

THE FORTNIGHTLY CLUB

Of

REDLANDS, CALIFORNIA**Founded 24 January 1895****Meeting #1950, February 20, 2020 (02/20/2020)****Bill McDonald****“ON MEMORY”**

“Great is the power of memory, exceedingly great. O my God, a spreading limitless room within me.... I cannot grasp all that I am; the mind is not large enough to contain itself...”

St. Augustine, *Confessions*, Book X.

Choosing a topic for a Fortnightly paper gradually becomes more and more difficult. The stretch of time between papers—more than two years—lends a certain *gravitas* to the choice, as does the dwindling number of opportunities left for those of us past eighty. Some of us settle into grooves, for example giving multiple papers on local topics certain to interest; or on hard-earned expertises, as I have with four papers on ancient Greece. I started out this time to write a fifth one—on the Amazons, no less—yet another attempt to insert the feminine and foreign into our bastion of white maleness. But after reading quite a bit and drafting a few pages, my interest flagged; it seemed safe, even self-indulgent, to revisit yet another ancient topic.

Any given year’s papers are typically scattered across many fields, and connections between them are at best by chance. But there are patterns, and among the most common is a thread, sometimes an entire tapestry, of

autobiography that runs through many of the papers I've heard from the time I joined twenty years ago. The topic might be arcane or abstract, but there's hardly been an essay in which the personal experience of the presenter doesn't appear in some important guise. Recently, Jim Appleton brought this pattern into the foreground, urging members to follow his example and write down their life-stories, and not only as a legacy for their descendants. Bill Cunningham did so, as have several others; indeed I think *every* paper presented to date this season has done so in some way. We've been both edified and entertained. Given that, I asked myself what topic might actually be both interesting *and* useful to the assembled, and a personal, "un-safe" challenge as well.

So, hoping to be just that— "interesting *and* useful," both in step with this pattern and also supporting the memoir-writers among us, I've opted to tackle a formidable, inexhaustible subject: human memory itself. My approach will make some amateurish use of the most recent science on the subject, and there'll be a couple of philosophical sidebars on the brain and consciousness, but in the main this will be a reflective, meditative personal essay, not a rigorous, proof-based monograph: Montaigne, not *The NIH Brain Initiative*, is my model. I'll take comfort from my mentor's 1571 essay "On Liars" (I, 9): "There is not a man living whom it would so little become to boast of his memory as myself, for I have scarcely any at all, and do not think that the world has another so marvelously treacherous as mine. My other faculties are all sufficiently ordinary and average; but in this I think myself very rare and singular, and deserving to be thought famous."

And I'll begin, as he did, at the bottom, with the bad—worst?—news, and try to climb my way out of a self-dug well.

PART I: Downward to Darkness

My first hunch is that the majority, if not all, of us in the room begin in a similar place whenever we pause to reflect on memory: fear of its loss. Most of us have friends or relatives who have succumbed to Alzheimer's or one of its dementia avatars. I lost my father to it, and so am constantly alert to the possibility—the likelihood?— of one final, dark inheritance from him. My next hunch is that most of us here have read about—and remember—the competing base narratives of how Alzheimer's unfolds: the first emphasizes the accumulation of a specific protein, amyloid-beta, in the brain as the primary cause; a more recent theory proposes that metabolic dysfunction, specifically of mitochondria, a cell's energy-producing machinery, as the root cause. But most researchers don't settle for a single account: they tell us that the disease arises from a combination of genetics, natural ageing, environmental factors and "lifestyle," and given those four broad haymakers it's hard for us not to over-interpret a forgotten appointment, or to over-dramatize an inability to instantly retrieve long-familiar names. It's an anxiety, sometimes approaching paranoia, that haunts us as our past experience seems to slip away, and stories about a "normal" rather than a precipitous decline in recall powers does little to smooth our thinning feathers.

If there's a competing anxiety that comes with memory it's quite the opposite: not loss but recall, *involuntary* recall. Certain memories return unbidden: serious trauma, most obviously (and that needs no elaboration). But our memories also preserve, in an out-of-the-way graveyard, revenants of unforgotten wrongs, those we have committed, *and* those we have suffered: the chaos of revenge, the endless struggle with remorse. Both can spawn haunting regrets, dark relics that we want to erase from memory's archive but that return to us nonetheless. We may still want to revenge, even though we know it would be fruitless; other memories we pray will stay buried, protected and hidden from the future. And, in a still darker corner, a Potter's Field of silenced past events can suddenly rise and interrupt our sense of self-mastery. When *those* secrets rise to the surface we can feel a bloom of fear in the chest, like a drop of ink spreading in water, that they will become known. I don't think there's any other aspect of our mental lives, including nightmares, that causes such anxiety as these two: memory's loss *and* its unbidden return. As an ironic capstone to this point, we're masters of remembering wrongs, and terrible at remembering moments of unself-conscious happiness.

This leads directly to my fundamental claim: everything's at stake with remembering because without our memory we don't have our selves. *We are* what we have learned from the day of our birth and what we have remembered since. Memory is not a storehouse of information but a "continual activity of the mind" which enables selfhood. Philosopher John Searle offers this: "A sense of self is essential to memory because all memories are precisely mine. What makes them

memories is that they are part of the structure that shapes my sense of self. Memory and the self are all tied up together and are especially linked to my body image.” This includes explicit memory, of course, but also implicit memory — motor skills, habits, and other unconscious behaviors—a subject that I’ll just touch on in what follows, but equally necessary to our selfhood and function in the world. Analysts of memory across the spectrum, from hard-ass Artificial Intelligence (AI) scientists to the fuzziest New Age therapist, *all* agree on one thing: that memory is central to our identity. So there’s a lot—everything, in fact—at stake.

The ancient Greeks—sorry, can’t help myself— knew this and celebrated its truth in their worship of the Titan Mnemosyne. According to Hesiod she’s the daughter of Uranus (heaven) and Gaia (earth), and the mother of the nine Muses. We hear her in our word “amnesia,” literally “away from memory,” that very un-English “mn” preserving the Titan’s name. Dramatizing her importance, there was a statue of Mnemosyne in the shrine of Dionysus at Athens, alongside the statues of the Muses, Zeus and Apollo. Dionysian tragic poets praised her (and her muse-daughter Melpomene), and epic poets always called on her daughter Calliope before beginning their performances: both knew that their arts preserved, sustained human story long after individual memories were lost. Orphic cult-priests appealed to her when leading an initiate into rebirth. And Hesiod added something quite significant: what Memory enables in bardic song helps us to *forget* the pain of our present moment and age. In a similar vein, a line from Book X of [Plato’s Republic](#) speculates that the souls of the dead must drink from the

“river of Unmindfulness” before rebirth, and the Orphic priests took their cue from it.¹ First you must drink from Lethe, because only then can you lose your old self completely; after purification you then drink from the pool of memory and begin your new life. Memory and Forgetfulness: wisely twinned by these early writers, as we shall see.

So, it’s not surprising that memory’s uncertainties can discourage, even overwhelm, and perhaps a short catalog can give us a measure of control, maybe even a laugh. For example, think about those disagreements, especially those spousal disagreements, over What Really Happened and what we’ve severally invented: funny, but with an underbelly of irritation and defensiveness. How many of you have “lost” one—more than one— memory debate with your Significant Other? One of my favorite New Yorker cartoons shows a middle-aged couple, the wife standing in profile, obviously speaking and just as obviously pleased with herself, while the husband in the foreground faces us, his hair

¹ Pausanias, that very boring but invaluable Greek traveler of the second century CE, witnessed such a ceremony: “[The supplicant] is taken by the priests, not at once to the oracle, but to fountains of water very near to each other. Here he must drink water called the water of Lethe (Forgetfulness), that he may forget all that he has been thinking of hitherto, and afterwards he drinks of another water, the water of Mnemosyne (Memory), which causes him to remember what he sees after his descent ... After his ascent from [the oracle of Trophonios the inquirer is again taken in hand by the priests, who set him upon a chair called the chair of Mnemosyne (Memory), which stands not far from the shrine, and they ask of him, when seated there, all he has seen or learned. After gaining this information they then entrust him to his relatives. These lift him, paralysed with terror and unconscious both of himself and of his surroundings, and carry him to the building where he lodged before with Tykhe (Fortune) and the Daimon Agathon (Good Spirit). Afterwards, however, he will recover all his faculties, and the power to laugh will return to him.” *Descriptions of Greece*, 9: 39.3.

standing on end and his face twisted into a comic grimace as his vaunted memory's been disproved yet again.

Others aren't so funny: All of us know its maddening vagaries: elusive "tip of the tongue" words whose absence mars a joke, or a portrait, or a satisfying recovery of the past. Say we're well launched into an important, brilliantly informative account of memory's biology... well, you know, that funny-looking part of the brain where memory's centered, but can't quite come up with the damn thing: "rhino-campus," is it, or "hippo-drome"? A glazed stare into the middle distance doesn't help, and you're haunted by what was so clearly present just a moment ago while your once-remarkable tale flops around like a streamlined fish suddenly out of water.

Then there's people's names, names, names: names just out of reach, for example, which leave us floundering in an open space we didn't know existed when we were young, or which suddenly turn an introduction of an old friend or colleague into a quagmire. There's scrambled sequences and geographies—what happened when and where—that we chronically conflate. It's deflating that we've "forgotten so much" that we once treasured, and if you're addicted to comic irony as I am it can be very hard to maintain its cheerful view of things when treasured memories suddenly slip away. Memory can be paradoxical, what Janet Malcolm terms "a thoughtless tyrant, recalling fragments of the past unasked for yet failing to bring back those things we want to remember, even though it is memory itself which torments us w/the knowledge that we want to recall them" (Malcolm, 2010). One frustrated wag, a Harvard psychologist, set out *The Seven Sins of Memory*:

The first three of *omission*—

Transience: as in “I knew that perfectly well that yesterday, but today...”

Absentmindedness: as in “I know I came into the kitchen to get something...” It can be disastrous: a preoccupied Yo-Yo Ma once left his \$2.5 million cello in a New York City cab.

Blocking: as in “I meant to say “public” but “pubic” came out...”

And the final four of *commission*:

Misattribution: as in “I’ve told that story many times, so it must be right, even if everyone else remembers it differently.” Or an intentional version: “I did not have sex with that woman!”

Suggestibility: as in “She looks like my high school sweetheart, so she must be...”

Bias: as in “No, my litigious ex-business partner really did say all those things...”

Persistence: as in “I want to forget my sodden, boorish behavior at the Campbell’s New Year’s party, but the images keep popping up.” More darkly, this last one is the region of traumatic memory, unwanted images that return to haunt battle-scarred soldiers and victims of violent crime.

But those are the simple, ready-to-hand examples. There’s a second stage of transience and misattribution when we recognize that our memories of a specific

event alter, sometimes dramatically, over time. Defense attorneys constantly instruct the court that witness memories are unreliable, and easily merge with line-up photos, what's called "filling in the gaps." I love the tart Russian aphorism: "He lies like an eyewitness." Memory's not like books on a library shelf, preserving content in the minutest detail. It's shadowy, disjointed, impressionistic. Another layer: William James claimed what later scientists have confirmed, that many of the memories we experience are in fact memories of memories.² We recall what we've already recalled, and there's no solid "floor" of clear certainty about the past that we can recover. John Searle continues James' thought and affirms its importance: "When I form an image of some event in my childhood, I don't go to an archive and find a pre-existent image, I have to consciously form an image" (1999). So to remember is at least in part to imagine and construct, and the act of transposing a memory into written words may further transform it, *and* also release new glimpses into the past.

Then there's questions of selection and value: Once I, or any of us, become attentive, the images and story-flashes from our early life multiply quickly. We search for one tale and a dozen often appear, making selection a necessity. But on what grounds do we select what's important, most meaningful? Do the grounds shift depending on circumstances?

² *Psychology: A Briefer Course*, Chapter 18.

- **Vividness?** (Recall a Moment of Great Fear from your childhood).
This often involves Images, not scenes or events, and memory almost always favors image over words.
- **Frequency of recollection?** (Freud said that repetition signified a great deal about our hidden character: but does it?)
- **Emotional resonance?** (Remember the death of a parent)
- **Beginning points and apparent consequences?** (Recall how you've built a sequence of stories from a single event that seemed decisive then—but does it still?)
- **Representative status?** (think of memories that have seems to encapsulate, stand for, eras of your life: high school, for example, and how you may tell those stories to people who lived them with you, or who are of the same age and class.)
- **Reconstructed predictive value?** (Edgar Allen Poe is great on memories in this category: “Little did I realize that...)

Moving on from “selection,” there’s a whole array of what I’ll call “external forces” that play roles in what we recall and how we recall it.

- **Culturally endorsed importance:** Recall your first passionate political argument as an adolescent or young adult—Kennedy/Nixon, Johnson and Viet Nam, Carter and Iran— personal, yes, but dependent on the events and climate of the time. Social psychologists generalize from experiences like these, viewing consciousness as in part a product of cultural influences. For instance, because different

cultures speak different languages, they also codify reality differently.³ That difference in codification leads to differences in the experience of reality, and therefore of consciousness.⁴

- **Narrative form:** do the structures in which you cast, consolidate, connect your memories have sources in the storytelling patterns, especially cinematic ones, of your era? If you're under fifty, the cinematic may even dominate; if you're above, then the forms of text—fiction, history, biography— may dominate. I often tell college students that one royal road to self-knowledge is an awareness of the ways in which you characteristically narrate your experience, especially to yourself. Knowing the forms and genres most “natural,” congenial, to you enables you to see how they quietly shape your understanding.

Here's another ready example of “externality” that we all share: From earliest childhood our parents' home movies and photographs so interfuse with our allegedly “unique memories” that standards of strict separation and surety about “what really happened” simply melt away. (Richard Avedon: “Photographs are accurate. None are the truth.”) On top of *those* images there's the cache of family tales we've all inherited: your granddad loved telling everyone about the time you

³ The *Los Angeles Times* ran a fine article on this by Amina Khan in the California section of the 12/21/19 edition.

⁴ Language is the main mechanism for transmitting a mode of consciousness, and an analysis of language can to some extent reveal the mentality of people who speak that language. <https://courses.lumenlearning.com/boundless-psychology/chapter/introduction-to-consciousness/>

tried to eat a snail or took off your clothes in Sunday School or made some clever, precocious comment that the gathered adults laughed at and admired—all these enter your memory bank, even if you don't remember specifics at all — and even if you dispute grandpa's recollection, that dispute contributes to how you remember what may or may not have happened.

Another arena: If you're sharing your memory, or insisting on its accuracy, then the *audience*—the person or persons you're conversing, or contending, with can shape the memory and your investment in it. I bet some of you had conversations about this at one of your holiday family feasts last year.

And the problem's multiplied if you've undertaken a memoir yourself: how complete and how accurate your memories will be also depend on its audience. To claim you write "just for yourself" is self-deceiving: but if you write just *for* your family, then....; if you write *for* your family and friends, then....; if you write *for* a general public, then....; if you write to represent and make proclamations about your era, then... (Virginia Woolf: "The reader becomes the instigator and inspirer of what is written").

Clearly, recollection isn't a matter of establishing a "pure relationship" with a single past. Even if we had complete videos of our history they too would require interpretation: awareness of the camera's point of view, microphone placement, our half-conscious framing of what makes a meaningful picture and so on. Returning to our scene in which each of our family members has a different, some time wildly different, version of an important event, that "corrected" version now exists alongside our original memory, and the older story and images persist

along with the new, the distinctions blurring some over time. Filing memories under the True/False binary may be too simple: Layering, interference, desire, social situations, all have to figure in.⁵

There's yet another, creative layer: memory's about the present as well as the past. It's more than an archive; it reveals almost as much about our current preoccupations and beliefs as it does about what went before. It draws a significant part of its meaning from the context, what my friend Dwight Yates calls "memory's neighborhoods." Here's an experiment I used to use when I taught a course at the UofR called "The Reading and Writing of Autobiography":

⁵ Thus Edelson et al. (2011) examined how socially induced memory errors are generated in the brain. Abstract: "Human memory is strikingly susceptible to social influences, yet we know little about the underlying mechanisms. We examined how socially induced memory errors are generated in the brain by studying the memory of individuals exposed to recollections of others. Participants exhibited a strong tendency to conform to erroneous recollections of the group, producing both long-lasting and temporary errors, even when their initial memory was strong and accurate. Functional brain imaging revealed that social influence modified the neuronal representation of memory. Specifically, a particular brain signature of enhanced amygdala activity and enhanced amygdala-hippocampus connectivity predicted long-lasting but not temporary memory alterations. Our findings reveal how social manipulation can alter memory and extend the known functions of the amygdala to encompass socially mediated memory distortions."

Groups of five participants each watched a narrative movie and were tested a few days later. The participants remembered most of the information with high accuracy and confidence. Each of the participants was then presented inside the fMRI scanner with fake replies of the other four participants in the group, which negated the original correct high-confidence response to the same questions. A substantial part of the original correct responses were changed (in line with earlier behavioral results on the power of social conformity such as those by Sherif [1936]). The long-lasting, but not the temporary, false memory was predicted by enhanced amygdala activity and hippocampal-amygdala functional connectivity during the exposure to the social influence. Posttest debriefing indicated that most participants were unaware of the manipulation, let alone of the extent of their long-lasting memory change. In other words, this largely unconscious hippocampal-amygdala crosstalk was required to bring about the implicit change in explicit memory.

- Recall an event from your childhood in which you did something you now (seriously?) regret.
- Did you go to an archive and find a pre-existent set of images? Was it waiting there ready to be called up? Or did you have to consciously form those images?
- Now narrate (imagine narrating) that event and its images to your best friend... and then to this audience... and then to the police. Would you select from a data base, does the memory stay the same, or does the emphasis change with the audience?

All this to say that perfect recall's the chimera, assembled images and interweaving of past and present the reality. I'm claiming that the common source for our pessimism lies in overestimating memory, expecting infallibility when fuzzy edges and uncertain centers are the rule.

There's another *indirect* source of our memory-anxiety: the prodigies of memory. We're familiar with ancient rhapsodes in pre-literate cultures who could recite enormous epic poems, innovating like jazz musicians as they went, but modern examples pop up on regularly on newsfeeds and in documentaries: chess master Timur Gareyev who played 48 simultaneous games blindfolded, winning 35, or Joshua Foer's account, in *Moonwalking with Einstein*, of a "mental athlete" who memorized and recited in perfect order the fifty-two cards in a shuffled deck after just fifteen seconds of study.⁶ So there's hope for us! We *can* improve our

⁶ Here's Oliver Sachs (*An Anthropologist from Mars*) on memory capacity: "One may be born with the potential for a prodigious memory, but one is not born with a disposition to recollect; this comes only with changes and separations in life — separations from

memories, and the curve seems to be almost without limit. Since memory, learning and selfhood are so intertwined, it's not surprising that hundreds and hundreds of self-help books have been written to aid us. Americans love these optimistic, bootstrap narratives of self-improvement: *Memory Unlimited; Quantum Power Memo; How to Develop a Perfect Memory; Super Memory, Super Student; Learn Like Einstein* (who actually was absent-minded-professor-level forgetful about many things in his life). These books seem to see readers as fanatic capitalists, hoarding up our pasts in our Memory Banks, never losing any of its treasures; we'll always be rich.

Most of us have experimented with memorizing acronyms⁷ or building our own memory palaces, for example linking twenty items in a presentation we're preparing to twenty specific locales in our living room or study.⁸ It works, at least

people, from places, from events and situations, especially if they have been of great significance, have been deeply hated or loved . . . Discontinuity and nostalgia are most profound if, in growing up, we leave or lose the place we were born and spent our childhood, if we become expatriates or exiles, if the place, or the life, we were brought up in is changed beyond recognition or destroyed."

⁷ For example, there's the English schoolboy memory trick for the royal houses: "So, no plan like yours to study history wisely." (Saxon, Norman, Plantagenet, Lancaster, York, Tudor, Stuart, Hanover, Windsor)

⁸ As far as I know, Cicero is the first Western writer to describe memory palaces. He does so in a famous anecdote: The Greek lyric poet Simonides of Ceos "was dining at the house of a wealthy nobleman named Scopas, and chanted a lyric poem which he had composed in honor of his host, in which he followed the custom of the poets by including for decorative purposes a long passage referring to Castor and Pollux; whereupon Scopas with excessive meanness told him he would pay him half the fee agreed on for the poem. The story runs that a little later a message was brought to Simonides to go outside, as two young men were standing at the door who earnestly requested him to come out; so he rose from his seat and went out, and could not see anybody." They were Castor and Pollux, who took revenge by destroying the hall in which the host had insulted them, "crushing Scopas himself and his relations underneath the ruins and killing them; and when their friends wanted to bury them but were altogether unable to know them apart as they had been completely crushed, the story goes that Simonides was enabled by his recollection of the place in which each of them had been reclining at table to identify them

temporarily. We marvel at the prodigies and even at our own occasional successes, but still suspect those inflated titles: “Unlimited Memory”; “Perfect Memory” Maybe not....

for separate interment; and that this circumstance suggested to him the discovery of the truth that the best aid to dearness of memory consists in orderly arrangement. He inferred that persons desiring to train this faculty must select localities and form mental images of the facts they wish to remember and store those images in the localities.” *De Oratore* 86: 351-54. Marcel Detienne argues that Simonides “secularized” memory by making its practice a technique, and demonizing forgetting as failure rather than the two working together in the creative imagination.

PART II: The Brain and Memory

Much of what I've said is Old News to cognitive scientists and psychologists, and they've long since quit lamenting the "loss" of verifiable certainty, a loss of something that never existed. Still, for us laymen, another potentially discouraging part of our conjuring of memory is the possible reduction of it to mechanical processes in the brain: are we just our synapses, bundles of molecules, and not much else? And do we waste what we have? — A Salk Institute 2016 study, reported in *Scientific American*, claims that the brain's capacity is ten times larger than previous thought: expressed metaphorically in bytes, it approaches a quadrillion (Interlandi, 2016).⁹ UCLA's Dr. Kelsey Martin puts it this way: "Each of us has about 85-billion neurons, and each of those is connected through more than a thousand synapses to other neurons. This circuit

⁹ In the course of reconstructing a rat hippocampus, an area of the mammalian brain involved in memory storage, they noticed some neurons would form two connections with each other: the axon (or sending cable) of one neuron would connect with two dendritic spines (or receiving antennas) on the same neighboring neuron, suggesting that duplicate messages were being passed from sender to receiver. Because both dendrites were receiving identical information, the researchers suspected they would be similar in size and strength. But they also realized that if there were significant differences between the two, it could point to a whole new layer of complexity. If the spines were of a different shape or size, they reasoned, the message they passed along would also be slightly different, even if that message was coming from the same axon.... So they decided to measure the synapse pairs. And sure enough, they found an 8 percent size difference between dendritic spines connected to the same axon of a signaling neuron. That difference might seem small, but when they plugged the value into their algorithms, they calculated a total of 26 unique synapse sizes. A greater number of synapse sizes means more capacity for storing information, which in this case translated into a 10-fold greater storage capacity in the hippocampus as a whole than the previous three-size model had indicated.

of 100-trillion connections forms the foundation of our ability to perceive, feel, imagine — and remember.”¹⁰

The basics of memory’s brain biology are well-established.¹¹ As noted already, we have two major types of memory: explicit or declarative memory for facts, places, objects, events; and implicit or non-declarative memory for perceptual and motor skills (riding a bike, driving a car): both are necessary for our sense of self. Declarative memory is episodic: it stores the what/where/when of its objects, for example the specifics about your best friend or your all-time favorite movie. It also includes semantic memory, which doesn’t follow the same time/space coordinates as your generalized knowledge and world-view. Non-declarative memory is largely unconscious: if you try to remember each step in riding a bike or driving a car you’re likely to end up in a ditch.

A third category, sensory memory (visual, auditory, haptic [touch]), works in both explicit and implicit fields, both short term (is your left shoe pinching your foot again?) and long term (the smell of your grandmother’s house). Finally, your memory includes Recognition, which most of us retain pretty well—up to 70% even fifty years later—and Recall, where we’re lucky to manage 40% over the same time span.

Long-term memory’s our greater interest here, and I’ll stick my toe into an ocean where I’m only an admiring tourist: brain biology. I’ve spent enough time browsing in its books and journals and listening to lectures on YouTube to be very

¹⁰ <https://www.uclahealth.org/u-magazine/memories-are-made-of-this>.

¹¹ Chong reference/credit, 2018. Also Eric Kandel, 2015.

impressed with the question-formulation, the methodologies, the inventive experiments, and the careful attention to detail that scientists bring to their task.

Short version: each of our mammalian brain's hemispheres holds deep within its medial temporal lobe a **hippocampus**—there's that “hippo” word I couldn't remember!—named by a Venetian anatomist in 1587 for the seahorse it resembles. It's constructed of neatly organized, densely packed layers of pyramidal neurons and neuronal cell types, which have remarkable “plasticity,” that is, the ability of their synapses to strengthen or weaken over time, and consequently to grow. If you remember some—or all!—of this talk tomorrow your brain will have, however minutely, have grown).¹² These synapses have a complex chemistry: calcium, phosphorus and glutamate amino acids play especially important roles, as do the number of neurotransmitter receptors available on each synapse.

The hippocampus enables memory and learning—inextricable subjects—of several kinds: new short-term or “working” memory, long-term memory, verbal memory, spatial orientation and memory. It's also crucial for value-based decisions and the automatic selection of alternatives.¹³ Motor or unconscious

¹² Kandel, 2015.

¹³ “Driven by these observations and corresponding findings in animal models, [Nadel and Moscovitch \(1997\)](#) proposed the “multiple trace theory,” which posits that the hippocampus rapidly and obligatorily encodes all episodic information. This information is sparsely encoded in distributed ensembles of hippocampal neurons, acts as an index for neuro-cortical neurons that attend the information, and binds them into a coherent representation. The resulting hippocampal-neocortical ensemble constitutes the memory trace for the episode. Since reactivation of the trace commonly occurs in an altered context, it results in newly encoded hippocampal traces, which in turn bind new traces in the neocortex. This results in multiple traces that share some or all the information about the initial episode. Over time, multiple related traces facilitate the extraction of factual

memory is not located in the hippocampus but mainly in the cerebellum and amygdala. And a quick memory trick about this sea-horse memory organ: at the 0.15 blood alcohol level the hippocampus simply shuts down: that's what it's like to have your memory, your self, "black out."

Brain scientists use an fMRI to study these events; it measures oxygenated blood flow in the brain, indicating neural activity. For example, a clinician sets up a "learning session" and monitors the brain activity in the subject's hippocampus and its adjacent cortexes, then tests retention in a second session held either minutes or months later. The scientist measures the difference between the brain activity of that which is subsequently remembered and that of items forgotten. (I'm taking this from 2000 Physiology Nobel Prize winner, Holocaust survivor and charming autobiographer Eric Kandel, 174).¹⁴ Among the conclusions, long-term memory is not the outcome of some linear sequence of events but a "dynamic outcome of several interactive processes that involve multiple levels of brain organization" (Kandel, 163). The molecular underpinnings of memory work something like this: the neurotransmitter dopamine generates an intercellular messenger and a specific protein that are carried to a new cell and activates one of

information into a semantic representation of the gist of the episode. This information integrates into a larger body of semantic knowledge and becomes independent of the specific learning episode. Contextual information about the episode, which is required for episodic recollection, continues, according to this model, to depend on the hippocampus as long as the memory is viable." Kandel, 176. Eric Kandel is the University Professor and Kavli Professor of brain science at Columbia, and the Director of the Mortimer B. Zuckerman Mind Brain-Behavior Institute.

¹⁴ Petra Seeger's beautiful film *In Search of Memory* (2009) documents Kandel's journey and explores his ideas.

its genes, RbAp48, that initiates long-term memory connections “downstream.”¹⁵ A 2016 *Scientific American* article summarized the next step this way: When two neurons on either side of a synapse are active simultaneously, that synapse becomes more robust; the dendritic spine (the antenna on the receiving neuron) also becomes larger to support the increased signal strength. These changes in strength and size are believed to be the molecular correlates of memory.¹⁶

For explicit memory, successful retrieval is associated with greater global connectivity among the sites, with the medial temporal lobe acting as a hub for the interactions, and the hippocampus combining and retaining the outcomes by storing patterns, context, detail. Further, the hippocampus is anatomically connected to parts of the brain that are involved with emotional behavior, especially the amygdala, accounting for the return of strong feeling to dramatic memories. Long-term memories are “transferred downstream” to other parts of the brain: development rather than storage is the hippocampus’s main role. This is followed by what’s called “systems consolidation” (assimilation over shorter/longer periods), then “retrieval and reconsolidation,” processes much aided by sleep.

“Much of the long-term *storage* of the memory seems to take place in the anterior cingulate cortex”¹⁷ and regions of the pre-frontal cortex. “Some researchers

¹⁵ Kandell, 2015.

¹⁶ Among the recently discovered surprises in the body’s interconnectedness: Age-related memory loss may be reversed by boosting blood levels of osteocalcin, a hormone produced by *bone* cells, according to mouse studies conducted at Columbia School of Medicine.

¹⁷ Wikipedia: <https://en.wikipedia.org/wiki/Hippocampus>.

distinguish between conscious *recollection*, which depends on the hippocampus, and *familiarity*, which depends on portions of the medial temporal lobe.”¹⁸

Conversely, non-declarative or implicit memory relies mostly on other brain systems: namely, the cerebellum, the striatum, the amygdala, the basal ganglia, and, in invertebrate animals, simple reflex pathways themselves.¹⁹

Quickly, two interesting new findings. As we’ve seen, according to textbook neuroscience, memories form when neighboring brain cells send chemical communications across the synapses, or junctions, that connect them. Each time a memory is recalled, the connection is reactivated and strengthened. The idea that synapses store memories has dominated neuroscience for more than a century, but a new study by UCLA scientists may fundamentally upend it: memories may reside *inside* brain cells.²⁰ We’ll see. Second, researcher Micaela Gallagher, winner of the Melvin Goodes prize for Alzheimer’s research, has demonstrated to NIMH satisfaction—they gave her a 20 million dollar grant—that as we age the neurons that encode memories become *overactive*, not underactive.

¹⁸ *Ibid.* “A study was carried out on taxi drivers. London’s **black cab** drivers need to learn the locations of a large number of places and the fastest routes between them in order to pass a strict test known as **The Knowledge** in order to gain a license to operate. A study showed that the posterior part of the hippocampus is larger in these drivers than in the general public, and that a positive correlation exists between the length of time served as a driver and the increase in the volume of this part.”

Furthermore, a **randomized control trial** published in 2011 found that **aerobic exercise** could increase the size of the hippocampus in adults aged 55 to 80 and also improve spatial memory.

¹⁹ **Scoville** and Milner, 1957, Penfield and Milner, 1958, Milner et al., 1968, Warrington and Weiskrantz, 1968, Squire, 1992, Schacter and Tulving, 1994

²⁰ <http://newsroom.ucla.edu/releases/lost-memories-might-be-able-to-be-restored-new-ucla-study-indicates>. Stuart Wolpert, December 19, 2014.

The overactivity creates memory interference because the overactive neurons “fail to record new information.”²¹ We’re really speeding up, not slowing down...

My final thought in this section: scientists must depend on similarities between brains (or any subject) to generate knowledge about general patterns, but it’s equally true that difference matters: your brain is as unique as your fingerprints or your iris; it’s constantly changing, constantly in process; it’s not the *lumpen* “The Brain” but “Your Brain.”

PART III: A Little Philosophy

So how does this valuable information about the operations of our brains sit with my intentions to write a Montaigne-like reflective essay? Put simply, *it’s necessary but not sufficient*, just as brain biology is necessary to understanding memory but not a sufficient account of it. Granted, there are some natural scientists who believe that we will one day, and pretty soon, fully describe all the brain processes that enable memory, or, for that matter, all forms of consciousness—*and* that once we have done so, we will have “explained” memory and consciousness completely. On this account memory is just an epiphenomenon of the brain, alongside attention, vigilance, wakefulness;

²¹ Gallagher, 2019, 22-23. She won the the Melvin Goodes prize for Alzheimer’ research at Hopkins.

consciousness is entirely caused by brain processes, and is fully realized in the brain as features of that organ. David Dennett claims that our typical idea about the mind's distinctiveness is a "user illusion" that has evolutionary value—you can plan ahead, excellent for avoiding lions!— and is perpetuated by magical thinking and fantasies of self-importance. Period. As one hard AI theorist says, in a triumphalist tone, "We are our synapses." (Chong, 2018); or another, Jim Watson, the co-discoverer of DNA: "There are only molecules; everything else is sociology."²² Ironically, these tough-minded materialists' writings are full of metaphors that mysteriously ascribe agency to cells and neurons: they "compete," "prefer," "say," "tell," "win," "inhibit," "process," "perform," and so on: rather like medieval homunculi. In fact, no one has found the "neural correlates of consciousness" in the brain.

Conversely there are a few humanists and more than a few spiritual seekers who claim that memory and consciousness are indeed illusory, but also fully independent of brain activity.²³ This point of view appeals to anyone who anyone who is fed up with the hyper-material world and seeks a free-standing, meaningful alternative—some kind of life with more truth, wisdom, sanity, ecstasy that's independent of blood and bone. And these folks make equally strong, reductive claims, like this one:

²² Quoted in Rupert Shortt, "Idle Components: An Argument against Richard Dawkins." *TLS*, 12/13/19, 12.

²³ For example, from the Krishna Society: "Krishna instructs us from within our hearts as Paramatma, Supersoul, and the spirit and the spiritual master are considered to be the external manifestation of Supersoul": from super-soul through your heart to your mind.

The whole realm of private, subjective thought and feeling you have going on within you, that endless stream-of-consciousness in your head, that flow of thoughts, impressions and emotions that you think of as your inner self, your personal being—all that is a kind of madness and illusion, all of it invented, concocted, by Maya. (Steven Gelberg)

So the guru—again, not every guru!—seeks to eliminate both the material and the subjective worlds in the name of *panpsychism*—consciousness is everywhere— or another Higher Truth, while the reductive scientist—not the norm!—tries to make all experience fit inside his powerful but limited explanatory method. Michael Robbins summarizes the reductionist’s blind spot: “If you simply rule in advance that the mind must be physical and assume that an understanding of consciousness must be a materialist understanding, because scientific materialism is obviously correct, you end up looking for your keys under the streetlamp because that’s where the light is.” I’m writing against both reductionist and guru. The material world has its numinous side, and the ecstatic wouldn’t exist without nerve firings. And I’ll add a historical element which both camps ignore: It has often been noted that metaphors for mind and brain are drawn from the technological advances of the day. For Descartes, the brain is a sort of water pump; for Freud, a sort of steam engine with limited energy. Now it’s a computer. Tim Parks puts it nicely: “When it comes to consciousness, we are all repositories of quantities of evidence far richer than any available in the neuroscientist’s laboratory” (Parks, 352).²⁴

²⁴ Parks attempts to explain the theory of psychologist Ricardo Manzotti of “spread mind,” that “all experience is perception, and all perception is physical objects. Experience is not experience of something, it just is that thing.” (Parks, Robbins). It’s beyond the scope of my paper, and also beyond my understanding, way beyond.... I’ll

Necessary and sufficient, the antecedent and the consequent²⁵: these favorite phrases of logicians for determining truth let us work from both sides of the divide I've just described, and gives us a way to join them. Just to be clear, I don't think memory is a free-floating manifestation of Spirit connected to the cosmos. It's fully anchored in our bodily selves—and note that I said bodily, not “the body”: that is, in a living organism, not an abstract, mechanistic construction or a corpse.²⁶ To quote Martin Heidegger, “We do not ‘have’ a body; rather, we “are” bodily,” (Heidegger, *Nietzsche I*, 99)²⁷ and prize “that subtile knot that makes us man” (John Donne, “The Extasie”). One barrier to reconciling this is the sharp body-soul distinction drawn first in Plato, then in traditional

just note another recent, and unread, attempt to “solve” the mystery of consciousness included in Robbins' essay: Michael S. Graziano, *Rethinking Consciousness: A Scientific Theory of Subjective Experience*.

²⁵ “N if S”, “S only if N”, “S implies N”, “N is implied by S”, $S \rightarrow N$, $S \Rightarrow N$, or “N whenever S”.... . Devlin, pp. 22–23.

²⁶ “Antonio Damasio (*Descartes' Error*) has continued to develop and refine a theory of consciousness as a feature of homeostatic processes and the feelings that have evolved in organisms with the advent of a nervous system, a theory that involves the whole body and its environment, not just the brain. (See *The Strange Order of Things*, 2018.)” Siri Hustvedt in LitHub, 12/10/19. Hustvedt continues: [There are] “complex arguments in the philosophy of biology about how to define life, a species, organismic boundaries, and what agency means in everything from a cell to a whole creature, debates that bear directly on the problem of consciousness.” ““In *The Strange Order of Things*, Antonio Damasio presents a new vision of what it means to be human. For too long we have thought of ourselves as rational minds inhabiting insentient mechanical bodies. Breaking with this philosophy, Damasio shows how our minds are rooted in feeling, a creation of our nervous system with an evolutionary history going back to ancient unicellular life that enables us to shape distinctively human cultures. Working out what this implies for the arts, the sciences and the human future, Damasio has given us that rarest of things, a book that can transform how we think—and feel—about ourselves.” —John Gray, author of *Straw Dogs: Thoughts on Humans and Other Animals*. Damasio is but one voice in the burgeoning fields of the philosophy of biology and the biology of emotions developed, I understand, by thinkers and scientists committed to the phenomenological or emergent view of “the bodily.” These are topics beyond the scope of this essay, and my competence as well.

²⁷ The same idea is elaborated by philosopher Edmund Husserl: “actual, lived bodily (*Leib*) experience” not the frozen or abstract *Körper* of the dissecting table.

monotheistic theology, and the parallel secular body-mind distinction we've inherited from the philosophical tradition of Descartes' *cogito ergo sum*). The experiences we sometimes label "higher consciousness"—runner's high, "flow" states, chemically induced euphoria (think pinot noir or White Widow cannabis), lucid dreaming, aesthetic visions, out-of-body experience—all have material anchors (endorphins) but are not identical with those anchors.

Heidegger and Descartes lead to my little foray into philosophy, and to say a few things about consciousness itself, the larger arena in which memory operates, and therefore fundamental to our understanding of it. Here's a common sense/pragmatic definition of consciousness: those states of sentience that begin when we awake from a dreamless sleep and continue until we go to sleep again, or otherwise become unconscious, or die.²⁸ French philosopher Henri Bergson (*Time and Free Will*) anticipated William James' coinage of "the stream of consciousness": "[consciousness is]...a single sentence that was begun at the first awakening... a sentence strewn with commas but in no place cut by a period."

John Searle is my mentor here. Consciousness is obviously one feature of the brain. But he rejects the reductive "I am my synapses" view in favor of a notion of "emergent cause:" mind *emerges* from brain in the same way that the wetness of water emerges from the joining of hydrogen and oxygen. So while it's

²⁸ Here's a parallel overview from a standard psychology textbook (Lumen Learning): "Consciousness is the quality or state of being aware of an external object or something within oneself, such as thoughts, feelings, memories, or sensations. It has also been defined in the following ways: sentience, awareness, subjectivity, the ability to experience or to feel, wakefulness, having a sense of selfhood, and the executive-control system of the mind."

true that our conscious life requires the activity of gazillions of neurons, dendrites, synapses, it is not *itself* a property of any of those individual elements. "You can't disprove the existence of conscious experiences by proving that they are only an appearance disguising an underneath reality, because where consciousness is concerned the experience of consciousness IS the reality." (1999)

Another philosopher, Jerry Fodor (*TLS*, 5/17/02, 4), adds that the great difficulty for brain scientists—indeed for any scientists and scientific theory—is getting the crucial right level of description for saying how brain activity and psychology connect. If you work solely from synapses, then it's like trying to describe New York City by looking at individual bricks in the buildings: you'll say many true things about how bricks work with their neighboring bricks, but not very much about the city. Without those bricks there wouldn't be a city, but....²⁹

In sum, consciousness, with memory, is a real part of the real world. It is not an illusion or epiphenomenal or simply "material." Consciousness functions

²⁹ Consider the example of pain. You've just stubbed your toe at 2:00 AM while shuffling toward the bathroom, a common enough experience for our age group. Is pain the nerve firings in your offended stub? Well, it wouldn't exist if it wasn't for those firings, but it's not identical with those firings. Awareness of pain signals depends on specialized sensors, ones designed to pick up signs of tissue damage. But they are not pain fibers since what they sense is not "pain" — that can exist only in our consciousness. The experience of pain takes place in the mind, produces agonies, self-pity, and many bad words, none of which are identical to nerve firings. Another point: Under stress—fleeing a swarm of angry bees, for example— we don't experience pain that would get our attention if we were at rest. The same pressure passes through the nerves, but if consciousness doesn't register them as pain, they don't signify. Phantom pain merely dramatizes this truth: this happens because pain exists only in the brain, which forms a "body image" (like driving). Philosophers call this phenomenon "qualia," the inner qualitative states of awareness that we all equate with our selfhood. Qualia is *the* problem of consciousness for strong AI/biologists.

causally in our lives (just raise your arm).³⁰

One can trust that future science will unlock the physical secrets of consciousness (neuroscience is not yet very advanced, and science has a very good track record). But consciousness is unlike other phenomena: an account of *how* the brain generates behavior (the kind of account scientists hope to attain) is not *by itself* an account of the consciousness *behind* the behavior.³¹ Third person descriptions, however minute, can never completely account for it.³²

³⁰ Nobel prize-winning Darwinian physiologist Gerald Edelman's account acknowledges this: "The brain can speak to itself and the conscious brain can use its discriminations to plan the future, narrate the past and develop a social self."³⁰ Is consciousness the same as spirit? If you want to call the uniqueness of each individual consciousness a soul, that is all right with me. But there is a problem none of us likes to face. When the body goes, we go." The interview continues: "Indeed, you say the main purpose of your recent book, *Wider Than the Sky*, is "to disenthral those who believe consciousness is metaphysical." Edelman's response: "It is silly reductionism, of course, to claim that you and I are just bags of molecules. But I do not believe consciousness arises from spooky forces. I don't believe in some Cartesian dualistic domain that is inaccessible to science. The brain is embodied and the body is embedded in its environment. That trio must operate in an integrated way. You can't separate the activity and development of the brain from the environment or the body. There is a constant interplay between what is remembered and envisioned—an image—and what is actually happening in the senses. We now know that this interplay is enabled by reentrant interactions between the thalamus and cortex. First, signals enter my brain through this so-called dynamic core. Later, I can "see" images with my eyes closed. But I'm using the same circuits, only in a broader, more general and unique way—perhaps stimulated by a pleasurable memory or an ambitious idea. The brain can speak to itself and the conscious brain can use its discriminations to plan the future, narrate the past and develop a social self." "Interview with Nathan Gardels" in *New Perspectives Quarterly* 21:3 (Autumn, 2004), 62-64.

³¹ William Seager reviewing David Griffin's *Unsnarling the World Knot*, puts it this way: "This is why consciousness seems to disappear as we pursue the physical resolution of the neurological complexities which underwrite our behavioral capacities."

³² It's long been known that use of first person always implies the "presence" of a second person's consciousness: An I addressing a You: "There lies in the primordial nature of language an unalterable dualism, and the very possibility of speech is conditioned by address and response. Even thinking is essentially accompanied by the inclination toward social existence, and one longs for a You who will correspond to his I." Scientist Wilhelm von Humboldt (1767-1835): cited in Hustvedt, 238. Even newborns have what's termed "primary intersubjectivity," a pre-theoretical, pre-conceptual interpersonal relation with their caretaker that precedes any self-recognition (Hustvedt, 365).

One more important topic before my peroration: memory isn't just individual and subjective. We speak regularly of family memory, civic memory, cultural memory (the Bible, for example), institutional memory (this Club, among many organizations you belong to), historical memory (we're all very aware of the memorializing—and strategic forgetting—involved in the ideologies of nations): these are all powerful social realities that interweave with our individual recollections, and each of them has dynamics worthy of a separate paper. We Americans prize re-inventing ourselves,³³ forgetting who we were in the name of freedom and creativity, and sometimes (wrongly) urge immigrants to forget their past and meld entirely into our culture. Amnesty, a deliberate legal and personal forgetting, is a vital concept for social recovery: think Truth and Reconciliation Commissions in South Africa, Northern Ireland.³⁴ The statute of limitations is another kind of legal forgetting.³⁵ Each of them adds a layer to our individual

More elaborately, here's philosopher Maurice Merleau-Ponty on the same subject: For him the perceiving body is the "I" and others are lived through this corporeal reality. He underscores a relation between self and other, in which the other is always entwined in the self, although the two are neither identical nor confused. "Between my consciousness and my body as I experience it, between this phenomenal body of mine and that of another as I see it from the outside, there exists an internal relation which causes the other to appear as *the completion of the system*. The possibility of another person's being self-evident is owed to the fact that I am not transparent for myself, and that my subjectivity draws its body in its wake." (1962, 352)

³³ Emerson, "Self-Reliance": "Why drag about this corpse of your memory, lest you contradict something you have stated in this or that public place? Suppose you should contradict yourself; what then? It seems to be a rule of wisdom never to rely on your memory alone... but to bring the past for judgment into the thousand-eyed present, and live ever in a new day." (*Essays*, 41)

³⁴ In John Sayles' movie *Lone Star* the Chicana history teacher Pilar urges us to "Forget the Alamo."

³⁵ In 1200 the Archbishop of Canterbury began writing down all land transactions. This changed the nature of the law, which before had relied on the "living memory" of a community's elders. There was now no way to adjudicate disputes that occurred well

memories because each of them has helped to shape both the content and the form of how we remember.

before 1200, so in 1275 the Statute of Westminster was instituted, creating a "statute of limitations" for all disputes that began before 1189. See Hyde, 286-7.

PART IV: Peroration. “The Blessings of Forgetfulness”

“Memory is your primary source material because memory is your body as it was in the world and the world as it was and will be: memory is the people you have lived with or wanted to love: we’re bodies filled with reminiscences about the ghosts in sunlight....”

Hilton Als, commencement address at the Columbia School of the Arts, 5/21/14.

“We are made up of layers of time. We move chronologically—as we must, we have no choice—but our imaginative life, our emotional life, our mental life, doesn’t move in straight lines. It moves more like a boomerang, you know, the thing that keeps coming back and back. Things you were, places you were, who you were, it just returns to you.”

Jeanette Winterson, *LAT* interview, Oct 13, 2019

“Forgetting,” said Diotima, “is the departure of knowledge. We are never the same, always changing, as knowledge departs and we study in order to replace what we have lost. Forgetting allows for constant renewal, and so for immortality.”

Plato, *Symposium*, 208A

Let’s begin with what we so easily forgot during my dark opening: forgetting is also a blessing! If we remembered our lives by the hour, or day, or even by the week, we’d be at best immobilized, and more likely in a lock-up. Oliver Sachs is among the many neurologists who have recounted the nightmarish agonies of those few souls afflicted with “Hyper-thy-mesia,” superior autobiographical memory or “HSAM,” who have near-total recall—sometimes voluntary, sometimes not—of virtually every detail of their lives. Sachs calls it “incontinent nostalgia”

(1984, 14).³⁶ Most of them are paralyzed, made miserable, by the affliction.³⁷ He also believes—as did Plato—that we forget in order to rediscover, to forge new connections in our brains and imaginations, and thus to create anew (2005). Lewis Hyde takes this up, arguing that memory functions best in tandem with forgetting, and, more radically, “Every act of memory is also an act of forgetting.” (It maddened St. Augustine in *The Confessions* that he could remember forgetting at all!). For Hyde, forgetting has at least two benefits: “a mind can become too attached to its concepts or thought-habits and needs to drop them so as to attend again to detail; in the other a surfeit of detail clogs the flow of thought and must be winnowed so as to reveal the larger shapes of concept and abstraction” (Hyde, 39). (Note parenthetically that Hyde, borrowing from French psychologist Pierre Janet, sees memory as an *action*, “the action of telling a story,” *not* a mechanism.)

³⁶ The protagonist of Borges’ tale, “Funes, The Memorious,” remembers everything, right down to the particular light that struck a particular tree at 3:06 in the afternoon. He can’t make any generalizations, because they require forgetting difference in order to compare. Sad fate! In the same story Borges proposes that “memory plus oblivion = imagination,” creativity requiring forgetting in order to see afresh.

³⁷ The reason why people with hyperthymnesia are able to remember so much is because some parts of their brains are abnormally large. For example, the caudate nucleus is much bigger. This part of the brain stores automatic memories. And even these unusual people—less than 100 are known in the world— can’t remember everything; if you could, it would be entirely paralyzing. The classic study is of a woman known as “AJ” (real name Jill Price); she reported that the constant, irrepressible stream of memories was “non-stop, uncontrollable and totally exhausting” and “a burden” (Parker, 40). She would lose herself in her memory, and struggle to live in the present or future because she was more or less permanently, and involuntarily, living in the past. Physiologist Eric Kandel wryly commented that the misery of HSAM suffers “delighted” him because it made memory loss more palatable! Another bit of good news from Kandel (2015): Age-related memory loss comes in part from the loss of a chemical produced in bone that affects connections in part of the hippocampus known as the dentate gyrus, and is not directly related to, or a forerunner, of Alzheimer’s.

Sidebar on nostalgia: frequently derided, as in “soggy with n....” many psychologists now celebrate its value for those recovering from trauma, especially war trauma: it yields a stability that can sustain.

Athletes and soldiers prize forgetting past defeats and beginning again; unrelenting memory can undermine their morale. Psychoanalyst Adam Phillips writes, “People come for psychoanalytic treatment because they are remembering in a way that does not free them to forget” (22). Memory and Forgetting intertwine in many paradoxical ways: I bet each of you told your teen-age kid that they could “forget” about having the car on Saturday night, meaning that they should remember that they can’t have it. God’s commandment to the Jews (Deuteronomy 25:19) that they “blot out the memory of Amelek,” whom God had cursed for attacking them, both preserves and obliterates their enemy. Even resisting forgetting can also be one of the uses of forgetting.³⁸ Hyde’s refrain sums it up: “Nothing can be forgotten which was not first in mind.”

Our English word “forget” comes from old High German: the “for” prefix adds abstaining (as in “forgo”) to the German *getan*, to hold or grasp. So we let go of a memory, we drop it. But the Greek is even cooler: not letting go, but erasing, concealing: Forgetfulness is *lethe*, from the verb “to escape notice.” Hence the famous river of Hades, Lethe; just as the Athenians honored a state of Memory, they also built an altar to Lethe, to Forgetfulness, in the Erectheum on their Acropolis to remind themselves to forget the mythic dispute between Poseidon and Athena for the naming of their city: keep Poseidon happy!³⁹ They omitted a day

³⁸ Søren Kierkegaard, “Forgetting is the shears with which you cut away what you cannot use, doing it under the supreme direction of memory. Forgetting and remembering are thus identical arts, and the artistic achievement of this identity is the Archimedean point from which one lifts the whole world. When we say that we consign something to oblivion, we suggest simultaneously that it is to be forgotten and yet also remembered.” *Either/Or*.

³⁹ Plutarch, *Moralia*, VIII: *Table Talk*, Books 106.

from their calendar to be sure that they remembered to forget that founding discord. It's opposite or negative is "*a-lethe*", from which Greek gives us *aletheia*, "truth" that which is taken out of hiding, calling into our minds what was concealed, veiled. The Greeks linked *aletheia* with memory, justice, speech, light and praise, and Lethe with oblivion, hiddenness, darkness and blame (Hyde, 12, 40). Truth is opposite to all concealment, not simply lies. So, for the ancients, memory and forgetting are joined, incomplete without the other. And when we can forget ourselves and flow freely in music, in love, in nature, then we experience that unself-conscious happiness I said before that we so easily forget. Self-making feeds on the past *and* the time to come; self-being forgets itself in the moment. Forgetting has many benefits: for one, Marcel Proust famously celebrates the redemptive force of sudden, involuntary memories—things that have been forgotten but not lost—that have their power to reshape our lives *because* they have been forgotten. In other words, this is the opposite of trauma.

Fleshing out my optimism, then, I'm enamored of the fluidity, the creative, multi-layered plasticity, of our memories. My memory's labyrinthine, bottomless, and I can never master it; that might make some melancholy, but delights me: I'll never come to the end of its holdings. I've ditched—OK, pretty much ditched—the simplistic real vs. constructed binary (memory's always either right or wrong), and rely both on what's most vivid and resonant, and what's slightly out of focus. "Constructed," after all, doesn't mean arbitrarily fabricated or false: a story becomes deceitful only when we are not honest when we begin to tell it. I happily accept this potentially-limiting-yet-actually-liberating account of memory's craft.

Only in memory can you place, organize, understand—and it integrates so well with my perceptions, as when I encounter a familiar face. Memory forms a kind of friendship, a friendship with the more necessary parts of myself. One day my past may seem like a distant relative, hard to bring into focus; other days it's immediate, emotion-charged, more real than the space I'm staring into. One of my most treasured composite memory is a composite; I date it to 1950 (our meeting number!), when I'm 10, but I'm equally four or six or eight seeing the same thing: I'm a room away from our family kitchen, looking up with my six and eight year and ten old eyes as my parents, in the kitchen, cooking, drying dishes, whatever, suddenly slip into each other's arms and twirl once or twice, Ginger and Fred, smiling as though they were at the Palladium, and then parting with a kiss. No music, no words, and no self-conscious portrait-making for their kid or anyone else: they just did it, and loved it, and loved each other, and it flowed out of them into every room. They do it again, still, in my imagination (aren't the dead always present tense for us?).

I've recognized that memories also like to interbreed, and I try to draw on that fertility. The act of remembering alters memory?—well and good!⁴⁰ As John Searle noted, there's no continuous, cumulative sense of self without that craft,

⁴⁰ "Memory's not a hard drive.... It's a stage and a director, and over time the play changes, the characters are changed, but it's a funny play because we lose sight of what those characters once were to us. Memory...is a thing in motion, and because we are passengers without a frame of reference, the motion is imperceptible, so that at any given point in time all we have is a set of memories, and things of the instantaneous present and not the past.... Every memory is a work in progress." Zia Haider Rahman, *In the Light of What we Know*.

even though the narrative may alter over time, reappear in new patterns, and yield a coherence that both enables and distorts. And that's good, not a failure in our memory's wetware; acknowledging memory's multivalences enables us to integrate our experience without immobilizing it. We know the limits, and can put them to use. And I also try to honor the wider stage: my memories don't foreground History or Culture, yet those forces help determine what I recall, and why. Do those forces undermine my freedom? — no, understanding them broadens the base of my self-understanding.⁴¹ So, individual impressions, family immersion, class/culture/history: all are in play, playful, part of my play. They're both authentic and reconstructive. I know that events I'm "certain" happened in such a way may return in quite different trappings a year hence. And if I'm lucky, memory and form will work together for me, discovering patterns that make it possible to remember other things that can enrich and illuminate my history. And was the pattern already "there," waiting to be found? Perhaps, perhaps not.⁴²

⁴¹ The late Benjamin Libet's famous experiments: he would tell his subjects to perform some intentional but trivial act, and to do so every so often as they felt like. But he asked them to observe on a clock exactly the point at which they had made their mind up to do it. He found there was a brief gap (0.2 seconds) between the increased brain activity that marked the intention, and the conscious decision to do "Z". This 'readiness potential', prior to the subject's conscious awareness; the brain "decides" to do something before the mind is aware of it. So, he concluded, our experience of freedom is an illusion. BUT, quoth John Searle, this is an "extremely unwarranted" interp.: the cases in question are all cases in which the subject has already made up his mind to eventually form an action, and this is why the brain's activity precedes it: the presence of the "readiness potential" does not constitute a causally sufficient condition for the performance of the action. For example, the person might decide NOT to push the button. Readiness potential is not a condition that is *sufficient* to cause the act. It is associated w/ the act but does not determine it. Is there a flaw with the experiment, then?

⁴² One last philosopher, who takes up my final point: not how we remember, but how we hope to be remembered: legacy, not retrieval. Samuel Scheffler offers a provocative

I'll end near where I began: with Montaigne. You've probably noticed already that I followed the trajectory of his 1571 self-analysis: first the bad news, then the good:

“There is not a man living whom it would so little become to boast of his memory as myself, for I have scarcely any at all, and do not think that the world has another so marvelously treacherous as mine. My other faculties are all sufficiently ordinary and average; but in this I think myself very rare and singular, and deserving to be thought famous.”

So I'm raising a glass to the happy reality of memory loss: that I've forgotten 98% of my experience makes my understanding of my experience, really, my selfhood, possible. My Apple may remember everything, but I'm delighted that I

thought-experiment about death and “immortality.” His premises: Our achievements and values are always future-oriented; whatever we value, we want them preserved and, if at all possible, sustained. We project our agency into the future via one or more narratives (family and friendship, institutions [“Johnston Center” for me]), things we've built, and so on. Now, imagine that the earth will be destroyed a month after your death by an asteroid, or the human race is suddenly made infertile, as in P. D. James' novel *The Children of Men*. Wouldn't that undermine all possible empowering consequences for your actions? Why worry about curing cancer or global warming? Why procreate? Why go to work or create art? Personal extinction does not undermine our values, but species extinction does. Scheffler's conclusion: We require *collective* memory far more than we need any individual immortality; the ongoing existence of humanity is more important to us than our individual survival, which we know must have limits. “The coming into existence of people we do not know and love matters more to us than our own survival and the survival of the people we do know and love” because they will carry on the same/similar activities and value them as we have. So while being recalled as individuals after our death is valued, we know its limits from our own experience and rely more deeply on the collective memory. The place of our work in traditions and communities that extend beyond our own lives is a condition of their having value, and of our motivations. Not everything of course—friendship, personal comforts and pleasures, games—lives on past our death, but if we had only those things, we'd feel our life was impoverished. So we are dependent on the survival of humanity into the future: yet one more powerful argument for environmental responsibility.

don't. Standing on the shoreline of memory, I'll continue writing my own memoir, journeying along the streets of my youth and young adulthood, knowing that, like all of us, I'm enmeshed in what I took with me when I left. And for my next Fortnightly paper I'll revert to form and write on something from the ancient world—the Amazons, for example.

If I remember.

**“On Memory”
Bibliography**

- Baddeley, Alan. *Essentials of Human Memory*. London: Psychology Press & Routledge Classic Editions, 2014.
- Bartlett, Frederick. *Remembering: A Study in Experimental and Social Psychology*. Cambridge: Cambridge UP, 1950.
- Bergson, Henri. *Time and Free Will: An Essay on the Immediate Data of Consciousness (Essai sur les données immédiates de la conscience, 1889)*. New York: Dover Publications, 2001.
- Block, Ned. "Consciousness, Big Science and Conceptual Clarity" in *The Future of the Brain: Essays by the World's Leading Neuroscientists*. Princeton, New Jersey: Princeton UP, 2016.
- Borges, "Funes, The Memorious" in *Labyrinths: Selected Stories and Other Writings*. New York: New Directions, 1962.
- Chalmers, David. *The Conscious Mind: In Search of a Fundamental Theory*. Oxford: Oxford UP, 1997.
- Changeux, Jean-Pierre. *The Good, the True, and the Beautiful*. New Haven, Conn: Yale UP, 2012.
- Chen, Chong. *Strategic Memory: The Natural History of Learning and Forgetting*. Brain and Life Online Publishing, 2018.
- Cicero. *De Oratore. On the Orator, Books 1-2*. Cambridge MA: Loeb Classical Library, 1942.
- Damasio, Antonio. *Descartes' Error: Emotion, Reason, and the Human Brain*. New York: Putnam, 1994.
- _____. *The Strange Order of Things*. New York: Vintage, 2018.
- Dehaene, Stanislas. *Consciousness and the Brain: Deciphering How the Brain Codes Our Thoughts*. New York: Viking Press, 2014.
- Dennett, Daniel. *Consciousness Explained*. New York: Little Brown Back Bay Books, 1991.
- Detienne, Marcel. *Masters of Truth in Archaic Greece*. Cambridge, MA: Zone Books of MIT Press, 1999.

- Devlin, Keith. *Sets, Functions and Logic / An Introduction to Abstract Mathematics* (3rd ed.). London: Chapman & Hall, 2004.
- Draaisma, Douwe. *Metaphors of Memory: A History of Ideas about the Mind*. Cambridge: Cambridge UP, 2001.
- Edelman, Gerald. "Interview with Nathan Gardels" in *New Perspectives Quarterly* 21:3 (Autumn, 2004), 62-64.
- _____. *Wider Than the Sky: The Phenomenal Gift of Consciousness*. New Haven: Yale UP, 2004.
- _____. and Giulio Tononi. *A Universe of Consciousness: How Matter Becomes Imagination*. New York: Basic Books, 2000.
- Edelson, Sharot, Dolan, Dudai, "Following the crowd: brain substrates of long-term memory conformity." *Science*, 2011 Jul 1, 333(6038):108-11.
- Emerson, Ralph Waldo. *Emerson's Essays*. New York: Thomas Crowell, 1951.
- Foer, Joshua. *Moonwalking with Einstein*. New York: Penguin Books, 2012.
- Gallagher, Micaela. Interview in the *Colgate University Alumni Magazine*, Autumn 2019, 22-23.
- Gelberg, Steven. <https://surrealist.org/cults/gelberg2.html>
- Goff, Philip. *Galileo's Error: Foundations of a New Science of Consciousness*. New York: Pantheon, 2019.
- Groopman, Jerome. "The Resistance: Can Science Help us Change our Habits?" *New Yorker*, 10/8/2019, 83-85.
- Heidegger, Martin. *Nietzsche I and II*. New York: HarperOne; Reprint edition, 1991.
- Hesiod. *Theogony*. Translated by Dorothea Schmidt Wender. New York: Penguin Books Reprint, 1976.
- Hustvedt, Siri. "What Are We?" in *A Woman Looking at Men Looking at Women: Essays on Art, Sex and the Mind*. New York: Simon and Schuster, 2016.
- Hyde, Lewis. *A Primer for Forgetting*. New York: FSG, 2019.

- Interlandi, Janeen. "New Estimate Boosts the Human Brain's Memory Capacity 10-Fold." *Scientific American* 314, 2 (February, 2016).
- Jacobson, Roni. "The Persistence of Memory." *Scientific American* 312, 4, 14-16 (April 2015).
- James, William. *Psychology: A Briefer Course*. New York: Collier Books, 1962.
- Kandel, Eric et al. "The Molecular and Systems Biology of Memory." *Cell*: 157, 1 (March, 2014), 163-186.
- _____. "We Are What We Remember." 2015 Columbia University Lecture (<https://www.youtube.com/watch?v=IV4nDxG-nfc>).
- Kham Amina. "Love, factually? Hard to say, exactly." *Los Angeles Times*, 12/21/2019, II, 2.
- Kierkegaard, Søren. *Either/Or*. New York: Penguin Classics, 1992.
- Lumen Learning: <https://courses.lumenlearning.com/boundless-psychology/chapter/introduction-to-consciousness/>.
- Malcolm, Janet. "Thoughts on Autobiography from an Abandoned Autobiography." *New York Review of Books*, April 29, 2010.
- Mayo Clinic: <https://www.mayoclinic.org/diseases-conditions/alzheimers-disease/symptoms-causes/syc-20350447>
- Merleau-Ponty, Maurice. *Phenomenology of Perception*. London: Routledge and Kegan Paul, 1962.
- Montaigne, Michel de. *The Essays of Montaigne*. Trans E. J. Trechmann. New York: Random House, 1946.
- Newsome, Melba. "What Scientists are Learning from Early-Onset Alzheimer's." *Brain and Life*, October-November, 2019.
- Notopoulos, James A. "Mnemosyne in Oral Literature". *Transactions and Proceedings of the American Philological Association*. 69: 466.
- Parker E.S., Cahill L, McGaugh J.L. (February 2006). "A Case of Unusual Autobiographical Remembering". *Neurocase*. **12** (1): 35-49.
- Parks, Tim. *Out of My Head: On the Trail of Consciousness*. New York: Harvill-Sacker, 2019.

- Pausanius. *Description of Greece I*. Translated Peter Levy. New York: Penguin Books reprint, 1984.
- Phillips, Adam. "Freud and the Uses of Forgetting" in *On Flirtation*. Cambridge MA: Harvard UP, 1994.
- Plutarch. *Moralia*. Loeb Classical Library. Cambridge, MA: Harvard UP, 1969.
- Raaijmakers, J.G.W., and Richard Schiffrin. "Search of Associative Memory." *Psychological Review*, 188 (1981), 93-134.
- _____. "Spacing and Repetition Effect in Human Memory: Application of the SAM Model". *Cognitive Science* 27 (2003), 431-452.
- Rahman, Zia Haider. *In the Light of What We Know*. London: Picador, 2015.
- Robbins, Michael . "I Me Mind: The Unending Quest to Explain Consciousness." *Bookforum*. <https://www.bookforum.com/print/2604/the-unending-quest-to-explain-consciousness-23772>.
- Sachs, Oliver. "On Memory." *ThreePenny Review*, Winter, 2005.
- _____. "Speak, Memory." *New York Review of Books*, February 21, 2013.
- _____. *The Man Who Mistook His Wife for a Hat and Other Clinical Tales*. New York: Simon and Schuster, 1985.
- _____. *Uncle Tungsten*. New York: Vintage, 2002.
- Schacter, Daniel. *Searching for Memory*. New York: Basic Books, 1997.
- _____. *The Seven Sins of Memory: How the Mind Forgets and Remembers*. New York: Houghton-Mifflin Mariner Books, 2002.
- Scheffler, Samuel. *Death and the Afterlife* (The Berkeley Tanner Lectures). Oxford: Oxford UP, 2016.
- Scoville, W.B., and Milner, B. (1957). "Loss of recent memory after bilateral hippocampal lesions." *J. Neurol. Neurosurg. Psychiatry* 20, 11-21.
- Seager, William. Review of David Griffin's *Unsnarling the World Knot*. *TLS*, 12/3/99, 30.
- Searle, John. *The Rediscovery of the Mind*. Cambridge, MA: MIT Press, 1992.
- _____. *Mind, Language and Society*. New York: Basic Books, 1999.

- _____. TED talk “On Consciousness”
https://www.ted.com/talks/john_searle_our_shared_condition_consciousness/discussion
- Shaw, Julia. *The Memory Illusion: Remembering, Forgetting, and the Science of False Memory*. London: Random House UK, 2017.
- Squire, L.R. (2009). “The Legacy of Patient H.M. for Neuroscience.” *Neuron* 61, 6–9.
- _____, and Bayley, P.J. (2007). “The Neuroscience of Remote Memory.” *Curr. Opin. Neurobiol.* 17, 185–196.
- Tallis, Raymond. *On the Age of Certainty*. New York: Macmillan, 2002.
- U.C.L.A. publications: <https://www.uclahealth.org/u-magazine/memories-are-made-of-this>. Summer, 2016.
- Warrington, E.K., and Weiskrantz, L. (1968). “New Method of Testing Long-term Retention with Special Reference to Amnesic Patients.” *Nature* 217, 972–974.
- Wikipedia: <https://en.wikipedia.org/wiki/Hippocampus>.
- Winter, Alison. *Memory: Fragments of a Modern History*. Chicago: Un. of Chicago Press, 2013.
- Wolpert, Stuart. <http://newsroom.ucla.edu/releases/lost-memories-might-be-able-to-be-restored-new-ucla-study-indicates>. December 19, 2014.
- Wood, Wendy. *Good Habits, Bad Habits*. New York, FSG, 2019.

Memory" Precis
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02/20/2020

Memory is the bedrock of our selfhood, and because of that a major source of anxiety, especially in our Club's average age group. Its growing unreliability over time induces depression and worse, precisely because our entire sense of self is at stake. Taking Michel de Montaigne's informality and self-deprecating humor as models, the paper first catalogues our memory's make-up—declarative, subliminal, sensory—and its multi-faceted limitations, including "Memory's Seven Sins." The paper then takes up how our memories are constructed, not simply reproduced from a stable archive; our memories are an amalgam of images, overlays of earlier memories, oft-repeated family stories, social and cultural narratives. To remember is in good part to imagine and construct; there is no establishing a "pure relationship" with a single past.

An incursion into recent brain science—necessary but not sufficient to understanding our memories— leads to a short philosophical defense of memory and consciousness as full realities in themselves, not simply epiphenomenal outcomes of synapse connections. The paper ends with an upbeat peroration praising forgetfulness as a necessary partner of memory, and their constructed, malleable quality as fully authentic and good: it's what memory is, and we should celebrate it. One takeaway among several: Understanding how each of us characteristically narrates our memories and consequent self-understanding to the world—and especially to ourselves— is a surprising and invaluable road to expanded self-knowledge. Finally, the paper hopes to serve a broader purpose: supporting the autobiographical efforts of members, both in memoir writing and especially as their life stories weave their way into their own Fortnightly projects. "If they remember."

