an invocation, whatever its final merits, will remain unspoken, will go unfelt, unless human beings are able to appreciate the fullness of time. Without brains evolved enough for foresight, Caputo's religious category loses

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[474] John D. Caputo, *On Religion.* (New York: Routledge, 2001), 8.

[475] Ibid.

[476] Ibid., 71.

much of its religious impact. Thus, there is cause to delve further into the evolution of memory because it connects us to this and other fundamental aspects of human religiosity. The influence and impact of episodic memory can be greatly expanded. In the next section, our exploration moves to consider the collective dynamics and social relevances of remembering and forgetting for the future of religion. This will then allow us to fully situate and explore these insights within the context of Loyal Rue's naturalistic theory of religion.

## II. A Religious Future: Remembering to Perpetuate (New) Chains of Tradition

Throughout this project, we have worked to establish that episodic memory is a complex, evolved capacity enabling an expansive awareness of time and an impressive range of conscious future-oriented thoughts and behaviors. This understanding of memory will prove important for our discussion of religion below. But first, it will be helpful to balance our critical appreciation of episodic memory as it pertains to individual experience by reintroducing some of memory's wider social dynamics. As Schudson and Kansteiner informed us in the first chapter, autobiographical memories are a specific type of social memory beholden, in certain respects, to social structures, from everyday gestures to codified laws, that offer mnemonic supports to an individual living in any kind of social context. With noteworthy power and a measure of fragility, individually compelling memories are fostered and re/established, at least in part, by mnemonically rich environments and often reenforced through communicative practices. That is, individual rememberers, shaped by their social locations, use a spoken or written language to share their personal memories with others. Typically, individuals uti-

lize narrative structures based on commonly accepted standards of plausibility. In this way, episodic memories can no longer be easily portrayed as just the interior antique shows of precious personal footage and nostalgically honed images curated by and for the pleasure of one. Rather, episodic memories are increasingly touted as the socially mediated mental contents and behaviors that constitute what it means to be a person. These memories are us. They fundamentally guide the feelings, beliefs, and activities of autonomous selves as we learn from, participate in, and thereby influence our various collective contexts. This social understanding of memory - notably initiated by Emile Durkheim's student Maurice Halbwachs - marks a dramatic shift away from the inwardness tradition of memory and leads to a thorough appreciation of memory as collectively relevant.[477] Speaking of memory in social terms upends one of the common themes forwarded by those who have derided memory as either neurotically introspective or politically escapist. From psychoanalysts to activists, it has been argued, the downside of memory is its apparent tendency to encourage private or tribal nostalgic retreats into the dramas and pleasures of our individual and collective archives at the expense of all else. And yet even Augustine, an early founder of the inwardness tradition, and a creative proponent of the memory-as-storehouse metaphor, was able to venerate memory's extensive social and religious relevance as well.

Augustine gave us an early example of a thinker who found reasons to praise memory as both existentially reconstructive and a font for social cohesion.

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[477] Maurice Halbwachs, *On Collective Memory.* ed., trans., and intro. by Lewis A. Coser, (Chicago, IL: University of Chicago Press, 1992)

Surprising to some, such a twofold appreciation of memory is still necessary. Again, recall from chapter one that a major concern for the critics of collective memory studies is, ironically, its tendency to forget individuals remembers. Taking the critiques of Klein and Kansteiner seriously, then, the appropriate redress for conceptions of collective memory is to reintroduce the important lessons learned through studying individual cases of episodic remembering into the social equation just sketched without swinging the pendulum too far toward either the subjectivist or structuralist direction. A balance is required.

One effective effort comes from the French sociologist of religion, Danièle Hervieu-Léger. In *Religion as a Chain of Memory,* Hervieu-Léger argues that religious traditions have not only been beholden to individual mnemonic agents, but will survive in the future to the extant that a tradition remembers, and exploits, this fact. Explicitly influenced by Halbwachs's work, and implicitly attuned to memory's inherent reconstructiveness, Hervieu-Léger would certainly agree that collective memory is

> not a given but rather a socially constructed notion….It follows that there are as many collective memories as there are groups and institutions in society. Social classes, families, associations, corporations, armies, and trade unions all have distinctive memories that their members have constructed, often over long periods of time. It is, of course individuals who remember, not groups or institutions, but these individuals, being located in a specific group context, draw on that context to remember or recreate the past.[478]

She employs the image of a chain to indicate the connection an individual believer makes when she or he "becomes a member of a community, a community

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[478] Ibid., 22.

which gathers past, present, and future members"[479]. The "chain of memory" is an apt expression for religious affiliation in particular for a number of reasons. According to the metaphor, individual adherents self-consciously choose to link up with the longstanding beliefs and practices of a religious tradition. The tradition is thereby given implicit and explicit authority over an individual's thoughts and actions. Individual believers, in turn, reorganize their self-understanding and behavior in connection to a tradition's understanding of itself through time, all the while collectively conjoining their memories of the journey with others to effectively reshape the tradition itself. This chain of memory constitutes what Hervieu-Léger refers to as a "lineage of belief".

> In the case of religious memory, the normativity of collective memory is reinforced by the fact of the group's defining itself, objectively and subjectively, as a *lineage* of belief. And so its formation and reproductiveness spring entirely from the efforts of memory feeding this self-definition. At the source of all religious belief, as we have seen, there is belief in the continuity of the lineage of believers. This continuity transcends history. It is affirmed and manifested in the essentially religious act of recalling a past which gives meaning to the present and contains the future.[480]

In contrast to stale or antiquated understandings of what defines and sustains a religion, then, Hervieu-Léger turns to the dynamics of memory to newly appreciate its vital brand of continuity and social relevance though time. In the spirit of Halbwachs, her portrayal enlivens the notion of tradition by studying instances where it manifests itself as a particular kind of shared memory, a memo-

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[479] Danièle Hervieu-Léger, *Religion as a Chain of Memory.* trans. Simon Lee, (New Brunswick, NJ: Rutgers University Press, 2000), ix.

[480] Ibid., 125.

ry interestingly attuned to various collective contexts and increasingly responsive to societal changes. No longer approached as a fixed set of beliefs and practices regressively linked to a distant past, Hervieu-Léger's approach to tradition in this text, is decidedly less traditional, more creatively engaged in the present and fluidly open to the future. She studies how religious traditions in general and French Catholicism in particular have retained or may reestablish their authority in the future by enacting a living continuity between the past and present whereby "the creative power of tradition" effectively responds to social change, perhaps even "as a force for renewal."[481] The essential medium for this kind of transformation resides in individual rememberers themselves. She explains that currently

> individuals are adrift in a universe without fixed bearings….Self-fulfillment is now the chief aim, the subjective unification of fragmented experience that corresponds to different sectors of activity and different social relations. Given such a context, the deliberate choice of invoking the authority of a tradition, by becoming incorporated into a continuing lineage, constitutes one possible, post-traditional way of constructing self-identity among others, all of which call upon an individual's affectivity and are fed on his or her search for community, and his or her memories and longings.[482]

What makes Hervieu-Léger's analysis compelling is not only her affirmation of individual mnemonic agency but also her assertion that there is a "structural connection" between memory and religion.[483] Every religion, she claims, is in the business of effectively mobilizing collective memory.[484] Before modernity, in

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[481] Ibid., 86.

[482] Ibid., 165.

[483] Ibid., 124.

[484] Ibid.

more traditional societies - where individuals seemed to hold a religious perspective in common - memories were “totally contained within the structures, organization, language, and everyday observances” of the group.[485] In this way, religious collective memory, like other forms of cultural memory, “functions as a regulator of individual memory at any one moment. It even takes the place of individual memory whenever it passes beyond the memory of a given group and the actual experience of those for whom it is a reference.”[486] This supplanting of individual memory by collective memory largely defined traditional societies, according to Hervieu-Léger. However, even when these groups began to lose their hegemonic control of all things mnemonic, and a group memory was subjected to “constantly reoccurring construction” by individual mnemonic agents, collective memory in such “differentiated societies” could still remain “essentially normative”. But, according to Hervieu-Léger’s analysis, the current so-called ‘secular’ context appears to be quite different. Most contemporary Western societies, she argues, are not merely differentiated but irreparably fractured. It is a wonder that contemporary individuals are able to find contexts conducive to generating and nurturing shared memories. Hervieu-Léger’s entire project appears to be motivated by one question: can individuals today even reconstruct mnemonic chains to a shared past or are such links simply impossible, currently broken beyond repair?

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[485] Ibid

[486] Ibid.

This is an urgent question for many philosophers of memory, particularly for those unnerved by the rampant forgetfulness apparently engendered by technological advancements and global capitalism. For instance, Edward Casey's phenomenological study of memory is necessary, he argues, because we live in an increasingly amnesic age. According to Casey, too many among us have forgotten how to remember or even why we should remember in the first place. The primary task of memory philosophy, then, is to redress "the amnesia of anamnesis".

> The fact is that we have forgotten what memory is and can mean; and we make matters worse by repressing the fact of our own oblivion. No wonder Yates can claim that 'we moderns have no memories at all.'[487]

Casey puts his finger on something important. The driving impulse of his work echoes that of Pierre Nora's - one of the primary catalysts of the upsurge in the recent interest in memory. Like Casey, Nora felt similarly justified in producing his voluminous project, *Les Lieux de Memoire. "*We speak so much of memory because there is so little of it left."[488] The cause of this collective mnemonic decline is obvious to Casey. Barely able to suppress a righteous distain for our current technological idolatry, he laments how ancient deities of memory have been supplanted by a roguish cadre of upstart machines, the mechanical brain-children of start up wizards.

> Where once Mnemosyne was a venerated Goddess, we have turned over responsibility for remembering to the cult of the computers, which serve as

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[487] Edward S. Casey, *Remembering: A Phenomenological Study*. (Indianapolis, IN: Indiana University Press, 1987), 2.

[488] Pierre Nora, "Between Memory and History: *Les Lieux de Memoire*," 7.

> our modern mnemonic idols….The memory of things is no longer in ourselves, in our own discerning and interpreting, but in the calculative wizardry of computers.[489]

While computers - or any number of small, sophisticated electronic devices currently affixed to nearly every person on the planet today - bear some responsibility for outstripping or outsourcing our memories, they are not the only culprits behind memory's decline. Cultural theorists and scholars of collective memory have pointed to a number of other societal forces that have apparently exacerbated our collective forgetfulness, or have at least have undervalued memory, helping to create what Radstone and Schwarz refer to as our "social amnesia". According to these thinkers, forgetting *en masse* may indicate that our "organic memory" has been "destroyed by the transmissions of new media technologies" or is, perhaps, the cumulative result of late capitalism's "commodification of the past".[490] In Nora's estimation, the "real environments of memory" were once located in "peasant culture, that quintessential repository of collective memory". Tragically these cultures have largely disappeared, casualties of modernity's extensive industrial growth.[491] Whatever its specific causes, all agree that "we, as modern subjects, are cut off from the pasts that have created us."[492]

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[489] Casey, *Remembering*, 2.

[490] Radstone and Schwarz, "Introduction: Mapping Memory," in *Memory: Histories, Theories, Debates,* 2.

[491] Nora, "Between Memory and History," 7.

[492] Radstone and Schwarz, "Introduction: Mapping Memory," 2.

Hervieu-Léger concurs. She argues that “one of the chief characteristics of modern societies is that they are no longer societies of memory”.[493] In fact, the “more advanced societies are those in which one no longer finds even a minimal continuum of memory”.[494] Her concern is to understand how “the crumbling memory of modern societies” effects the sociological study of religion and religious traditions.[495] For Hervieu-Léger, then, the so-called ‘secularization of the West,’ if anything meaningful can still be gleaned from the use of that phrase, has everything to do with the ways our inherently “amnesic societies” exacerbate collective forgetting and fundamentally impact the future of any religious tradition.[496] Like other recent scholars of religion, Hervieu-Léger is therefore firmly vested in assessing modernity’s effects on religious belief and practice. However, unlike many others, she does not automatically assume that modern individuals are more rational and, thus, less religious. Rather, her operating assumption is that people are probably as religious as ever, but that contemporary Western societies are less self-evidently religious precisely because they are increasingly inhospitable to remembering the past, any past. While the reasons for our social amnesia are myriad, as was briefly noted above, for Yerushalami, this forgetfulness of the past - this break in the chain - is surely a failure of modern life. “What we call ‘forgetting’ in a collective sense occurs when human groups fail —

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[493] Hervieu-Léger, *Religion as a Chain of Memory,* 123.

[494] Ibid., 128.

[495] Ibid., 127.

[496] Ibid., ix.

whether purposely or passively, out of rebellion, indifference, or indolence, or as the result of some disruptive historical catastrophe — to transmit what they know out of the past to their posterity."[497]

Hervieu-Léger's attention to memory, the *fil conducteur* of her project, therefore serves to highlight its potential influence and leavening power within the intersecting scholarly concerns surrounding societal fragmentation and the uncertain future of religion.[498] Generations of sociologists, with a pronounced confidence passing as conventional wisdom, presumed that the decline of religion was inevitable. However, "for all the evidence of the fragmentation of religion in modern society," Hervieu-Léger explains, "it has to be recognized that religion still makes itself heard, though not always where one expects to hear it." As she sees it, religion

> makes its presence felt implicitly or invisibly throughout the gamut of human expression. Thus instead of thinking of a dwindling religious domain (the institutions of traditional religion) set against the domains of politics, aesthetics, therapy and so on, one should look for covert signs of religion in every sphere of human activity. The problem is to know how far to conduct the investigation.[499]

For Hervieu-Léger, the marginalization of religion in modern Western societies does not amount to a simple decline or disappearance but rather to its deceptive

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[497] Yerushalami, Zakhor, 109.

[498] In Hervieu-Léger's text, secularization is not a rigorously defined term. It is narrowly used in this context in connection with that about contemporary Western society (Western often meaning French and Catholic) which impedes the current maintenance or future transmission of collective memory. Such mnemonic achievements are what religious traditions do best, according to Hervieu-Léger.

[499] Hervieu-Léger, *Religion as a Chain of Memory,* 29.

dissolution and reappearance. Religiosity, like energy itself, cannot be destroyed but merely changes form. Religious feelings, thoughts, and behaviors continue to emerge in unexpected ways and in unexpected arenas. Mnemonic dynamics - whether through active remembering or needful forgetting - will continue to re-shape religious traditions now and in the future. While memory can inextricably chain us to our pasts, "any collective memory…forms and endures through the processes of selective forgetting, sifting and retrospectively inventing."[500] Thus, collectively, we must sometimes forget so as to remember to perpetuate new chains of religious memory. Hervieu-Léger is absolutely right to insist that the future viability of any religious tradition lives or dies on its ability to reestablish a continuity with the past. Memory can do this work. But she does not say precisely how. Thus, we will benefit from Loyal Rue's understanding of the structure, functions, and substance of religion as we keep attuned to memory's potential role and meaning within all of it.

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[500] Ibid., 124.

According to Rue, stories are the vital, substantive heart of religion, and his general,[501] naturalistic[502] model claims that all religions[503] harbor an integrated narrative core.[504] Religions, he argues, root themselves around organizing myths that incorporate both cosmological ideas about what the world is ultimately like and moral ideas about what things ultimately matter.[505] We will return to discuss Rue's sense of this core in the final section. To support the individual appropriation and collective perpetuation of these formative stories, religions have developed a variety of enabling strategies. Rue identifies five such modes and refers to intellectual, institutional, ritual, experiential, and aesthetic endeavors and events as the "ancillary strategies" that support the collective growth of a reli-

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[501] Loyal Rue, *Religion is Not about God: How Spiritual Traditions Nurture Our Biological Nature and What to Expect When They Fail.* (New Brunswick, NJ: Rutgers University Press, 2006). "By a *general* theory I mean one that tells us what religion is, where it comes from, and how it functions. General theories are premised on the belief that universal properties of structure and function can be found lurking behind the varying details of religious phenomena. The goal of a general theory is to show that all religious traditions may be seen as particular variations on a set of common themes." 2. For his expanded explanation and defense see, 4-11.

[502] "By a naturalistic theory I mean one that reduces religious experiences and expressions to the status of natural events having natural causes. As such, a naturalistic theory of religion seeks to understand religious phenomena by using categories, concepts, principles, and methods compatible with the ones normally applied to non-religious domains of human behavior." Ibid. An expanded defense and explanation can be found on, 11-17.

[503] "Briefly stated, the central claims are: First, that it is possible to construct a satisfying general account of religion; and second, that this can be done without invoking supernatural principles of explanation." Ibid. 2.

[504] Ibid., 126-128.

[505] "When the root metaphor of a mythic tradition is ingested, one apprehends that ultimate facts and values have the same source. In mythic insight, the ultimate explanation is also the ultimate validation. The root metaphor renders the real sacred and the sacred real. The force of the naturalistic fallacy - the separation of facts and values - is dissolved by the metaphors that generate truth." Ibid., 127.

gious tradition.[506] Each strategy is not only "designed to assure the narrative core will continue to be replicated indefinitely in the minds of individuals,"[507] but all five will even "provide the means by which a religious tradition may flourish".[508] The twofold narrative core in conjunction with these five strategies of reinforcement form the common structure of all religions. Rue is quick to point out, however, that in any given religious tradition or sub-tradition, the ancillary strategies do not necessarily emerge as equally efficacious or valuable. For instance, "some traditions may emphasize intellectual aspects but downplay aesthetic aspects, while others may invest themselves in ritual strategies but less so in institutional structures".[509]

Without being able to draw on various mnemonic dynamics and processes, I submit, none of Rue's ancillary strategies of maintenance and perpetuation will have much lasting impact. That is, nothing said, written, or done in the past, and nothing proclaimed, practiced, or made in the present, will be handed down to the next generation of believers in any tradition without memory. No meaningful story, ritual behavior, exceptional place, or revered artifact will escape from oblivion unless it is somehow remembered by some critical subset of adherents.

To a certain extent, and in certain moments, Rue acknowledges this fact. For instance, his explication of Judaism underscores how one aspect of its intel-

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[506] Ibid., 128-144.

[507] Ibid., 126.

[508] Ibid., 128.

[509] Ibid.

lectual strategy includes an extensive history of and a current appreciation for the practice of “knowing the Law, and remembering it” as “an absolute prerequisite to obeying the Law.”[510] Moreover, in keeping with the reconstructive nature of memory,

> It is not so simple a matter as committing to memory the 613 laws specified in the Torah. This is never discouraged, of course, but it is never sufficient. To understand fully the meaning of these laws and what is implied by them, and then to figure out how they apply to the many particular situations of human life — all of this requires careful study, reflection, analysis and interpretation.[511]

In Christianity, to take an example from another tradition, remembering is exceedingly important to that tradition’s experiential strategies. In Rue’s estimation, this manifests within two prominent models of the spiritual life. One, akin to William James’s notion of “once-born,” describes the spiritual journey as a process of “continuous growth” in the form of repeated daily prayers and “various mediation techniques as ways of producing experiential apprehensions of God”. Over time these activities help practitioners achieve “a deeper sense of realism” about Christianity’s core myths thereby strengthening “the biases of memory systems such that appraisals and coping events will be more likely to reflect the Christian pattern of piety.”[512] The other model, what James referred to as “twice-

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[510] Ibid., 180.

[511] Ibid.

[512] Ibid., 211.

born," is a spiritual journey "marked by dramatic change."[513] As we saw with Augustine's personally redemptive tale in the garden,

> The pattern of such conversion experiences is to pass through a spiritual crisis during which one's entire life provokes disgust, but then suddenly the torment passes and the individual emerges with a completely new and exquisitely integrated perspective. The despair of the sinner gives way to the joy of the saved. The salient feature of such conversion experiences is that the newly integrated person adopts a completely new goal hierarchy.[514]

The preservation of this new hierarchy, not to mention the possibility that it be occasioned in the life of another person through proselytization, necessitates that the conversion narratives of the twice-born be told again and again. In this way, the religious conversion, "like other extraordinary experiences," can condition the appraisal and coping processes" of individual adherents "by playing on the bias of working memory to retrieve information marked with strong affective valances"[515] of a fundamental experiential principle of "disintegration (spiritual death) followed by reintegration (spiritual rebirth)."[516]

For Muslims, the ritual strategy of repetitive action serves to fundamentally connect and shape the memories of its practitioners. Of the "five pillars" of the Islamic faith, daily prayer definitely "exploits the biases of human memory systems" by proscribing in detail the times of day a prayer should be offered, how the participant should prepare to enter into prayer, in which direction the practi-

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[513] Ibid.

[514] Ibid., 212.

[515] Ibid., 213.

[516] Ibid., 212.

tioners should be facing and why, and what should be said and done during each prayer. In all of these ways, the ritual strategy of prayer, when consistently practiced, will ensure that a Muslim remembers what Muhammad taught: prayer is "the centerpiece of Islam, the one act that God loves above all others."[517]

The ancillary strategy with considerable mnemonic resonances in Hinduism is aesthetic. Through poetry, visual art, and dance this tradition embodies a vital, reconstructive openness toward creative engagements with its historically formative literature, images, and movements. According to Rue,

> Hindu art, generally speaking, prefers refinement over realism, elaboration and embellishment over imitation. This aesthetic ideal is consistent with the Hindu ethos that the central task of human existence is to refine or purify the self. Nature is to be perfected by culture, life is to be corrected by discipline.[518]

Thus, in Hinduism, one can, for example, find individual artists, through various media, actively remembering and newly presenting their responses to the *Gita Govinda* or the *Bhagavad Gita* in "painting, drama, dance, sculpture, and more poetry."[519]

In his analysis of Buddhism, Rue indicates how memory helps to support an institutional strategy of establishing an important demarcation between monks and laity. To fashion a coherent community, or sangha, Buddhists have had to create a comprehensive institution able to include both. As Rue explains,

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[517] Ibid., 236.

[518] Ibid., 274.

[519] Ibid., 275.

> Originally, the sangha was composed of Buddha groupies, those who undertook the life of homeless wanders in order to follow the Buddha and embody his teachings. After the Buddha's death, and as the assembly grew and diversified, there was a need to formalize a code of discipline to maintain the solidarity of the sangha. The introduction of a monastic code (*vinaya*), together with standards of ordination, established a distinction between monks and laity.[520]

While this distinction, and the often fraught interactions between the two groups, has proved contentious over the centuries, the need to faithfully recount and effectively hand down the Buddha's teachings has relied on institutional memories "designed to manage the interpretation, transmission, and embodiment of a mythic tradition."[521] Other examples could be offered from each tradition, but even this small sampling helps to make the point that memory plays an important role in the maintenance and perpetuation of any religious tradition.

To be clear, as Rue announces at the outset of his book, religion, according to his account, is not about God, the ancillary strategies are

> about manipulating our brains so that we might think, feel, and act in ways that are good for us, both individually and collectively. Religious traditions work like the bow of a violin, playing upon the strings of human nature to produce harmonious relations between individuals and their social and physical environments.[522]

The trans/formative effects of Rue's five ancillary strategies, he argues, function in pursuant of two broad goals - personal wholeness and social coherence.[523]

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[520] Ibid., 302.

[521] Ibid., 303.

[522] Ibid., 1.

[523] Ibid., 10.

Rather than attempt to constrain what he sees as the "twin-teloi"[524] of the religious life within geographical, cultural, or otherwise socially circumscribed constructions of meaning, Rue posits that the goals of personal wholeness and social coherence are humanity's version of what it means to "maximize reproductive fitness."[525] According to Rue,

> The general strategy of our species is to achieve personal wholeness and social coherence - that is, to develop healthy and robust personalities while at the same time constructing harmonious and cooperative social groups. To the extent that we succeed in these vital projects, we enhance our prospects for reproductive fitness. For other species the strategies will be slightly or vastly different, but for humans the name of the game is personality and sociality.[526]

Religion is one of the central ways human beings have sought to achieve these ends. And any religious tradition, at its best, has been able, in certain respects, to adaptively channel human animals toward our therapeutic and political flourishing with recourse to the mythic core narratives they espouse.[527] "These shared traditions of meaning tell us who we are, where we come from, and how we should live. They give us an orientation in nature, society, and history, and thus provide us with resources to negotiate our way through the many challenges to a full life."[528] As was demonstrated with the ancillary strategies selectively presented

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[524] Ibid., 122.

[525] Ibid., 9.

[526] Ibid.

[527] "Indeed, it is difficult to escape the more general point that the entire language of theology is absorbed without a trace into the vocabulary of therapy and politics." Ibid., 161.

[528] Ibid., 9.

above, Rue expends considerable effort and space delineating how the core myths of each tradition respectively influence those who remain fervently convinced by and beholden to their veracity and power. However, like Hervieu-Léger and other social theorists sensitive to modernity's adverse effects on religious affiliation, Rue recognizes that the ability of these ancient stories to ultimately grasp contemporary individuals is on the decline. This "crisis of influence" threatens to sunder the once self-evident fusion of ultimate fact with ultimate value engendered by a tradition's integrative mythic core.[529] Rue aptly captures the cascading decline this way:

> If my realism about the root metaphor of a myth is compromised, then the fusion of reality and value is compromised; if my sense of the objective reality of certain prosocial values is compromised, then the linkage of those values to my self-esteem will be compromised; if my self-esteem is de-linked from certain values, then the power of these values to command a hearing in working memory will be compromised; and if the values in question fail to gain a hearing in working memory, then they cannot influence the manner of my appraising and coping with any business at hand.[530]

For many contemporary individuals, one of the major protagonists of religion's loss of influence has been the rise of the natural sciences. Relatively plausible cosmological theories have put the mythic accounts of reality found in ancient scriptures on its heels, if not on its head. Relatively reliable evolutionary theories of human origins and developments have upended the mythic accounts of who in the world we are and what we are here for. In Rue's view, and with a growing

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[529] In the title of an earlier book, Rue gives our individual loss of mythic foundation a name. See *Amythia: Crisis in the Natural History of Western Culture*. with a foreword by William G. Doty. (Tuscaloosa: University of Alabama Press, 1989)

[530] Ibid., 315.

number of other contemporary scholars of religion, there may be a spiritually compelling and scientifically consistent integrative narrative core to be rewritten from the perspective of religious naturalism.[531]

### III. On Mnemonic Grounds: Tracing the Theological Resonances of Religious Naturalism

Definitions of the word 'religion' are always provisional, contestable. One of the virtues of Rue's perspective is that his definition of religion includes functional, structural, and substantive aspects. The former were discussed above while an exploration of the latter has been largely deferred until this final section. The religiously substantive dimension of Rue's theory is the very content found in the integrated narrative core.[532] This core is integrated in the specific sense that cosmology and ethics are jointly accounted for and effectively held together by a religion's founding myth. In the Abrahamic traditions - Judaism, Christianity, and Islam - the central myth and root metaphor is God-as-person while underlying much of Chinese myth, for example, it is the Tao. For religious adherents, the myths of their given traditions are never 'just stories,' but rather the *only* story true enough to effectively inform them of what in the world is real, what in them is worthy and lasting, and how they should think, feel, and behave for all time and in all places. For those convinced of its substance, the integrated narrative core will, inevitably, have functional consequences.

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[531] Ibid., 362-367.

[532] Ibid., 127.

Rue can forward this nuanced and layered definition of religion, he argues, without necessarily being "hostile to the idea of God."[533] According to his general, naturalistic portrayal, the

> question of God's existence simply doesn't come into the business of understanding religious phenomena. Both the existence and the non-existence of God are perfectly consistent with the claim that religion is essentially about fiddling on the strings of human nature.[534]

This seems straightforward enough, and he commendably continues in an apophatic vein, writing:

> There is much to be said for the thesis that all theological formulations are equally and utterly dubious for the simple reason that God is inscrutable. The measure of a religious orientation is therefore not whether it gives an accurate account of divine reality, but whether it effectively manages human nature.[535]

Rue, as if channeling one who disagrees with him, immediately follows these sentiments with a rejoinder. "It could be argued, of course, that religion would lack the power to manage human nature unless it is believed to offer truths about God." To this point he finally, unsatisfyingly, concludes:

> This may be the case, but even so, it is easy to see that *belief* is the thing, not the reality of any object of belief. The religious question, then, is completely independent of the theological question.[536]

On his last point, I am not so certain. While entirely agreeing with his apophatic approach, I am still left wondering: are theological questions and religious ques-

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[533] Ibid., 2.

[534] Ibid., 3.

[535] Ibid.

[536] Ibid.

tions really as easy to separate as Rue seems to indicate? Is 'belief' only an answer to theological questions and not to religious ones?[537] It seems, for the religious naturalist at least, that to concede as much would be to give the entire game away. It is warranted, I submit, and perhaps preferable to some contemporary individuals, to argue that what undergirds Rue's entire project - his appreciation for and sustained elaboration of the ways the evolutionary bow has fiddled on the strings of human nature - is itself replete with theological resonances. Could his own account be understood as an accurate account of a divine reality, an account that is still not about God? There are other religious naturalists who have claimed as much.[538] After all, is not the "epic of evolution,"[539] as Rue refers to it, construable as a founding myth? Why, for example, laud human beings, and every other living organism for that matter, as "star-born, earth formed, fitness

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[537] Belief, it seems, would have different connotations and plausibility parameters depending on which ancillary strategy it finds itself in. To believe in a doctrinal pronouncement about the nature of being of God in an intellectual strategy, for example, would mean something entirely different from believing in the affective charge one receives while listening to a recitation of the Koran.

[538] Some examples of spirituality inflected religious naturalism include: Thomas Mary Berry, *The Great Work*. (New York, NY: Three Rivers, 1999); Donald A. Crosby, *Living With Ambiguity: Religious Naturalism and the Menace of Evil.* (Albany, NY: 2008); Ursula Goodenough, *The Sacred Depths of Nature.* (New York, NY: Oxford University Press, 1998); Michael Houge, *The Promise of Religion Naturalism.* (Latham, MD: Rowman & Littlefield, 2010); Karl Edward Peters, *Dancing With the Sacred: Evolution, Ecology, and God.* (Harrisburg, PA: Trinity, 2002); Chet Raymo, *When God is Gone, Everything is Holy: The Making of a Religious Naturalist.* (Notre Dame, IN: Sorin Books, 2008); John R. Shook and Paul Kurtz, *The Future of Naturalism.* (Amberst: Humanity Books, 2009)

[539] Ibid., p. 21-27.

maximizing biochemical systems" without also being willing to intone some arias of sacred reverie?[540]

My desire to invoke the theological resonances of an evolving nature has been carried along an arduous path. The engagement with mnemonic traces attempted in this project - a scientifically based, multi-narrated account of the width and depth of episodic memory - has been clamoring to express something of the religious ultimacy of the one nature that is all there is. Memory is my chosen, illustrative path through which to glimpse the ways and means of a scared reality not simply because it has been venerated in the past by a whole host of thinkers, but because it uniquely embodies something of the deep continuity and ever-expanding associations in our beautifully fragile existence. To better express the vital brand of unity I have endeavored to build on mnemonic grounds, I will briefly turn in the closing moments of this project to the insights of Carl Craver and Lawrence Cahoone.

Craver, a philosopher of science, offers a brilliant way to integrate our multi-faceted portrayal of memory. Bickle's categorization of the four major levels of biological organization are affirmed, but importantly conceived by Craver as dynamic mechanisms. His aim is to focus on mechanisms in order to establish a philosophically savvy kind of explanatory unification of neuroscientific inquiry. The details of Craver's work are beyond the scope of this chapter. However, even a

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[540] Ibid., 26. To be fair, Rue, in another book, offers a more poetic, almost reverent, rendition of the epic evolutionary tale we all are characters in. See *Everybody's Story: Wising Up to the Epic of Evolution*, with a foreword by Edward O. Wilson. (Albany: State University of New York Press, 2000)

cursory glimpse at the way he frames the scientific study of memory is beneficial. First, Craver finds the term “level” to be “multiply ambiguous.”[541] He therefore prefers to speak of “mechanisms” and “levels of mechanisms”. According to Craver, a mechanism “is a set of entities and activities organized such that they exhibit the phenomenon to be explained.”[542] Take, for example, the neurobiological account of long-term potentiation from Chapter 3. What transpires between presynaptic and postsynaptic neurons with regard to stimulating the presynaptic release of glutamate and the subsequent cascading molecular events eventually leading to an influx of calcium ions into the postsynaptic cell thus depolarizing it is an example of a mechanism.[543] Other mechanisms can be identified at the same level and at other levels of analysis. In fact, neuroscientists are in the business of experimentally locating and understanding mechanisms wherever and however they may be found.[544] Many philosophers and neuroscientists have erroneously assumed, however, that the goal and virtue of this search is inherently reductionistic. That is, proponents of reductionism are “fundamentalist” thinkers who “demand that neuroscientific explanations bottom out in some privileged set of entities or causal relations.”[545] This bottoming out can take several forms from

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[541] Craver, *Explaining the Brain*, 163.

[542] Ibid., 5.

[543] Ibid., 65-72.

[544] Ibid., 2-16.

[545] Ibid., 11.

the behavior of neurons to the movements and changes of molecules.[546] Craver, by contrast, defends "the explanatory relevance of nonfundamental items"[547] not only in order to affirm what neuroscientists already do, but also to suggest a fully integrative model of neuroscientific study across all relevant levels. He writes:

> The suggestion is not merely that the central nervous system *can be* ex plained at different levels, but that an adequate explanation of many phenomena in the central nervous system *must* bridge phenomena at multiple levels. Judging from statements of this sort, there is no *single* neural level, or neurophysiological level, or neuroscientific level of explanation. Neuroscientific phenomena span a hierarchy of levels from the activities of molecules to the behaviors of organisms.[548]

The unity of the neurscientific analyses of memory, therefore, does not amount to a rigid whole reductively grounded and necessarily preoccupied by establishing the lowest, supposedly foundational, mechanism residing beneath it all. Rather, the vibrant unity Craver offers is akin to a mosaic. Different mechanisms and levels of mechanisms are pieced and patched together to create a strong, adjustable scaffold of inquiry and experimentation. Investigators at each and every level, and within the same level, can fluidly interact and mutually influence one another. In particular, these interactions are shaped by the creation of empirical constraints. As research proceeds to uncover the intricacies of one mechanism, for example, it will inevitably establish parameters that constrain, without determining, what other strands of research should endeavor to explore further. Within this mosaic unity, each neuroscientific discipline retains its autonomy while still

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[546] Ibid.

[547] Ibid., 13.

[548] Ibid., 10-11.

being able to formatively influence the experimental direction of the neurosciences as a whole.[549] Looking at the scientific study of memory, Craver's notion of inter- and intralevel constraint has been historically demonstrated. For example, when Scoville and Milner's work with H.M. found that "memory is not a single kind of thing, but a collection of loosely related phenomena,"[550] it both opened the door to new experimental possibilities and narrowed memory research to focus on the hippocampus. Constraints, then, are the avenues to other vistas of knowledge and further query. And, without the reductive demand to report that one thing, such as memory, is nothing but its smallest, identifiable mechanism, like LTP, the mosaic unity Craver espouses instead allows our scientific understanding to open up and move ahead in the ways that it will - unevenly, incrementally, fitfully - both from the bottom up or from the top down.

Craver's model is more than an proscriptive guide for neuroscientists. His mosaic imagery mirrors the go of nature. The term 'nature' does not refer to one thing and is not beholden to one mechanism. 'Nature' is a general name for that within and around us which constantly moves and reconstitutes itself. For Lawrence Cahoone, like other religious naturalists, nature is appreciated as a perpetually shifting, fitfully adjoining consortium of orders, not levels.[551] His Buchlarian inflected metaphysical rendition of the one nature that is all there is is Craver's mosaic writ large. As Craver's perspective suggests about the neuro-

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[549] Ibid., 231

[550] Ibid., 261.

[551] Lawrence Cahoone, *The Orders of Nature*. (Albany, NY: SUNY Press, 2013)

sciences in particular, Cahoone's affirms about nature in general, namely, there is an inherent plurality of interactive orders operating within a wider whole. Confronting the reality that nature is not simply one thing, but many things, activities, and orders, Cahoone still challenges those who assert that "this diversity shows the search for a general description is wrong-headed". Instead, he acknowledges that even as it "is true that we cannot expect a final unity" what we find "between fragmentation and unification…are many degrees of relation and an overlapping patchwork."[552]

Episodic memory, from a religious naturalist perspective, is a complex order of nature. It harbors, as we have taken pains to show, numerous levels and levels of mechanisms - from molecular events, to neurological processes and a conscious awareness of the future, to deliberate action. Through objective research, establishing that mnemonically relevant molecular actions and neurological structures can be found in many other species evolutionarily appreciates memory from that deepest and oldest of natural narratives of which we are a part. By exploring the subjective uniqueness of episodic remembering and our ability to recognize that a future time is yet to come suggests that episodic memory, chronesthesia, and autonoesis may provide a meaningful, even religious, glimpse of ourselves as precariously related to each other and the world. As Rue's work invites us to do, invoking an integrated heart of religion on mnemonic grounds tells this very tale of "how we came to be and how we carry on."[553] My

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[552] Ibid., 3.

[553] Rue, *Religion is Not about God*, 78.

elaboration of the science of episodic memory is but one chapter of the religious naturalist story. Our mnemonic brains have come to be through evolution. And, according to our particular adaptive mnemonic inheritances, we will carry on despite not knowing what the future will be for us and for our world. According to the wisdom of Simonides, this carrying on will mean deliberately, constantly, and consciously remembering ourselves as ones charged with rescuing others from being lost. According to the insights of Nietzsche, we, as individuals and collectively together, are sometimes better off when we forget. In these ways, we may be saved, and we may save others in return. Our redemptive hope is twofold - to individually trust the equally natural retentions and dissolutions of memory while collectively enacting wise practices to discern what is best retained and what is better to let go of. Active remembering and needful forgetting are potentially salvific affordances bestowed upon us from the one nature that is all there is. As my religious naturalist vision is beginning to see more clearly, this names something of the complex, interactive, and contestable myth at the heart of my therapeutic and political explorations of memory.

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