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Libraries of the Mind

What Happens after Reading

'Kopfbibliotheken': a new take on memory*

What happens after reading? The answer, this essay holds, is unknown but not unknowable. While the act of reading has been studied by literary scholars and psychologists since the 1970s, the long-term effects of reading have never been granted the status of a scientific problem. Those who believe in the educational effects of literature on reading minds tend to be skeptical of scientific reductionism. Brain researchers, on the other hand, may not deny the value of literature but will object that it's way too early to follow the trace of a book in the neuronal networks we call the mind. Their disciplines are forensic, focusing on damaged rather than healthy brains. The neurosciences are still busy understanding lobsters and rodents; no wonder that reading memories are not yet on their experimental agendas.

Literary studies are not subject to such constraints; the will to knowledge issues carte blanche to creative thinking grounded in intuition and experiential evidence. Reading fiction follows a different trajectory than reading non-fiction. Novels are, to a large extent, designed to be forgotten. As time passes, the book on the shelf becomes alienated from its virtual counterpart, the book in the mind. The latter takes on a life of its own, appreciating our own lives. Such intimations frame the following reflections on the nature of reading, the mysteries of the mind, the liquefaction of narrative, and worldview curation by virtual librarians. The abundance of librarious imagery in the following pages is a friendly gesture, intended to augment or enrich the technological metaphors of scientific memory research and to encourage a dialogue between the humanities and neuroscience.

The transition from studying 'while-reading' activities to coming to terms with 'post-reading' phenomena – an extension of the current paradigm which considers reading solely in terms of perception, cognition and comprehension – requires a novel framework. *Kopfbibliotheken* (libraries of the mind) is a pre-theoretical endeavor which may never yield a coherent agenda, let alone testable hypotheses; it seeks, first and foremost, to widen our perspective in cognitive literary studies. My key concept is inspired by Elias Canetti's novel *Die Blendung*, first published in 1935. Peter Kien, a mad sinologist, roams the streets of Vienna, haunted by memories of his inaccessible library. Like Kien, all readers possess remembered libraries; unlike him, most of us will not be able to recall every

single book in any detail. A deep romantic chasm separates the text from its memory.

My mind's librarian, that unappointed life scribe, is a messy fellow. The books I thought I knew refuse to add up to a neat collection. Instead of looking after them, my imaginary librarian encourages them to free themselves from the constraints of declarative knowledge (who needs precision?), to stray from the shelves (order is boring), to attach themselves to other archived memories in a most promiscuous manner, to willfully or unwittingly blend facts and experiences stored, allegedly, in different sections of my brain, and even to leave my library without filling in an order ticket or loan slip. In more mundane words, lots of things happen not just while reading but after reading; reflecting on the acquisition policies of our volatile, idiosyncratic libraries may yield valuable insights into those aspects or functions of the brain we generally call the mind or the self.

What the humanities bring to the methodological table of post-readerly inquiry are analytical skills honed by engagement with the most complex texts great minds have devised over two millennia; this engagement, in turn, feeds the creative play with what Mieke Bal has called travelling concepts.[1] Reading, cultural activity and cognitive charge, is a travelling concept par excellence. As Roland Barthes points out in *S/Z*, forgetting is not failure, signaling a reader's defeat, but a *sine qua non* of appraising literature.[2] I forget, he concludes, *because* I read.

Starting with analogies (libraries and librarians), my own account of reading is a less focused affair. It seeks inspiration in art (portraits of books and readers), attempts a phenomenological reflection of lived experience (imagine buying the same book twice), experiments with Greek, Latin, and Genette (architexture) and, loitering with intent, dabbles with the language of neuroscience (proteins). Like an escape room game, the library as a place, resource, and state of mind thus hosts a figurative quest; it begins with a memory, or non-memory, of forgetting Musil. But first, a painting.

The gaze of Ugolino Martelli

Books and readers have always inspired the visual arts.[3] Since medieval times, painters, sculptors, and performance artists have produced an amazing body of work capturing the essence of print culture: the educational, edifying and enlightening value of books, the sacred atmosphere of libraries, the inspirational qualities of writing, both spiritual and secular. Still lives like Liu Ye's *Books on Books* (2007) or installations such as Marta Minujín's monumental *Parthenon of Books*, proudly presiding over Kassel's Documenta 14 art exhibition in 2017, pay homage to the book as a signifier, the concept of committing thought to print. Undisturbed by human presence, which can only be intuited behind covers and spines guarding the efforts of solitary minds, these works invite audiences to contemplate food for thought without tasting it. The magic spell of the written

word is captured in the long tradition of paintings representing the act of reading as an enlightening, at times spiritual experience. Readers in a state of excitement or immersion, before or while engaging with somebody else's thoughts, populate the history of painting, from the Mérode triptych created in Robert Campin's workshop around 1430, to Roy Liechtenstein's *Reading Nude* (1992).

One interesting observation one can make when looking at books-and-readers art is that the reader's gaze, as rendered in painting, is often hard to interpret. It is not so much what they read or what they may be thinking that puzzles me, but the fact that it is impossible to determine when reading is *over*, when readers cross that fine line separating their contemplation of the world of the book from the return to the here-and-now or then-and-there. Occasionally, you may find representations of readers after reading, usually in a state of exhaustion, as in Wang Qingsong's politically subversive Laserprint *Follow You* (2013), which represents dozens of students who have fallen asleep among piles of books, while slogans on the wall remind them to "study well" and "progress everyday." Constantin Verhout's sleeping student in the eponymous portrait, an oil on wood painting from 1663, seems way more relaxed in comparison.

While in both cases readers have fallen asleep, Ugolino Martelli, portraited by Agnolo Bronzino in 1535, is clearly awake. His right hand rests on an open book, the index finger pointing to the end of a line on top of the page; the left is balancing another book on his thigh. Is he comparing the two books? Does he feel inspired by what he just read, the line his finger still lingers on? Or is he already somewhere else, someone else? The ephemeral transition from *while* reading to *after* reading, from being inspired to having been inspired, is a threshold or portal, the mind's lobby where the reader leaves, and the librarian takes over.

Figure 1: Agnolo Bronzino, *Portrait of Ugolino Martelli* (1535)[4]

You start a library, a book collection with a purpose, or rather a history of purposes, by filling shelves with books. Those books you've read you really own twice: the printed copy and its mental representation, safely tucked away in that corner of your brain which is dedicated to storing reading experiences – the library of the mind. Except that, for all we know, there is no such corner. The mind harbors a magic library. While shelved books may collect dust, but otherwise remain largely untinged by nature's changing course, the library of the mind is in constant flux. Christian Boltanski's impressive installation *Flying Books* (2012), a homage to Argentinian writer and librarian Jorge Luis Borges, can only begin to visualize the chaos inside, the liquefaction of narrative in trans-hierarchical, free-floating arrangements which would have delighted Marx and Engels: "All that is solid melts into air."[5] Or maybe not. Mind novels never converge

into a new, better library. They constantly change their shape, are attracted to other books, freely mingle and merge with films, or even get attached to non-literary memories, the sum of all these sedimented moments we call, for want of a better term, lived experience.

Libraries of the mind have neither spatial nor temporal boundaries. They expand and shrink, constantly rearranging their virtual stock as time passes, reorganizing their archives depending on changing preferences, the degree of happiness, sadness, or relevance associated with a reading experience. Sometimes your other self, the imaginary librarian in charge of your mental library, may even give away books without asking or even letting you know. It has happened to me. A couple of years ago I bought a copy of Robert Musil's classic *The Man without Qualities*, a novel on my ever-growing list of must-reads, only to discover that from my modest collection of early twentieth-century fiction Musil's black spine stared at me with reproach: how could you!

How could I forget Musil? Dozens of annotations and a date on the fly-leaf proved beyond doubt that my former self had indeed finished reading the whole novel, a gift dedicated to me by a dear friend on the occasion of a long forgotten birthday, on the thirty-first of March, in 1997. It must have felt quite an achievement, judging from the comments in the margins, demonstrating a major effort at understanding the deeper meaning of more than a thousand pages about . . . whatever. I hate to admit that reading Musil has left no trace whatsoever in my long-term memory. I couldn't recall a single scene, nor the name of the protagonist, nothing. A book without qualities? The joke was made several times in the months following the discovery, when I discussed forgetting Musil with colleagues and friends on various occasions. Some knowingly quoted "Möglichkeitsmensch oder Wirklichkeitsmensch?", Musil's terms (put bluntly) for idealists and pragmatists. One literary scholar, after a lecture at Freiburg University, vaguely remembered a scene with a tiger. Some admitted defeat. Most, I suspect, will have done what for me has become a sobering habit: inspect the shelves, pick a book at random, blow off the dust, see what memories it fails to bring back.

I must add that it wasn't Musil's fault nor mine, nor anyone else's; Roland Barthes was right. The point of reading a novel, I have since come to appreciate, is not to assign it to declarative memory, which would allow us to re-member, or re-assemble, its content or form. I encountered numerous false endings, lost passages, and disappointments when discovering that some authors and books, once my clear favorites, hadn't aged particularly well. Let's be polite enough not to name them here. Others are still great, and some (quite a few) will never disappoint. Personal preferences aside, when reflecting on memory, comparing shelf books and mind books is about as efficient as ancient methods of celestial navigation. Nowhere near as precise as GPS or radar, they nevertheless allowed experienced sailors to expand the boundaries of the known world. Nautical charts, compasses, or sextants are aided by the stars; libraries of the mind illuminate that no-man's-land between brain and self where neurologists fear to tread.

We're all imaginary librarians now

Unlike a public library the library of the mind is not a *place*, real or metaphorical, but an activity following as yet unknown and unknowable, but imaginable rules and regularities. One day a fully-fledged neurology of reading may discover and chart the brain areas and connective networks actively engaged in storing and retrieving reading experiences, revealing one of the last mysteries of the brain-mind paradox (the soul remains the ultimate goal). Until then we best consider the mind's library as a set of processes and procedures whose nature can be intimated using the analogy of a public library where librarians work to expand, organize, and provide access to book collections. The mind's imaginary librarian performs similar tasks but in very different ways, and to very different ends: the mind's I-library hosts treasures which can't be shared but feed that elusive phenomenon philosophers call the self.

Public libraries expand their collections through different channels of acquisition, including purchase, exchange, gift, donation, bequest and legal deposit. Once new material has been obtained, it needs to be processed. In lending libraries this includes using stamps to indicate ownership or, more recently, tagging books with barcodes and library codes. The process of integration into the library management system also entails various forms of categorization using a mix of different classification systems, among them generic distinctions, chronological and alphabetical order, recent acquisitions and old stock, more and less frequently requested material. Depending on the type of book, a novel may be put on display or be banished to the mysterious vaults known as the 'archives.'

The library of the mind is a resource which issues no reader passes. Access is more restricted than to even the most securely guarded book collections. Established by you, and for your own use only, over a lifetime of reading, it is closed to everyone else. You couldn't share your mind's books, even if you wanted to. Strictly private, highly individual and not inheritable, the library of the mind relies on the senses for adding new stuff to its collections, and it uses these resources very creatively. Like the public library, it acquires new material through a variety of visual, auditory, haptic and other channels. Methods for collection development include, first and foremost, reading, but also listening (to someone else reading a story to us, either live or on an audio book), and – strange, but true – simply being in the world as a reader, always looking forward to reading the next enlightening book. Come to think of it, it makes a lot of sense to define a reader not as somebody who has read a lot, or is currently reading something, but someone who *will* read; being a reader is a lifestyle, a choice, an attitude.[6]

Being in the world as a reader means scanning book reviews, taking note of long lists, preferring to have your latte in a book shop, buying more than you will ever read because simply touching the book, which is a way of acknowledging its existence, satisfies the acquisitive instincts of every librarian. What is the difference between a cake and a book? You can have a novel and leave it, and still claim partial mental ownership. To casual readers who only pick up a

novel at airports to pass the time, this may sound strange; but regulars employing a staff of imaginary librarians enjoy a feeling of privileged access to an imaginary world once they lay their hands on the physical object. It's hard to deny that there is an element of self-delusion involved; but just as it is amazingly difficult for a busy mind to think only one meaningful thought at a time, it is quite a challenge for a reader to only buy or borrow what you will read next. Moriko Shoten's minimalist one-room bookshop in Tokyo featuring one book per week recently attracted quite a bit of media attention; a valid attempt to counter the information overload in an attention economy. Still, this one-book-at-a-time philosophy probably appeals more to interior designers than true addicts.

The library analogy provides useful hints as to how book processing in the brain may – or may not – work. Every new book passes from acquisition to cataloging and classification, or knowledge organization, the task of specialized catalog librarians. Standard library classification systems fulfill two distinct functions: they provide information about the location (i.e. where a book is shelved) and facilitate access to materials. Physical objects can only be stored in one place, hence the need for a notation system which assigns every book a unique number. In order to facilitate access, however, one should be able to find objects through more than one approach, e.g. subject and author. For this reason, classified catalogs assign several entries to objects. Once a book has been classified, categorized, and tagged, it is shelved and left to rest in peace, until some future reader asks for it.

Or a librarian decides that it's not a keeper. Public libraries cannot afford unlimited growth. Even though printed work has no expiration date and shelf life is hence potentially unlimited, provided acid and fire can be kept at bay, the quality of a collection depends on maintenance and development. This means that librarians may have to remove books from shelves, in accordance with collection development policies, in a process known as weeding. Weeding is a continuous, ongoing process which includes defining and revising criteria for weeding, identifying books which are damaged, obsolete, or no longer needed, and the removal of objects which no longer meet the required standards. Damaged stock may be replaced; other books will have to leave forever.

While professional librarians are educated and trained according to certain standards, the imaginary librarians at work in readers' minds reflect, and contribute to, our individual personalities, preconceptions and preferences. The acquisition and archiving of books in the mind follows no universal standards and rules, and not every reader owning a collection of books will consciously curate a virtual library consisting of recollections of reading experiences. Having said this, most readers will probably develop and use some sort of classification system when choosing, processing and remembering books. Favorite genres, authors, periods, style, or subjects will be as important as functional aspects like the educational value of reading or reading for fun. Picking your next novel rarely happens completely at random, even if we are not fully aware of our own selection criteria and the power of contextual framing.

What else could this entail? While casual readers tend to categorize literature according to favorite genres and authors, effectively defining their literary comfort zones, advanced collectors will develop more sophisticated mnemonic aids. They may remember where they bought a specific novel and how much they paid for it (especially if it was at a special place or a true bargain) as well as other pragmatic facts (e.g. recommendations or obligatory reading on the syllabus). What all these contextual aspects of book acquisition have in common is that they bestow a high degree of experiential relevance or significance on the reading experience: the joy of discovering a new book shop or getting a discount, feeling impressed by how precisely someone guessed our literary taste when selecting a gift (or disappointed when being misjudged), the pressure on literature students to finish course work in time, or reading something precious to somebody even more precious. Experience is thus invested with an emotional quality, and the more that specific experience meant to us at the time, the more likely it is that we will remember the book via that context.

To read a novel means to acquire it for one's mental library. After reading, our librarians take over. Their classification systems will be quite sophisticated. Consider how we treat poetry and fiction. The former is designed to be memorized, or at least lends itself to learning by heart – rhyme schemes, meters and patterns are not just proof of a poet's ingenuity, but extremely effective memory aids. Though schools no longer promote this way of mental tagging and cataloging, many people will be able to quote a few lines of poetry even today. But I have yet to find someone who tried and managed to learn a story by heart, in order to repeat it word for word. Not even the best contemporary writers would be able, or indeed willing, to memorize their novels. Length is not the issue here – ask any writer to quote, from memory, the first page or even the first paragraph of their work. Most will have to pass on this one. They might, however, happily remember the first sentences not just of their own novels, but also those of their favorite authors. Why is that?

First sentences, whatever the reason, seem to enjoy a special status among contemporary readers. It is a truth universally acknowledged that creative writing courses insist students put a lot of emphasis on this, and most can quote a few. In this respect, we treat them like poems. We often commit poems (including the lyrics of our favorite songs) to semantic memory, where our brain stores facts and events, so we can retrieve them if needed. Unlike the ancient bards of oral cultures, who remembered and recalled entire histories in the forms of myths and epic poems, we allocate valuable space in semantic memory to literature only if it serves a purpose. Today, the purposes of learning literature by heart are quite profane in comparison; semantic recall serves either pleasure (song lyrics) or self-fashioning: Declarative knowledge has its uses when it comes to identifying as an educated person. Mention Hamlet and the chances are that people will be prompted to continue: "To be, or not to be." No more, no less.

So, poems and Hamlet may be remembered: in eternal lines to time they grow. What about the rest of our readerly endeavors? Our two libraries may feel like one but they couldn't be more different. One stays the same and may easily

be passed on to subsequent generations, the other not only changes all the time, but also exhibits a high degree of idiosyncrasy and interpersonal variability: The ways we remember depend less on the book itself than on our cognitive architecture, processing power and allocation of resources. The few existing empirical studies of reading and memory point out that forgetting begins right away. Many details have been lost before you've even turned the page. By the time you've reached the end of a novel, half of it is already gone. Now imagine what you will be able to retrieve in ten years' time . . . The mind's librarians are, then, not hoarders, but excellent weeders.

The mind's architexture: Can books produce proteins?

While the shelf book has a wholesale price and resale value, appreciating mind-books follows a different logic; the measure is not value for money, but experience for time. Reading leaves us proud or relieved, if we can cross another classic from our ever-expanding reading list; satisfied, if we enjoyed the journey through unknown storyworlds; or disappointed. Some critics, like Tim Parks, recommend skipping the last fifty pages of a novel.[7] Others may be haunted forever by unfinished business. Novels are food for thought whose true nutrition value will only reveal itself in the future. Or not at all.

At this point in our argument we can slowly move from exploring the mind's library via analogies between the work of real and virtual librarians to programmatic speculation grounded in existing knowledge about contextual framing, text types and genres, forms and functions of narrative, as well as the structures and functions of the brain. Although neither literary theory nor neuroscience has thus far dealt extensively with the long-term effects of reading, both provide valuable insights into knowledge generation and input processing (or learning) which shine a light on what I would like to call the mind's "architexture."

Architexture acknowledges but deviates from the work of Gérard Genette who introduced the term architext to literary theory in order to describe the totality of general categories used to classify literary texts.[8] Genette's "architext" designates, with subtle irony, a specific type of transtextuality. Architexture, by contrast, is a post-textual notion, a fuzzy concept designed to provide substance to the mind's library, and to transform a phenomenological description into a cognitivist research agenda which may be derived from the *Kopfbibliotheken* analogy. Architexture, that curious hybrid of text, texture, and architecture, blends the haptic with the conceptual, shamelessly reducing and materializing what may, in the end, turn out to be a shelf made of proteins; a shelf that contains, but fails to keep in line, neuronal networks feeding on memories of words.

Like metaphorical descriptions of the neocortex as "a patchwork quilt, with many structurally distinct areas stitched together,"[9] archi-*texture* emphasizes the material or, at least, tangible foundations of the brain's work which allow the mind's potential to flourish, and avoids agency in favor of structure without

denying the possibility of an architect. Dissolving text in texture, moreover, architexture also signals anti-structure or post-structure, allowing further conceptualization of the liquefaction of print along the lines of the opposed poles of form and function, norm and deviation, design and use, or statics and dynamics. The term thus lends itself to describe, or rather suggest, not an orderly system of categories but a bewildering variety of preferences, features and qualities which characterize the acquisitions and collections of a reader's mind: a library in flux.

Architexture, a hypothetical network of interconnected processes involved in recalling reading experiences, has at least two related dimensions.[10] On the one hand, it refers to the multi-stage, non-linear sequence of mental states subsequent to what psychologists call text comprehension. This transformation of a reading experience into a memorable and forgettable past can only be studied within the wider context of memory research in the neurosciences.[11] On the other hand, architexture may be thought of as some sort of neuronal structure, prepared by prior reading, into which new memories are now embedded, and which in turn is stimulated by every new arrival in ways which may not be fully predictable – the domain of creativity research. But why *archi*-texture? Because Greek prefixes abound in neuroscience. *Archi* means chief, the most important thing, and text turned texture is what keeps readers going. In other words: texture, to readers, is equivalent to an athlete's or musician's muscle memory.

Like all memories which, thanks to a phenomenon called synaptic plasticity, physically transform the brain's neural networks, the process of book appreciation and storyworld appraisal must leave traces in the brain, although forensic neuroscience still needs to find and interpret them. We now know that the generation of new neurons (neurogenesis) is not restricted to early brain development – the adult hippocampus, a structure important for learning and memory, produces new neurons across its life span: "Your hippocampus," one textbook holds, "is not the same hippocampus you had a year ago."[12] If rats can develop new hippocampal neurons when exposed to an enriched environment (toys and playmates), leading to enhanced performance on memory tasks involving the hippocampus, and adult canaries can train brain areas associated with song performance, why should avid readers not become more reliable librarians? Practice makes perfect. Can't we diminish the difference between shelf books and mind books?

This kind of question somewhat misses the point. As we'll see below, our capacity for remembering and reproducing text depends on the perceived relevance of the task, which in turn varies according to context and genre. Reading fiction involves making aesthetic experiences which offer inspirational insights, facilitate perspective changes and trigger wild thinking; they do *not* cue the reader to collect and store data contained in the text. If information retrieval is not the primary goal, however, psychological tests of declarative memory can only be of limited use for understanding the mind's architexture. They can evaluate our capacity to recall poems learnt by heart, but are quite irrelevant when it comes to the mind's appraisal of narrative.

Despite significant advances in the last two decades, memory research is still a long way from fully understanding the implications of functional neuroimaging evidence and its significance for multiple memory systems and processing modes.[13] We don't even have a consistent theory as to how reading experiences are processed in the brain, and it is more likely that such a theory will be deduced from a phenomenological approach to reading than from neuroimaging and memory systems theory. Let's try, then, with the innocent incompetence of the amateur librarian, to translate the initial question raised in this essay's title, what happens *after* reading, into the language of neuroscience, if only for the sake of vertical integration and the amusement of the expert reader.

Although the neurobiology of memory is still in its infancy, relying to a large degree on invertebrates of all sorts – lobsters, crayfish, cockroaches, flies, bees, leeches, worms and snails, whose small nervous systems, simple genetics, and known and reproducible connections between large neurons facilitate experimental research – important advances have been made in understanding where and how in the brain different types of information are stored.[14] The physical basis of memories are changes in the electrical activity of the brain followed by subtle alterations or modifications in synapses by which sensory experiences are encoded in a process called memory acquisition. These modifications are distributed widely in the brain and are often too small to be observed – hence the significance of invertebrate research. In a second step called 'memory consolidation,' temporary synaptic changes are made permanent, committing short-term memories to long-term memory.

The synapse is an important, though possibly not the only, site of information storage in the brain. Modifications of neurons in working memory are transient – they allow us to remember things for minutes or even hours with no conscious effort and do not require any lasting physical change in the brain.[15] Only a fraction of our daily experiences, temporarily encoded in short-term memory, is committed to long-term memory, allowing Mark Bear, Barry Connors and Michael A. Paradiso to conclude, with ironic reference to the United States' Declaration of Independence, that "not all memories are created equal."[16] The brain uses additional mechanisms to retain certain experiences longer than others. While memory acquisition "occurs by modifying synaptic transmission between neurons […], synaptic consolidation requires, in addition, new gene expression and protein synthesis."[17]

Zooming in on the neuronal level like this is quite amazing, even though one should not forget that animals like macaque monkeys suffer whenever neurobiologists wish to observe the birth of a visual memory trace (receiving training to discriminate objects and food rewards is the fun part, but then lesions in the inferotemporal cortex are made to confirm that engrams relying solely on visual information are stored in the visual cortex). As reading experiences are likely more complex than a simple visual stimulus, probably involving more than the one sensory modality which allows monkeys to recognize familiar individuals (without being able to infer that the hand that feeds will eventually be the one that cuts), it will be some time before fuzzy concepts like imaginary libraries and

architextural minds can be made redundant by a list of mind book proteins and corresponding synaptic wiring diagrams. Having said this, it is intriguing to assume, with Eric Kandel, whose experiments found evidence of synaptic modifications in a marine snail called Aplysia, that evolutionary principles apply to memory: "I found, much as Charles Darwin might have predicted, that once nature finds a solution that works, it tends to hold on to it. In other words, the same general principles that govern short- and long-term memory storage in simple animals also apply to complex ones."[18] How complex are readers?

Among the problems waiting to be solved by future generations of neuroscientists is not only the location of memory, but also the exact nature of the kinds of knowledge and learning involved in memory formation. Most experimental research on structural plasticity and the lasting imprint of new protein synthesis relies on learning through conditioning: avoid pain, get a reward. Even fruit flies can learn to avoid certain areas and fly away if particular odors are associated with electric shocks.[19] The learning tasks and memories involved are quite simple, and established frameworks like the distinction between declarative and non-declarative memory fail to capture the holistic nature of human encounters with art and aesthetics. Few would deny that good fiction shines a light on human nature, yet all we know with some degree of empirical certainty is how readers memorize a short and simple nursery rhyme.

Poets have always used organizational devices like meter, rhyme and stanzas for aesthetic reasons. In classical subgenres like the sonnet, the regularity of linguistic patterns not only reflects aesthetic preferences; historically, it also served as a mnemonic aid to facilitate the reproduction of linguistic structure: In former times, poetry was designed to be performed, like the lyrics of contemporary music. Being able to recite a sonnet from memory does not necessarily mean that you have understood its meaning – learning by heart is not a form of interpretation. The poem is treated like a piece of factual information which needs to be committed to declarative memory, the area of the brain where factual knowledge resides. Seen this way, poetry is the reference section in a public library that is otherwise best imagined as a post-deictic, non-locational or trans-spatial archive to which unauthorized entry is strictly forbidden. Learning a poem means treating the text like names or dates or mathematical formulas; often a little hint will get you going if you're stuck. Words, syntax and sequence can easily be stored in long-term memory.

Literary scholars may object that treating a poem like factual knowledge is not doing justice to its raison d'être, and of course I agree. The point is, it can be done. Young readers can memorize astonishingly long texts. In 2014, in a quiz competition on German TV, a 14-year-old student beat a well-known literary critic who certainly knew his Goethe inside out, by reciting *Faust* from memory, the complete play. But how many readers will be able to memorize a full novel by Charles Dickens, Salman Rushdie or Jonathan Franzen? Why should they even try? The point is that declarative knowledge of facts (semantic memory) and autobiographical life experiences (episodic memory) is only one of several memory systems distinguished by neuroscientists. Non-declarative

memories include procedural memories of skills and habits as well as emotional memories stored, they say, in the Amygdala.

The tree diagrams routinely used to represent types of knowledge and memories in neuroscientific handbooks are extremely reductive, and necessarily so: A clear demarcation of types of knowledge and memory is difficult to achieve in theory and probably impossible to observe in practice. Computer simulations are a promising alternative to experimental research in many fields of neuroscience; defining knowledge and memory, however, is not a neurological but a philosophical problem. Chances are that if neuroscience accidentally discovered the self or consciousness, it wouldn't recognize it as what it is.

If treating a novel as factual knowledge and committing it to declarative memory means missing the point of fiction, what else is the point? The answer, aesthetic experience, is not very satisfying from a scientific perspective, as it resists classification. Being immersed in fictional worlds, readers activate all sorts of knowledge and memory systems, most of them short-term, some meant to last. Most likely, though, what we remember is not the narrative design of a novel, its structure, form, or style (unless these are explicitly foregrounded), or even the content, which can be captured in a plot summary, but first and foremost the reading experience itself. We will retain fond memories of a novel long after we have forgotten all the details, the 'existents' (as narratologists call the nitty-gritty of storytelling): characters, names, settings, events.

Some readers do treat novels as factual information, of course: You can learn the spells with Harry Potter or discover middle earth with Frodo. Get it wrong, and someone will put you right. But outside the world of fandom, memory tests will yield neither spectacular results, nor particularly relevant insights. We might never be able to figure out what happened to the reading experience we are no longer able to fully recall or even to repeat by re-reading, as all experience is tied to a specific moment in time. To complicate things even further, experience itself is as contested a concept as one could possibly imagine. In a wonderful collection of interviews with leading philosophers and neuroscientists, Susan Blackmore quotes, among others, John Searle ("brains *cause* experiences"), Paul Churchland ("experience just is a pattern of neural activation") and Kevin O'Regan ("experiences are not correlated with anything going on in the brain; rather they are what brains do").[20]

Speaking about reading experience is one thing, then; defining it another. Neuroscience has thus far failed to account for mnemonic variation and gradation in a systematic manner. Total recall or complete oblivion are two extreme ends of a broad spectrum of possibilities, and most phenomena we call reading memories are situated between these poles. For the time being, we have no way of knowing what role a reading experience has played in shaping our architexture, the specific profile of our own mental library. We can only speculate on its functions. Architexture, soil for the self, is the sum of our reading experiences and the knowledge derived from them, a cognitive template for worldview curation.

Graceful degradation: The liquefaction – and reduction – of narrative

Novels are written to be disremembered, misrecollected, and, eventually, forgotten. Unlike poems, you can't learn them by heart, and if you could, it would not be worth the effort. Unlike factual information, you can't look them up in a meaningful way. The name of a character, yes, but who would consult a literary dictionary to figure out what A said to B (in which chapter?), or how exactly the narrator allowed us access to C's thoughts, using internal or external focalization? With the exception of concordances to Shakespeare's works, such indices are not produced or used in the literary world (unlike theology, where words are taken for granted). Nobody wants to *know*. If you're interested, you'll have to read the whole thing again, most likely from the beginning: the novel is a concept album rather than a playlist.

Forgetting mental representations – a novel's storyworld – is a continuous process, due to a phenomenon which neuroscientists call "graceful degradation."[21] The metaphor which best captures the graceful degradation of narrative is liquefaction, the process in which transient memories dissolve an invariable, 'solid' text. Liquefaction, or 'melting the solids,' has been used to characterize "liquid modernity."[22] Zygmunt Bauman takes his inspiration from Marx and Engels who, in the manifesto of the Communist party, predicted the dissolution of the ruling class. Both uses of the concept or metaphor signify a world-in-flux, and the idea of the mind-in-flux complements this rather nicely.

Narrative is as fuzzy a concept as memory; most theorists will agree, however, that narrative fiction is best conceived of in terms of story and discourse, the what and how of recounting events for an audience. Traditionally, both authors and critics have considered story as discourse's poor relation, a necessary evil. E. M. Forster, in his seminal book *Aspects of the Novel*, describes story, "events arranged in their time sequence," as "the lowest and simplest of literary organisms": a wriggling tapeworm whose only merit is that of "making the audience want to know what happens next."[23] The "naked worm of time"[24] thus only serves an ancillary function, grabbing the reader's attention for a few minutes, allowing discourse to work its magic.

Like footprints in sand, blown over by the wind, the details of the story itself – who said what, exactly, when, where, to whom – get lost very quickly. Remembering the precise sequence of events is less important than recalling the events themselves, and even they will fade away, once they have done their duty, i.e. to escalate a conflict, portray a character through his or her behavior, or carry a semantic function: In Forster's famous novel *A Passage to India*, the Marabar Caves signify the unknown or unknowable, cultural otherness. How the characters got there (by car), who else took part in the expedition with Dr. Aziz and Miss Quested, the protagonists, what happened before the trip to the caves: all this is important *while* reading and irrelevant *after* reading, all this is story.

Cooking provides another metaphor, one that makes the fading of narrative more tangible. Imagine reducing a sauce, gravy or broth. You start with a big pot, filled to the brim with fat, bones, meat, vegetables, wine or beer, and, of course, water. With the help of energy and time, you heat it, let it boil for a short while, then simmer, stirring it occasionally. At some point, the solids have to go, so you take out the fully cooked pieces of beef, chicken, or fish. Another round of cooking will allow more liquid to evaporate, condensing the sauce even further. As time passes and the sauce thickens, it also reduces in volume; and when the cook is happy with the consistency, the results may be served or processed further, either by deep-freezing for later use or by blending with further ingredients.

While some aspects of narrative design evaporate more quickly than others, a few will hopefully survive the reduction process, adding a new flavor to the existing architexture. As we've seen, this is not always the case; my original Musil evaporated fully without leaving a trace. An untrained palate won't be able to match the taste of the gourmet, and likewise a good novel may be read at the wrong time. Too young, too early, too eager I must have been to feel the devastating blow the description of Ulrich's friend Walter deals to aging hopefuls. Other books leave a strange taste. The only thing I remember of Stieg Larsson's crime novel *The Girl Who Kicked the Hornet's Nest*, apart from the fact that I, like millions of other readers, quite liked the quirky protagonist (whose name I have forgotten), is that the main characters kept drinking coffee all the time: 53 visits to the coffee machine are stored in my declarative memory (I counted them at the time). Other discourse producers won't go away, call them Ishmael, Rodion, Oskar or Humbert Humbert.

To be fair, Melville, Dostoevsky, Grass and Nabokov, to name but four of the great minds roaming my library, have been given a head-start in the narrative reduction game. As a student, I passed oral exams on their work and re-read them several times; meanwhile I have published on them or taught them in my own classes. Most importantly, perhaps, I devoured them at decisive stages of my own career as a cook-turned-librarian, reducing reading experiences to the inspirational ideas which only great art provides. The memories are not pure, but strange hybrids. While it is easy to distinguish *The Tin Drum*, the shelf book, from Volker Schlöndorff's excellent film adaptation, both have long since blended into one unforgettable experience. The library of the mind may be a bit picky where genre is concerned, but it tends to reduce transmedia storytelling to one coherent storyworld experience. Nor does it care for copyright: similar experiences are layered and morphed, favorite ones recycled and relived, until the sauce gets creamy. The mind's architexture, to round off this pageant of metaphors, is the gravies' gravy, a superb broth, result of a lifetime's reduction, so thick that a spoon will stand up in it.

Epilogue: Worldview curation

Is it true that cognitive activity leaves a physical trace in the brain, producing new proteins and establishing new connections between synapses, as current introductions to neuroscience claim? I have to take their word for it. Eleanor Maguire's studies on the effects of learning city maps on the hippocampi of London cab drivers and on the differences between cab drivers and bus drivers suggest new directions for memory research: why not compare gray matter volume in hippocampi of readers and non-readers?[25]

As a literary scholar I have no way of telling whether this is possible, and I hesitate to share the somewhat contagious excitement with which some of my fellow inquirers into reading and the workings of the mind embrace brain research. I have spent sufficient time with handbooks and introductions to conclude that, for the time being, neuroscience can't explain what happens after reading, or why reading matters. What is more, I don't think that for the foreseeable future brain researchers will happily abandon rats for readers. The reductionist agenda of neuroscience and the pathological bias of memory research, however unavoidable, mean that phenomenological and experiential accounts of reading must play an important role in understanding the nexus of long-term memory, literature, and the mind. In particular, comparing our reading memories might yield interesting results, revealing recurrent features or idiosyncratic patterns: how individual are libraries of the mind really?

After reducing narrative to architexture, it is now, finally, time to increase complexity by considering the societal and cultural functions of libraries. Apart from a few national libraries which collect every book in print, providing a complete record of a society's knowledge production, public libraries have to set priorities. Their acquisition policies reflect their dual role as providers and curators of knowledge. Content curation, one of the most demanding tasks of librarians, includes sourcing, filtering, categorizing and presenting information. In a digital culture, librarians increasingly reinterpret their role as that of knowledge flow facilitators.[26]

Whatever architexture *is*, if it exists in a material state at all, we all know how it *feels* and what it *does*. It guides us through book-shops, helping us readers to pick and choose where others need assistance. It steers us away from the business pages in newspapers to the feature section, expresses a preference for art-house cinema and helps us come to terms with the world. In this sense, the imaginary librarians reducing Forster's diffident tapeworms to deliciously creamy sauces are experts in worldview curation, shaping preferences and predilections. Like all complex dimensions of memory, *Kopfbibliotheken* are not designed for simple recall tasks but create templates for behavior and help us reflect who we could be, who we should be, and who we are. No wonder, then, that the gaze of Ugolino Martelli is hard to read. Exhausted? Enlightened? Tired? Inspired? Maybe he is just confused.

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This essay combines a phenomenological account of one reader's memories with a playful exploration of the wider conceptual potential of metaphors and images, new and old. I can't name all the books and people which have informed my approach to libraries, real and virtual, and the architexture of the readerly mind; but I would like to thank James Phelan and Peter Rabinowitz for their inspirational work on the framing of reading experiences and the relationships between textual and readerly dynamics; Marisa Bortolussi and Peter Dixon, with whom I had the pleasure of co-editing a special issue of *DIEGESIS* ("Empirical Approaches to Narrative") in 2016, for their exciting psycho-narratological project which looks at the nexus of narrative and memory from an experimental angle; Dorothee Birke, whose work on representations of readers and reading in narrative fiction points to the symbiotic relationship of reading and writing; and, last, but not least, Astrid Erll, my sometime partner in crime, whose work has taught me more about memory than even I have managed to forget.

[1] Mieke Bal (2002): *Travelling Concepts in the Humanities. A Rough Guide*. Toronto, ON et al.

[2] Roland Barthes (1974): *S/Z. An Essay*. Trans. by Richard Miller. New York, NY.

[3] This, in turn, inspires curators and art historians; cf., for instance, Cathrin Klingsöhr-Leroy (2018): *Lektüre. Bilder vom Lesen – Vom Lesen der Bilder*. Kochel am See; or David Trigg (2018): *Reading Art. Art for Book Lovers*. London.

[4] The picture is taken from https://de.m.wikipedia.org/wiki/Datei:Angelo_Bronzino_-_portrait_of_Ugolino_Martelli_-_WGA3264.jpg (13.06.2020), where it was published under the Creative Commons CC0 1.0 Universal (CC0 1.0) Public Domain Dedication License.

[5] Karl Marx / Friedrich Engels (2004 [1848]): *Manifesto of the Communist Party*. Marxist Internet Archive (2010). URL: https://www.marxists.org/archive/marx/works/1848/communist-manifesto/ (13.06.2020), §I: "Bourgeois and Proletarians."
[6] Cf. also Heinz Schlaffer (1999): "Der Umgang mit der Literatur. Diesseits und jenseits der Lektüre." In: *Poetica* 31 (No. 1/2), pp. 1-25, here p. 2.
[7] Cf. Tim Parks (2014): *Where I'm Reading From*. London, pp. 15-19.
[8] Gérard Genette (1992): *The Architext. An Introduction*. Trans. by Jane E. Lewin. Berkeley, CA et al.
[9] Mark Bear et al. (2016): *Neuroscience. Exploring the Brain*. Philadelphia, PA et al., p. 791.
[10] I say at least two dimensions, because reflections on the architexture of the mind's libraries also bring back memories of a concept which was *en vogue* in the 1980s, travelling from cognitive biology to systems theory and constructivist philosophy: *autopoiesis*, the notion of a self-contained, self-referential system.
[11] The following comments on memory and the brain are based on Bear et al. (see endnote 9).
[12] Ibid., p. 787.
[13] Roberto Cabeza / Morris Moscovitch (2013): "Memory Systems, Processing Modes, and Components. Functional Neuroimaging Evidence." In: *Perspectives on Psychological Science* 8 (No. 1), pp. 49-55.
[14] Cf. Bear et al. (endnote 9), pp. 866f.
[15] Cf. ibid., p. 867.
[16] Ibid., p. 867.
[17] Ibid., p. 867.
[18] Qtd. in ibid., p. 873.
[19] Ibid., p. 888.
[20] Susan Blackmore (2006): *Conversations on Consciousness. What the Best Minds Think about the Brain, Free Will, and What It Means to Be Human*. Oxford, p. 4; italics in the original.
[21] Bear et al. (endnote 9), p. 870.
[22] Zygmunt Bauman (2000): *Liquid Modernity*. Cambridge et al., pp. 3f.
[23] E. M. Forster (1985 [1927]): *Aspects of the Novel*. Orlando, FL et al., pp. 27f.
[24] Ibid., p. 28.
[25] Cf. Eleanor A. Maguire et al. (2000): "Navigation-related Structural Change in the Hippocampi of Taxi Drivers." In: *PNAS. Proceedings of the National Academy of Sciences of the United States of America* 97 (No. 8), pp. 4398-4403; and Eleanor A. Maguire et al. (2006): "London Taxi Drivers and Bus Drivers. A Structural MRI and Neuropsychological Analysis" In: *Hippocampus* 16 (No. 12), pp. 1091-1101.
[26] Clare Brown reflects on this development, cf. "The Evolution of Content Curation. A Librarian's Guide." Vable (March 23, 2020), URL: https://www.vable.com/blog/the-evolution-of-content-curation-a-librarians-guide (13.06.2020). The wider societal implications of curation are the subject of Michael Bhaskar's book *Curation. The Power of Selection in a World of Excess* (London, 2017).