

Embodied Memory: Aging, Neuroculture, and the Genealogy of Mind

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THIS ARTICLE EXPLORES THE RELATIONSHIP BETWEEN THE AGING MIND AND COGNITIVE CULTURE, with a focus on the production and distribution of memory as a master metaphor for successful aging. In using the term “cognitive culture” I refer to the ethical, scientific, technological, artistic, social, commercial, and professional forces gathering in response to the contemporary problematization of memory loss. It is a *culture* because the cognitive field, while dominated by the neurosciences, also extends to business, industry, insurance, economics, the military, the arts, pharmacology, and education and has created newly hybridized “neuro” disciplines, products, and social values (discussed below). To explore this relationship, I look at the historical articulation of aging, memory, self, and body in the narratives and politics of life that now constitute our present. Inspiring my thinking is Michel Foucault’s genealogical approach to the “history of the present,” which finds the contingent moments that constitute contemporary society “in the most unpromising places” and, set apart from mainstream traditions, operates “on a field of entangled and confused parchments.”¹ In this sense, a genealogy of the aging mind would question why, at special

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moments, certain disparate knowledges and entangled documents about memory and aging punctured the lure of continuity and assumed the status of scientific truth.

The first part of this paper looks at three such moments that created enduring ideas about what aging memory means: (1) the classical *ars memoria* (art of memory), (2) John Locke's philosophy of continuous memory and personhood, and (3) nineteenth-century models of brain localization. The second part addresses some of the consequent neurocultural imperatives driving our current thinking about memory and the aging brain. Concluding remarks go out on a limb to ponder the significance of forgetting. The rationale for the selection of these historical moments and cultural issues is the conviction that behind our current neuroscientific and cognitive cultures surrounding aging lie the discourses and metaphors by which Western thought has historically individualized memory as the guarantor of civilized personhood. Furthermore, how we articulate the relationship between memory, aging, and personhood has practical consequences for our cultural narratives about healthy and successful aging.

THE ART OF MEMORY (*ARS MEMORIA*)

The first philosophical treatment of memory and mnemonics is credited to Aristotle. It is interesting to note that, in his treatise *On Memory and Reminding Oneself*, Aristotle claims that memory is poor in both the young and the old, since both “are in a state of flux,” causing their restless bodies to become obstacles to good memory.² Aristotle outlines mnemonic exercises involving the superimposition of a set of images over a set of places, so that in such schemes each place is a symbolic part of a larger spatial order of recall. This idea, that one can “run through” a set of mental places in a routinized order to evoke a memory, surfaces in mental exercises up until the early twentieth century. But Aristotle also poses questions about memory that we still ask today. What is actually remembered in memory? How do memories come into our minds? How is memory physical, emotional, and spiritual? And how do changes in the aging body affect the mind? As for Plato before him, for Aristotle the metaphor for memory is a wax tablet, since wax can be reused, erased, and kept sufficiently soft for endless impressions to be stamped upon it.³

The influence of Aristotle—and, later, Galen—on the life sciences in the Middle Ages bears a particular significance in the area of memory, as Mary Carruthers describes in *The Book of Memory: A Study of Memory in Medieval Culture*. Here, the medieval *ars memoria* (art of memory) is a training system that refers, “not to how something is communicated, but to what happens since one has received it.”⁴ While our modern models of memory consider mistakes to be a problem of accuracy in recall, in medieval culture mistakes were thought to be the result of improper imprinting, such as trying to be mentally greedy by remembering too much too fast. In other words, memory today is attributed to the clarity of recalling the past, while medieval memory was attributed to the conditions under which memorable material was initially embod-

and research on mild cognitive impairment and Professor Simon J. Williams from the University of Warwick, whose earlier collaborations on rethinking cognitive culture have contributed to this article.

¹ M. Foucault, *Language, Counter-memory, Practice: Selected Essays and Interviews*, ed. D. F. Bouchard (Ithaca, NY: Cornell University Press, 1977), 139.

² R. Sorabji, *Aristotle on Memory*, 2nd ed. (Chicago: University of Chicago Press, 2006), 50.

³ See D. Draaisma, *Metaphors of Memory: A History of Ideas about the Mind*, trans. P. Vincent (Cambridge: Cambridge University Press, 2000).

⁴ M. Carruthers, *The Book of Memory: A Study of Memory in Medieval Culture* (Cambridge: Cambridge University Press, 1990), 13.

ied. Memory was somatic: hence, clergy were advised to subvocalize and murmur and to eat and drink while reading in order to be physically receptive to the text's memory; they were even told to rub certain herbs on their heads to open up their minds. Thus, books, through sight, sound, and color, were constructed to encode the exercises and virtues of memory and animate the murmuring and digesting of thought. The designs of books and whole libraries were aimed at the achievement of artful memory; thus, the *ars memoria* was a technology of embodiment that shaped relationships between things and words, thought and literacy, memory and morality, and microcosmic and cosmic orders. This is why Carruthers concludes that "instead of talking about ethical rules in medieval culture, it would be truer to speak of ethical memories"⁵—memories that also guided one's journey through the wheels of time based on what one had seen, heard, felt, and read. Wheels of time were typical motifs used to symbolize the ages of life in medieval and early modern societies, whereby both the distribution of ages and the human circulation through them represented a cosmic order.⁶ However, my particular interest is how the *ars memoria* and memory itself were materialized not only in things and places but also within the body itself, such as on hands.⁷ The universal articulation of body, mind, memory, and spirit that permeated medieval thought gave way during the early modern and Enlightenment periods to a rationalizing of human capacities according to new laws of nature and productivity. Thus, finding memory in the mind as property and process, rather than around it as ethics and order, became a focus of both philosophical and scientific inquiries, as the next section discusses.

JOHN LOCKE: MEMORY AND PERSONHOOD

In postmedieval society, earlier thought persisted in attempts to map the mind as a reflection of the universe; for example, Robert Fludd's imaginative images from his *Microcosmi Historia* (1619). There are also fascinating examples of early modern models of the brain, such as Descartes's mechanistic neurophysiological model of memory,⁸ Robert Hooke's calculation of memory mechanistically and spatially (1682), and John Willis's brain maps of cranial anatomies and nerves.⁹ However, it was the philosophies of the Enlightenment that reordered the relationship between mind, soul, body, and memory within rational individualism. In particular, John Locke popularized the notion that memory was the guarantor of rational personhood. In his *Essay concerning Human Understanding* (1689), in the sections "[Of] Retention" and "[Of] Identity and Diversity," Locke makes it clear that coherent identity throughout life rests on good memory: where memory is "wanting, all the rest of our faculties are in a great measure useless."¹⁰ In cases of memory "defects," including memory that moves "slowly," the result can be "stupidity."¹¹ Most importantly, Locke's concept of personhood is a continuity of identity unvarying in

⁵ Ibid., 182.

⁶ See T. R. Cole, *The Journey of Life* (Cambridge: Cambridge University Press, 1992); and M. Dove, *The Perfect Age of Man's Life* (Cambridge: Cambridge University Press, 1996).

⁷ C. R. Sherman and P. M. Lukehart, eds., *Writing on Hands: Memory and Knowledge in Early Modern Europe* (Carlisle, PA: Trout Gallery, 2000), distributed by University of Washington Press, Seattle.

⁸ See J. Sutton, *Philosophy and Memory Traces: Descartes to Connectionism* (Cambridge: Cambridge University Press, 1998).

⁹ See S. Finger, "Thomas Willis: The Functional Organization of the Brain," in *Minds behind the Brain: A History of the Pioneers and Their Discoveries* (Oxford: Oxford University Press, 2000), 85–99.

¹⁰ J. Locke, *An Essay Concerning Human Understanding*, ed. A. D. Woolley (New York: Penguin Books, 1974), 125.

¹¹ Ibid., 126.

time, wherein “nothing but consciousness can unite remote existences [*sic*] into the same person.”¹² Being a person means being and remaining identical to oneself; thus, forgetfulness, at any age, interrupts both memory and personhood. As Ian Hacking puts it, for Locke “the person is constituted not by a biography but by a remembered biography.”¹³

For Locke, the person who cannot recollect or remember experiences is therefore not the same person who had the experiences in the first place. In this way, the Lockean diagram of personhood, memory, and consciousness is a philosophical underpinning of modern frameworks of the aging mind, self, and dementia. Prior to the advent of the modern brain sciences, Locke committed Western thought to a universal vision of personhood whose chief attribute was to express human identity as an unforgiving and unforgetting memory. Locke, himself a great collector of books and a compulsive note-taker, also developed a near-digital system of organizing and storing information¹⁴ and exemplified the Enlightenment’s new science of research. From the digestible exercises of the *ars memoria*, memory had become a storehouse for the accumulation of retrievable information. However, it would take modern scientific technologies and new metaphorical styles of thought to carry forward the Enlightenment’s identification of memorable personhood to the brain itself. This was achieved mainly through what became known as the “localization movement” in the nineteenth and early twentieth centuries.

THE NINETEENTH-CENTURY LOCALIZATION OF MEMORY IN THE BRAIN

By the nineteenth century, a cultural and scientific fascination with finding memory in the brain extended the Lockean vulnerabilities of forgetting. Memory, as Draaisma notes, “appeared as a cell on the cranial maps of phrenologists, as a landscape or labyrinth in the work of Romantic writers, as a mineshaft in papers on the unconscious, as the depths of the ocean in poems, as a neurological process in the manuals of brain anatomists, as the photographic plate in a camera in theories on the visual memory.”¹⁵ A good part of this redistribution of memory came about through experimental work on the localization of brain function. Pierre-Paul Broca, Carl Wernicke, Ludwig Lichtheim, Théodul Ribot, and Albert Guillon were scientists who worked not only to locate linguistic and memory problems in the brain but also to distinguish normal from pathological brains based on such localization.¹⁶ Part phrenology, part science, and part science fiction, the popular image of the localized brain drew criticism that such research offered little insight into what constitutes memory itself (or forgetting), as Aristotle had once asked. Another problem at the time was limited clinical technology: the first accurate, chemically colored maps

¹² *Ibid.*, 218.

¹³ I. Hacking, “Memory Sciences, Memory Politics,” in *Tense Past: Cultural Essays in Trauma and Memory*, ed. P. Antze and M. Lambek (London: Routledge, 1996), 81.

¹⁴ R. Yeo, “A Philosopher and His Notebooks: John Locke (1632–1704) on Memory and Information” (lecture, Griffith University, May 20, 2003).

¹⁵ Draaisma, *Metaphors of Memory*, 69.

¹⁶ See R. M. Young, *Mind, Brain, and Adaptation in the Nineteenth Century: Cerebral Localization and Its Biological Context from Gall to Ferrier* (Oxford: Oxford University Press, 1970); I. Rosenfield, *The Invention of Memory: A New View of the Brain* (New York: Basic Books, 1988); S. L. Starr, *Regions of the Mind: Brain Research and the Quest for Scientific Certainty* (Stanford: Stanford University Press, 1989); and T. Kaitaro, “Biological and Epistemological Models of Localization in the Nineteenth Century: From Gall to Charcot,” *Journal of the History of the Neurosciences* 10, no. 3 (2001): 262–76.

of the brain were not produced until the late nineteenth century,¹⁷ along with electrical stimulation. As an interesting nonclinical moment, Hermann Ebbinghaus (1850–1909) developed a means of measuring memory through experimentation (on himself) and published the results in his 1885 book, *Memory*, inaugurating another genealogical thread in the statistical field of quantitative psychological memory research.

Michael Roth claims that in nineteenth-century France, where much of the localization research was carried out, memory disturbances became “a problem not only of recall but of disease, the representation of which contained important lessons about the brain, the self, responsibility, and normality.”¹⁸ As French culture was revising its own relationship to the past, new fields of historical and psychiatric expertise were also determining what was normal to memory. Hence, cases of linguistic disturbances and pathological memory played an expansive role in identifying normal and civilized humanity within those embodied spaces where self, memory, and brain were colocated. As nineteenth- and early twentieth-century researchers amplified the list of memory disorders, they also helped to shape ageist cultural and political discourses.¹⁹ For example, as cultural and national memory became denigrated in America, so did psychologists argue that older people lacked the speed, efficiency, and productive and cognitive capacity to cope with the pace of modern life. The work of American physician George Beard is a good example of this pessimistic perspective. His books *Legal Responsibility in Old Age* (1874) and *American Nervousness* (1881), although poorly substantiated, were influential treatises on the perils of aging decline. In *Legal Responsibility in Old Age*, Beard says that brain disease, failing memory, and moral decay are so intertwined that “decline in memory in old age is only the advance guard of an invading army that sooner or later is to devastate the brain.”²⁰ Beard, who sensationalized memory decline as a risk to the status of civilized personhood itself, died in 1883 at the age of forty-four, one year before he claimed human creativity peaked.

The twentieth century began with the discovery of Alzheimer’s disease (AD), followed by subsequent research on the amyloid plaques and tangled fibrils associated with it, further confirming that normal as well as abnormal aging brains contained dead and dying neurons. With the acceleration of neurological research, especially since the 1960s, it is not surprising that AD has become such a powerful focal point for the articulation of concerns about aging and part of what Gilleard and Higgs call the “black hole” of the fourth age.²¹ Gerontological advocates, such as Robert N. Butler, the first director of the American Institute on Ageing in 1974, urged the replacement of “senility” with the image of AD as deserving of public funding because, unlike “senility,” AD was separable from the aging process itself. Whether the ensuing AD movement has

¹⁷ Draaisma, *Metaphors of Memory*, 186.

¹⁸ M. S. Roth, “Remembering Forgetting: Maladies de la Mémoire in Nineteenth-Century France,” *Representations* 26 (1989): 49.

¹⁹ See C. Haber, *Beyond Sixty-Five: The Dilemma of Old Age in America’s Past* (New York: Cambridge University Press, 1983); P. J. Whitehouse, K. Maurer, and F. Ballenger, eds., *Concepts of Alzheimer Disease: Biological, Clinical, and Cultural Perspectives* (Baltimore, MD: Johns Hopkins University Press, 2000); L. D. Hirshbein, “The Senile Mind: Psychology and Old Age in the 1930s and 1940s,” *Journal of the History of the Behavioural Sciences* 38, no. 1 (2001): 43–56; J. F. Ballenger, *Self, Senility, and Alzheimer’s Disease in Modern America: A History* (Baltimore, MD: Johns Hopkins University Press, 2006).

²⁰ G. M. Beard, *Legal Responsibility in Old Age*, reprinted in G. J. Gruman, ed., *The “Fixed Period” Controversy: Prelude to Ageism* (New York: Arno Press, 1979), 12.

²¹ C. Gilleard and P. Higgs, “Theorizing the Fourth Age: Ageing without Agency,” *Ageing and Mental Health* 14, no. 2 (2010): 121–28.

lessened or heightened the stigma around dementia is debatable,²² but the line was drawn connecting memory loss as a disease of the mind and as pathology of the brain.

The *ars memoria*, the Lockean identification of personhood with continuous memory, and the nineteenth-century sciences of brain localization, however different in time and place, are genealogical moments in the sense that they represent cultural attempts to embody memory and distribute it in ways that invested it with enduring assumptions about the meaning of human aging. On the one hand, although the localization movement's creation of brain maps matching cognitive regions to functions is simplistic compared with modern brain-scanning technology, that work represents the idea that neuroscience can be a discourse of ideas, images, hopes, fears, and explanations of mental worlds. On the other hand, despite the historical distance, our current technologies and those of the nineteenth and early twentieth centuries expose and sharpen the frontier between remembering and forgetting as a place of uncertainty: a moral puzzle, an affront to reason, a medical discovery, a gerontological project, or, later, an enhancement opportunity in our contemporary biosocial order. It is to this frontier that I turn now, as it lies at the heart of contemporary neuroculture and its treatment of and imagination about the aging brain.

AGING, MEMORY, AND THE BIOSOCIAL BRAIN

Georges Canguilhem theorized the story of medicine as the dominance of the normal and the pathological binary,²³ which was predicated on the human body as the natural upon which culture imposes its imperatives. Today, several theorists observe that new genetic, reproductive, neurochemical, and cognitive crises, fostered by pharmaceutical interventions, are rewriting and even reversing the boundaries between the natural and the cultural, and the real and the artificial. Paul Rabinow has referred to this reversal as biosociality, whereby, he says, nature will be “remade through technique and will finally become artificial, just as culture becomes natural.”²⁴ In this sense biology is characterized by its mutability, and as Rothman and Rothman state, “biology has no fixed boundaries, only opportunities.”²⁵ Nikolas Rose and others add that biosocial technologies have become the blueprints of life in general because of their resonance with political and commercial rationalities geared to new regimes of health and lifestyle.²⁶

Neuroscientific advances are transforming the brain into a biosocial laboratory into which human attributes are molecularized and relocalized. These include addictions, desire, creativity, memory, violence, and even love. As Nikolas Rose claims, “when mind seems visible within the brain, the space between person and organ flattens out—mind is what brain does.”²⁷ In America, the National Institutes of Health (NIH) declared the 1990s the “decade of the brain” because of the promise that scientific research held for stemming the tide of brain-related disorders. Indeed,

²² See J. F. Ballenger, “The Biomedical Deconstruction of Senility and the Persistent Stigmatization of Old Age in the United States,” in *Thinking about Dementia: Culture, Loss, and the Anthropology of Senility*, ed. A. Leibing and L. Cohen (New Brunswick, NJ: Rutgers University Press, 2006), 106–20.

²³ See G. Canguilhem, *On the Normal and the Pathological* (Dordrecht: D. Reidel, 1978).

²⁴ P. Rabinow, “Artificiality and Enlightenment: From Sociobiology to Biosociality,” in P. Rabinow, *Essays on the Anthropology of Reason* (Princeton, NJ: Princeton University Press, 1996), 99.

²⁵ S. M. Rothman and D. J. Rothman, *The Pursuit of Perfection: The Promise and Perils of Medical Enhancement* (New York: Vintage Books, 2003), 3.

²⁶ See N. Rose, *The Politics of Life Itself: Biomedicine, Power, and Subjectivity in the Twenty-First Century* (Princeton, NJ: Princeton University Press, 2007). See also S. Franklin and M. Lock, eds., *Remaking Life and Death: Toward an Anthropology of the Biosciences* (Sante Fe, NM: School of American Research Press, 2003).

²⁷ Rose, *The Politics of Life Itself*, 198.

the brain appears to be the “new heart”—viewed as both the locus of emotional behavior and the uncharted continent of human potential.²⁸ By 2009 the NIH was spending nearly 20 percent of its total budget on brain-related projects as a growing constellation of research hybrids such as neuroethics, neurodiversity, and neuroeconomics arose. What it means to be human, to be healthy, and to age successfully seems to have become bound up with the sciences and culture of the brain.

The excitement about the biosocial possibilities of enhancing memory is fueled not only by neuroscientific pronouncements of “unprecedented transformations” of the concept of the human²⁹ but also by a popular and future-oriented neuroculture of ideas and images, hopes and fears, and widespread dissemination of explanations of the brain and mental worlds. These include popular books, articles, and advice literature on the brain, cognition, mood, and emotion,³⁰ media images and celebrity narratives about neuro-related disorders, “nutraceutical” products such as fish oil supplements, “brain training” such as “brain gyms” that teach “neurobics,” and brain-boosting computer games and exercises such as crosswords and sudoku. The brain is thus becoming a “project” in its own right, attended by attempts to stall, protect, or prevent neuro-related cognitive decline and degeneration. While the efficacy of many “brain-training” practices is doubtful—more likely to stave off boredom than to keep the brain sharp³¹—they point to our hopes and anxieties about cognitive fitness, which has joined physical and sexual fitness as another aspect of the idealization of aging today.

Scanning and imaging technologies have also played a significant part in exposing the brain to biosocial experimentation and to public attention. While nineteenth-century scientists based their localization models on static lesions and brain pathologies, scanning technologies in the twentieth and twenty-first centuries make it possible to “light up” the brain in active ways that demonstrate the neuronal elegance of the human mind in real time. In other words, brain-scanning technology renders visible the mind and consciousness as brain functions, making it appear as if normal brains represent normal selves.³² The technology does not necessarily explain the mind and consciousness, but it does correlate them, and in so doing, it merges several scientific fields, including psychology, psychiatry, and pharmacology, into a kind of neuro “metascience.”

Cognitive psychologists and psychogeriatricians have recognized that problems have arisen where the neurosciences have impacted research on the biochemistry or neurobiologization of memory associated with the hippocampus. Some critics have also pointed out that there are different kinds of memory (episodic, semantic working, autobiographical, etc.), each of which has unique characteristics and interdependencies.³³ Others argue that the neuroscientific paradigm neglects the social determinants of recall memory, such as “stereotype threat”³⁴—wherein

²⁸ See, e.g., *TIME* magazine’s *Your Brain: A User’s Guide* (New York: TIME Books, 2009).

²⁹ F. Vidal, “Brainhood, Anthropological Figure of Modernity,” *History of the Human Sciences* 22, no. 1 (2009): 9.

³⁰ See S. Fitzsimmons, *Brain Fitness* (State College, PA: Venture, 2008); and T. Friedman, *The Senior Moments Memory Workout: Improve Your Memory and Brain Fitness before You Forget!* (New York: Sterling Innovation, 2010).

³¹ A. Owen, A. Hampshire, J. A. Grahn, R. Stenton, S. Dajani, A. S. Burns, R. J. Howard, and C. G. Ballard, “Putting Brain Training to the Test,” *Nature* 465 (2010): 775–78.

³² See J. Dumit, *Picturing Personhood: Brain Scans and Biomedical Identity* (Princeton, NJ: Princeton University Press, 2004); and S. Cohn, “Increasing Resolution, Intensifying Ambiguity: An Ethnographic Account of Seeing Life in Brain Scans,” *Economy and Society* 33, no. 1 (2004): 52–76.

³³ E.g., D. Draaisma, *Why Life Speeds Up as You Get Older: How Memory Shapes Our Past* (Cambridge: Cambridge University Press, 2004).

³⁴ E.g., T. M. Hess, C. Auman, S. J. Colcombe, and T. A. Rahlal, “The Impact of Stereotype Threat on Age Differences in Memory Performance,” *Journal of Gerontology: Psychological Sciences* 58B, no. 1 (2003): 3–11.

the social stigma associated with being “old” can affect memory performance—or the benefits of collective contexts in which memories are recalled through shared interactivity.³⁵ In fact, as brain scientist Steven Rose says, “Despite decades of theoretical and experimental work . . . we don’t know how memories are made, how and in what form they are stored in the brain . . . or the processes by which they are retrieved. We are unsure whether memory capacity is finite or bounded, whether we forget, or simply cannot access, old memories.”³⁶

The brain sciences are part of a powerful new cultural diagram of the brain as a biosocial entity, open to neurotechnological experimentation driven by the public interest in neurologically based behavioral and “mood” disorders, a neoliberal biopolitics concerned with individualizing and biologizing health problems, and military and criminological agendas for risk management and social control. As Rose’s statement suggests, however, this diagram of the biosocial brain may add little to our understanding of memory and aging. Nevertheless, in its reduction of memory (and mind) to brain function, it creates the hope (and the hype) of remedial treatment for a range of memory problems, including those precipitated by the aging process. An example of a new memory problem created in the wake of our concern about brain aging is “mild cognitive impairment,” which I look at next in relation to the cultural question of forgetting.

MEMORY LOSS AND COGNITIVE HEALTH

Outside the laboratory and clinic, memory and “cognitive health” have become essential components of optimal aging. Memory loss not only indicates a possible slide from the third to the fourth age, but maintenance of recall memory is key to successful, active, and basically ageless identities in our so-called information society. Forgetting is not just a neuroscientific problem but a neurocultural one as well. Were it not for what Steven Post calls our “hypercognitive society,” “would we fear dementia enough to label it AD [Alzheimer’s disease] at a certain threshold?”³⁷ Thus, behind the dialogue between neuroscientific memory research and its critics lie greater social expectations for cognitive performance, if not the boosting/banking of cognitive or mental “capital”³⁸ and advanced treatments for cognitive decline. In a society in which more women than men are diagnosed with AD, in which more women than men are treated for mild cognitive impairment (MCI), and in which women are living longer than men, the gender implications for hypercognitive standards also complicate how the biosocial structuring of bodily life is impacting gender relations.

Hypercognitive expectations have also led to confusion about acceptable, or “normal,” levels of “forgetfulness” and memory “deficits,” as in debates about cognitive enhancement and MCI in older adults—the latter being a feared cross-boundary category of predementia memory loss and cognitive decline that has, in effect, become a convergence point for the neurocultural,

³⁵ See R. Bassett and J. E. Graham, “Memorabilities: Enduring Relationships, Memories and Abilities in Dementia,” *Ageing and Society* 27, no. 4 (2007): 533–54.

³⁶ S. Rose, *The Future of the Brain: The Promise and Perils of Tomorrow’s Neuroscience* (New York: Oxford University Press, 2005), 212.

³⁷ S. G. Post, “The Concept of Alzheimer Disease in a Hypercognitive Society,” in *Concepts of Alzheimer Disease: Biological, Clinical, and Cultural Perspectives*, ed. P. J. Whitehouse, K. Maurer, and J. F. Ballenger (Baltimore, MD: Johns Hopkins University Press, 2000), 249.

³⁸ See Foresight Mental Capital and Wellbeing Project, *Final Project Report—Executive Summary* (London: Government Office for Science, 2008).

pharmaceutical, and gerontological communities.³⁹ Given that individuals with MCI have a greater-than-normal risk of progressing to dementia, there is much interest in treating them as early as possible. Figures vary as to the percentage of individuals diagnosed with MCI who go on to develop dementia, with some studies indicating lower,⁴⁰ and some higher,⁴¹ numbers. The diagnostic criteria for different subtypes of MCI also vary.⁴² Various terms have been proposed to describe MCI in older adults. Various drugs and supplements for MCI have been subjected to clinical trials over the past decade, including medicines already licensed for the treatment of AD, new chemical entities thought to modulate memory function such as ampakines,⁴³ putative drugs based on natural products, and dietary supplements such as high doses of vitamin B.

What is especially interesting about MCI is that, before it became a mainstream diagnostic category, the typical definition of impairment on cognitive tests was performance that was two standard deviations (SDs) below normal. Now the dominant view stipulates that there must be objective memory impairment corresponding to 1.5 SDs below normal,⁴⁴ based on 1.5 SDs becoming an earlier point of intervention in the disease process. In other words, rather than waiting until a person's memory deficit reaches a clinical threshold of 2 SDs, clinicians now believe it is better to catch the deterioration earlier—hence, the definition of pathological memory has moved one step closer to normalcy. Clinical trials may soon be performed with increasingly healthy people who may exhibit no cognitive symptoms of impairment.

The MCI field is thus more than a cognitive science, for its diagnostic and operational language situates it across a number of discourses around intervention, aging, mental health, and cultural anxiety about the meaning of memory loss. Even the debate about the efficacy or effec-

³⁹ See D. A. Bennett, J. A. Schneider, J. L. Bienias, D. A. Evans, and R. S. Wilson, "Mild Cognitive Impairment Is Related to Alzheimer Disease Pathology and Cerebral Infarctions," *Neurology* 64, no. 5 (2005): 834–41; G. Frisoni, E. Canu, C. Geroldi, O. Zanetti, and V. Zacchi, "Drug Prescription in Mild Cognitive Impairment: The Physicians' Perspective in Italy," *International Journal of Geriatric Psychiatry* 21, no. 11 (2006): 1071–77; S. Katz and K. R. Peters, "Enhancing the Mind? Memory Medicine, Dementia, and the Ageing Brain," *Journal of Ageing Studies* 22, no. 4 (2008): 348–55; A. Leibling, "From the Periphery to the Center: Treating Behavioural and Psychological Symptoms in Dementia," in *Do We Have a Pill for That? Interdisciplinary Perspectives on the Development, Use and Evaluation of Drugs in the Treatment of Dementia*, ed. J. P. Ballenger, P. Whitehouse, C. Lyketsos, P. Rabins, and J. Karlawish (Baltimore, MD: Johns Hopkins University Press, 2009), 74–97; T. Moreira, C. May, and J. Bond, "Regulatory Objectivity in Action: Mild Cognitive Impairment and the Collective Production of Uncertainty," *Social Studies of Science* 39, no. 5 (2009): 665–90; R. C. Petersen, J. C. Stevens, M. Ganguli, E. G. Tangalos, J. L. Cummings, and S. T. DeKosky, "Practice Parameter: Early Detection of Dementia; Mild Cognitive Impairment (an Evidence-Based Review)," *Neurology* 56, no. 9 (2001): 1132–42; R. C. Petersen, G. E. Smith, S. C. Waring, R. J. Ivnik, E. G. Tangalos, and E. Kokmen, "Mild Cognitive Impairment: Clinical Characterization and Outcome," *Archives of Neurology* 56, no. 3 (1999): 303–8; P. J. Whitehouse and H. R. Moody, "Mild Cognitive Impairment: A 'Hardening of the Categories'?", *Dementia: The International Journal of Social Research and Practice* 5, no. 1 (2006): 11–25; P. J. Whitehouse and E. T. Juengst, "Anti-aging Medicine and Mild Cognitive Impairment: Practice and Policy Issues for Geriatrics," *Journal of the American Geriatrics Society* 53, no. 8 (2005): 1417–22.

⁴⁰ See M. Bruscoli and S. Lovestone, "Is MCI Really Just Early Dementia? A Systematic Review of Conversion Studies," *International Psychogeriatrics* 16, no. 2 (2004): 129–40.

⁴¹ See Bennett et al., "Mild Cognitive Impairment," 834–41.

⁴² See H. Tuokko, R. J. Frerichs, and B. Kristjansson, "Cognitive Impairment, No Dementia: Concepts and Issues," *International Psychogeriatrics* 13, no. 1 (2001): 183–202. However, the criteria originally outlined by Ronald Petersen and colleagues have been the most influential to date: memory complaint; normal activities of daily living; normal general cognitive functioning; abnormal memory for age; and not being demented. See Petersen et al., "Mild Cognitive Impairment," 304.

⁴³ G. Lynch and C. M. Gall, "Ampakines and the Threefold Path to Cognitive Enhancement," *Trends in the Neurosciences* 29, no. 10 (2006): 554–62.

⁴⁴ See Petersen et al., "Mild Cognitive Impairment."

tiveness of intervening drugs may not be the point here, because neuroscientific and pharmacological interests are already claiming MCI as the next locus of enhancing the mind and optimizing aging. To conclude, I wish to return to history, in particular to Nietzsche's critique of memory and forgetting because it inspires us to think about what forgetting means to memory. By no means am I suggesting that memory loss in old age is without difficulty or that dementia should be recast as simply a constructed deviancy of hypercognitive culture. However, good memory is not only about healthy cognitive capacity but also about how forgetting is crucial to both the sciences and the arts of life in the aging process.

CONCLUSIONS: ON FORGETTING AND REMEMBERING DIFFERENTLY

In his essay "On the Uses and Disadvantages of History for Life," Friedrich Nietzsche criticizes modernity for its enslavement of memory to the service of new imperial narratives about history, nationhood, war, and culture. He extols the virtues of forgetting thus:

He who cannot sink down on the threshold of the moment and forget all the past, who cannot stand balanced like a goddess of victory without growing dizzy and afraid, will never know what happiness is—worse, he will never do anything to make others happy. . . . Forgetting is essential to action of any kind, just as not only light but darkness too is essential for the life of everything organic.⁴⁵

Arguing that a person's moral health depends on a balance between remembering and forgetting, Nietzsche questions how memory itself has become identified as a universally reliable access point to the bare truths of social existence. The role of forgetting should be valued, he avers, as a liberating antidote to modern scientific narratives that equate successful personhood with continuous openness to relentless horizons of experience, where everything is seen, known, and remembered, where everything, like today's brain, is alight.

Nietzsche's critical philosophy inspired Michel Foucault to think about memory, self, and society. In particular, Foucault writes about "counter-memory," or remembering differently, as a radical intellectual practice through which one can exercise critical curiosity about dominant logics of continuity in memory, history, and personhood.⁴⁶ The critical line of thought that runs from Nietzsche to Foucault suggests four crucial points about memory.

First, memory is historically contingent because it is contextualized, experienced, narrated, symbolized, and embodied within specific social priorities and fields of knowledge. These priorities and fields fold memory into personhood in specific ways. In modern society, this folding takes the form of a naturalized, timeless, and continual guarantor of rational personhood—a framework initially posited by John Locke.

Second, the Nietzschean critique questions how we constitute relationships between past, present, and future in ways that create the kinds of aging selves, minds, and forms of consciousness by which we judge our lives to be memorable. In this sense, forgetting is not necessarily memory loss or inaccurate recall, because forgetting can provide a means to explore the biographical folding of our lives outside their conformance to memory. Forgetting allows us to age; thus, our aging and our pasts are molded as much through the work of forgetting as they are through the tracing of memory. There are curious stories about people who remember too

⁴⁵ Friedrich Nietzsche, "On the Uses and Disadvantages of History for Life," in *Untimely Meditations*, trans. R. J. Hollingdale (1874; Cambridge: Cambridge University Press, 1983), 62.

⁴⁶ See Foucault, *Language, Counter-memory, Practice*.

much, such as Jorge Luis Borges's "Funes, the Memorious," a tale about a boy who could remember everything in detail after suffering an accident. The boy's words serve as a warning to Borges when he says: "My memory, sir, is like a garbage disposal."⁴⁷ A more recent and poignant example is Jill Price's ironic memoir, *The Woman Who Can't Forget*, wherein Price (born in 1965) tells of the inescapable pain and burden that came with her remembering everything on a daily level since 1980 (and most things since 1974).⁴⁸

Third, the critique brings to light modernity's obsession with permanent and unwavering memory to the point that the radical value of other scattered memorial styles or counter-memories is neglected. Yet these are precisely the critical resources that aid the deconstruction of our dominant cultural narratives about aging and antiaging and the pathologies of forgetting. Even so-called neural plasticity is a lifelong attribute that is conditioned within specific material contexts that depend on the right to forget as well as the obligation to remember. In other words, one of the benefits of human brain plasticity is that it allows us to filter, change, interpret, negotiate, and even forget our memories in order to create coherence and stability in our lives, despite social pressures to optimize memory.

Fourth and last is the ethical commitment to stop thinking in terms of forgetful aging brains or memory deficits alone when it comes to older persons who may be experiencing these. "We owe it to those who have aging brains," says Peter Whitehouse, "not to reduce their humanity to one organ."⁴⁹ And as Canada faces a doubling of AD diagnoses in the next twenty-five years, hopefully this ethical commitment will become our next genealogical moment in the story of the aging mind. A

⁴⁷ J. L. Borges, "Funes, the Memorious" (1942), 4, <http://evans-experientialism.freewebspace.com/borges.htm> (accessed January 13, 2008).

⁴⁸ Jill Price, with Bart Davis, *The Woman Who Can't Forget* (New York: Free Press, 2008).

⁴⁹ P. J. Whitehouse and D. George, *The Myth of Alzheimer's* (New York: St. Martin's Press, 2008), 17.

Genealogy and Guidelines for a Radically Embodied Approach to Mind and Consciousness. Mauro Ceruti¹ and Luisa Damiano^{2*}.
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McCulloch and Pitts, by drawing artificial networks of neurons, demonstrated that the brain can be conceived of as a machine of this kind
“ a Turing machine. Indeed, according to the 1943 McCulloch-Pitts modeling, neurons are functional units analogous to Boolean logic
operators (AND, OR, etc.), and compute their states by applying the rules of Boolean logic to their input signals. When these
“compute-and-fire” units are interconnected in networks, they are able to implement complex Boolean functions. Embodied
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