The Changing Shape of Memory Architecture

by Robert Watkins

Throughout time man has sought to better understand the curious nature of memory. Many have compared memory to the space we experience in the physical world and this relationship has insinuated itself in different ways. Take for instance the phrase, "in the back of my mind," which suggests that forgotten memories have retreated from the forefront of our mental faculties. Another common way we associate memory with space is the way we imagine that our minds have a limited capacity to store data, as if the walls of our skulls defined the amount of information we can retain. It is not difficult to find other more extensive comparisons between space and memory throughout history. In her often quoted book on the subject of memory Francis Yates (1899 –1981) attributes the Greek orator Simonides of Ceos, (556–468 B.C.) with having developed the idea of using space to help him recall information (Yates, 2). Simonides imagined rooms in which he placed objects with symbolic significance. He then imagined walking through the space and coming across these objects which, through visual recognition, would trigger specific memories. Space has since become a metaphorical container for memory.

The philosopher St. Augustine (354–430) expanded this allegory when he

imagined memory as a much more vast space than that of a room.

> I come to the fields and spacious places of memory, where are the treasures of
> innumerable images, brought into it from things of all sorts perceived by the
> senses. This is stored up, whatever besides we think, either by enlarging or
> diminishing, or any other way varying those things which the sense hath come
> to; and whatever else hath been committed and laid-up, which forgetfulness
> hath not yet swallowed up and buried (Augustine, 210-11).

St. Augustine hinted at another spatial representation of memory, a vertical one in which

memories are either buried or brought to light. He also suggested that the mind

manipulates perception in the course of remembering by enlarging or diminishing the

images collected by the senses. It was Giulio Camillo (1480–1544) in the 16th century

who took visualization one step further and attempted to construct a physical space that

functioned like memory. He designed his "theater of memory" to resemble an

amphitheater, and though it was never actually constructed, the idea behind it has

inspired many scholars who have since written about memory.

Over history comparisons between space and memory have changed to reflect

advances in science and technology. In the 19th century phrenologists believed that the

repository of memory was located at the front of the human brain. Phrenological charts

illustrate a desire to locate the source of memory and attribute it with a space of its own

(see figure 1). In actuality modern science locates the source of visual memory in the back of the brain in the visual cortex of the occipital lobe (see figure 2). Memory capacity in computers is measured in bytes, a term foreign to 19th century thought. The idea that something so small as one of today's electronic devices could hold a large amount of information is most likely the inverse of what people once imagined. Despite differences in the characterization of memory, even today we compare memory with space, two radically different concepts. How has the shape of memory changed and what do these changes say about the way we relate to space and memory today?
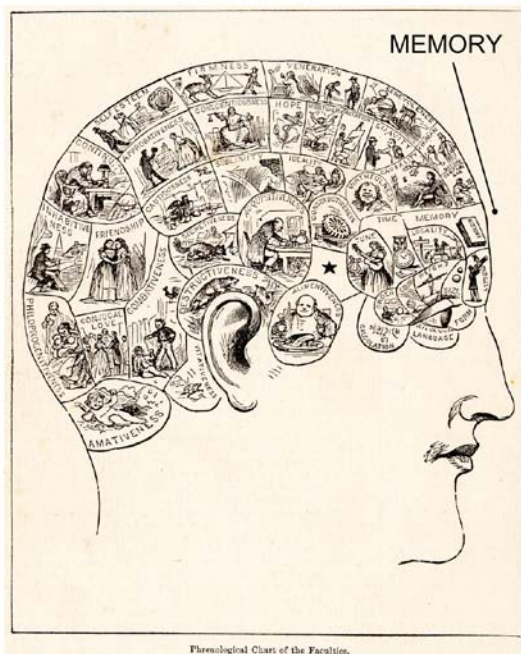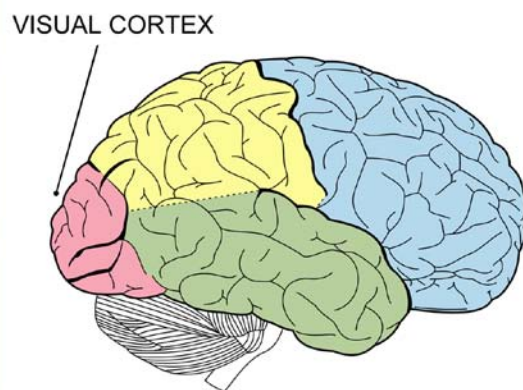

Figure 1. 1883 phrenology chart.   Figure 2. Location of the visual cortex.

Henri Bergson's (1859–1941) writing addresses the issue of space and memory ultimately revealing that the way we navigate space is a function of memory. Bergson

distinguished between practical and impractical memories: practical memories being

those that are a reaction to physical stimuli and impractical memories being those that

do not necessarily elicit a physical response. Practical memories, he explained, "grow

into a habit, and determine in us attitudes which automatically follow our perception of

things" (Bergson, 96). Impractical memories have less utility and therefore less

relevance upon the present because they do not culminate in action. Practical memories

are required to judge the spatial relationships (distance, depth, height) needed to move

around our environment.

It is impossible to divorce the body from this discussion because it is the

vehicle we navigate through space. St. Augustine acknowledged that all memories come

by way of the senses and are stored in the mind. Bergson considered the body a special

entity because it exists between our consciousness and the physical world. He also

believed that it is incorrect to locate memory inside the body.

> Itself an image, the body cannot store up images, since it forms a part of the
> images; and this is why it is a chimerical enterprise to seek to localize past or
> even present perceptions in the brain.: they are not in it; it is the brain that is in
> them (Bergson, 196).

Interestingly a passage on memory from St. Augustine's "Confessions" also hints at the

difficulty of locating memory in the brain.

> This faculty of memory is a great one, O my God, exceedingly great, a vast,
> infinite recess. Who can plumb its depth? This is a faculty of my mind,

belonging to my nature, yet I cannot myself comprehend all that I am. Is the mind, then, too narrow to grasp itself, forcing us to ask where that part of it is which it is incapable of grasping? Is it outside the mind, not inside? How can the mind not compass it? (Augustine, 246-47)

St. Augustine presaged phenomenological thinkers by wondering about the physical limits of the self. He addressed the theoretical difficulty of pinning memory down to an internal location from within which it comprehends itself. Bergson, like Augustine, suggests that the location of memory is not as important as its connection to our bodies. He describes the body as a "place of passage of the movements received and thrown back, a hyphen, a connecting link between the things which act upon me and the things upon which I act . . . " (Bergson, 196). According to Bergson the body which houses the mind acts as an intermediary between the self and the world it inhabits. Perception is simply the mind questioning what objects in our purview mean to our body. Because the body is squarely at the center of actions informed by memory we can safely say that memory plays a decisive role in the way we move and the way we interact with space.

Bergson uses memory to explain that perception can never be purely objective because it is always being mixed with impractical memories. He writes, "there is no perception which is not full of memories. With the immediate and present data of our senses we mingle a thousand details out of our past experience" (Bergson, 24). It is a wonder we function at all without these myriad recollections getting in the way of day

to day living. Even St. Augustine cited the necessity to drive away irrelevant memories

with "the hand of my heart, from the face of my remembrance" (211). While our

memories enable us to function they may also become a hindrance. The absence of

memory or the inability to recall how we should act in response to stimuli would

certainly result in the cessation of movement. Does an excess of memory mean the

inverse, a surfeit of movement? One writer suggests the opposite by associating a

particularly exceptional memory with paralysis.

In a short story by Jorge Luis Borges (1899–1986) entitled "Funes el

memorioso" the title character Ireneo Funes suffers a crippling accident which leaves

him with a miraculous memory and heightened senses. The story seems to suggest that a

perfect mimetic memory would be less liberating than we might think. So rich and

complex were Funes' waking memories that sleep became a welcome distraction. "To

sleep is to be abstracted from the world," the narrator explains (Borges, 9). Funes found

comfort in imagining a tract of recently constructed homes. He never saw the homes but

he could imagine them well enough for the houses to inhabit his mind and yet little

enough to prevent them from overwhelming him with maddening details.

> Toward the east, in a section which was not yet cut into blocks of homes, there
> were some new unknown houses. Funes imagined them black, compact, made
> of a single obscurity; he would turn his face in this direction in order to sleep.
> (Borges, 9)

Reconstruction, the cobbling together of details to create a single comparable memory works in much the same way Funes' character uses the abstract homes. When a memory is relevant to the present the process of reconstruction begins. As if to relieve the mind from the task of conjuring too vivid and detailed an image our memory steps in and culls enough information to reconstruct a satisfactory image. Memory is not only a figurative journey into the past but it is also a means of navigating the present. Too much memory or too detailed a memory, such as in Borges' character Funes' case, is as capable of impeding movement as the lack of sufficient memory.

Strangely enough the fictional character Funes resembles an actual person by the name of Solomon Shereshevsky (1886–1958). Shereshevsky's remarkable memory was the subject of neuropsychologist Alexander Luria's (1902–1977) book The Mind of a Mnemonist. Shereshevsky had a seemingly limitless memory due in part to his synesthesia which helped him to assign images to pieces of information, thus better enabling him to recall information. This technique, however, was not without problems. Shereshevsky, referred to as "Mr. S" in Luria's book, explains that some images were not as easy to recall, such as an egg that was too small to picture or a plane whose color caused it to blend in with the background image in his mind. The historical treatise on rhetoric entitled *Rhetorica ad Herennium* contains instruction on the use of images as

mnemonic devices, information Luria's subject Mr. S might have done well to commit to memory.

A passage in the *ad Herennium* describes the backgrounds against which one should imagine objects. It reads, "backgrounds ought to be of moderate size and medium extent, for when excessively large they render the images vague, and when too small often seem incapable of receiving an arrangement of images"(*ad Herennium*, 213). The author must have felt that the boundlessness of our imaginations necessitated limits on the size and nature of backgrounds lest the subjects find themselves lost within their own mnemonic landscapes. According to the text, more delineated backgrounds and images yield more expedient recollections. Another passage reads, "We ought, then, to set up images of a kind that can adhere longest in the memory. And we shall do so if we establish likenesses as striking as possible; if we set up images that are not many or vague, but doing something (*ad Herennium*, 221). This suggests that moving images or images depicting action lend themselves to recollection better than static ones. Bergson shows us that memory is inextricably connected to our bodies. It follows that because we perceive things with regards to how they may affect us physically images with a physical quality facilitate better recall than those images with little or no connection to our bodies.

The body is a vessel we pilot through the physical world and memory provides

us with a virtual map drawn from remembered actions. Our minds may be free to

wander where they will but our bodies are restricted by physical limitations. Fortunately

those same limitations also help us function. Bergson believes that the imagination is a

by-product of this struggle between the mind and body, more precisely between what

the eyes see and the mind remembers seeing. Here Bergson explains that the details of

past experiences take a toll on perception:

> In most cases these memories supplant our actual perceptions, of which we then
> retain only a few hints, thus using them merely as "signs" that recall to us
> former images. The convenience and rapidity of perception are bought at this
> price; but hence also springs every kind of illusion (24).

While many people lament having a poor memory the failure to recall too much detail

may actually be more blessing than curse. Borges' character Funes and Luria's subject

Mr. S prove the difficulty of enjoying an ordinary life with a remarkable memory.

History records numerous attempts to improve our memory. These attempts to master

control of memory together with the desire to locate memory or give it form attest to

man's desire to contain something that captures our imaginations with its limitlessness

yet mocks us with its limitations.

Digital memory and the various ways with which we manipulate data today are

simply an extension of man's interest in mastering memory. Author Peter Matussek (b.

1955) draws comparisons between old and new memory architecture in his essay, "The

Renaissance of the Theater of Memory." He explains that, "[i]n the wake of advances in

interactive applications, the function of digital technology is no longer described merely

in terms of "storage and retrieval," but rather in terms of the performativeness of images

in motion" (Matussek, 5). Matussek believes that computer interfaces work on

principles found in ancient texts on memory. The computer's use of visual imagery in

the form of icons and immersive environments are comparable to the types of

mnemonic devices described in the *Rhetorica ad Herennium*. Other digital applications

also mimic early attempts to manage information.

Matussek writes that Giulio Camillo's memory theater resembles the way we

interact with data over the internet and reveals why the one seems more compelling than

the other. Camillo's theater, Matussek explains, was revolutionary as a precursor to

digital memory because it inverted pre-existing ideas about memory recall by reversing

the architecture. In Camillo's theater the subject imagines himself standing on a stage

looking outward. Instead of seeing spectators, the subject views tiers in an amphitheater

filled with objects representing different pieces of information (see figure 3). This marks

a change from a visualization in which the subject travels through space to one in which

the subject projects himself virtually outward into a space. This engagement with

information is repeated daily all over the world whenever someone accesses information over the World Wide Web. Compared to older models of memory, like that of Simonides, this describes a more passive relationship with information.

Figure 3. Guilio Camillo's *L'Idea del Theatro*

Matussek believes that another digital frontier, the virtual 3D environment, also encourages passive interaction, actually thwarting the experience of immersion it seeks to promote. He explains that "our imaginative activity diminishes in direct proportion to increased activity on the screen" (Matussek, 69). On the other hand, Matussek believes a closed system like Camillo's theater, actually stimulates the imagination. The imagination craves limits, its resistance to them helps fuel our fantasies. Camillo seemed to realize this and made it his goal "to find . . . an order that keeps the mind keen and shakes up the memory" (Matussek, 69). Bergson sought to find a middle

ground between imagination and memory. His theoretical tests prove that we function as human beings because we are neither ruled by practical memories nor are we slaves to our dreams. Camillo and Bergson agree that memory serves a valuable purpose but not to the exclusion of the imagination.

If an architecture exists that can adequately circumscribe the idea of memory in our minds it must be one that transcends the boundaries of our bodies without giving way to the limitlessness expanse of our imaginations. It should provide us the footing needed to move forward but avoid bogging us down with superfluous details of the past. So tied is memory to our bodies that models which are too cerebral miss the mark. Today "information architects" talk about "cloud computing" when describing digital memory storage and recall. This semantic solution represents yet another stage in memory architecture's evolution. Although the name suggests images of loosely aggregated data floating weightlessly above our heads, the specifics of cloud computing reveal something much more down to earth, specifically, large banks of servers housed in temperature controlled warehouses in undisclosed locations. Out of sight and out of mind these servers free us from the physicality of memory storage. It is no longer necessary to store data on external devices when mobile networking makes information accessible from almost anywhere.

Although historically man seemed bent on giving shape to memory, current advances in technology reveal a desire to deny memory space and shape. This may be due in part to technology's promise to liberate us from the burden of memory recall. Perhaps memory architecture was built upon the premise that by freeing us from seemingly unnecessary remembrances it would allow us to seek deeper for meaning within ourselves. The search to give memory form predicated a shift from the desire to reach outward to one reaching inward. The mysterious nature of memory was an extension of the expansive and largely unexplored ancient world. The mind was yet another frontier. In the same way that architecture allowed man to tailor spaces to his needs memory architecture created the means to manipulate the space between our ears. Today when we access information as if plucking it from the sky we take the invisible architecture of cyberspace for granted. Text and images flit across our screens like characters on a stage, a stage from which we have taken ourselves largely out of the picture. Web surfing, despite its colorful imagery, more closely resembles passive consumption rather than active engagement. A wealth of information is at our fingertips but travels so quickly and in so many guises that memorable attachment is easily lost. The connective tissue between memory and our bodies seems to grow thinner with time. We can hope that future iterations of memory architecture will help restore the

connection between mind and body but in light of current events it is more likely that

they will further distance us from ourselves and further blur the line between what is

real and imagined. If a model were capable of shifting the focus back upon the subject

and restoring connectivity between the body and the present without sacrificing

occasional excursions into fantasy, then perhaps such a model could help us re-imagine

Camillo's vision of a world in which we contemplate memory from center stage.

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