Where's Walden?: Searching, Googling, Reading, and Living in the Digital Age

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Abstract. Searching has a history. In this paper I analyze that history by dividing search into two methods: indexing and reading.

Most discussions of search history are limited to search engines. Analyzed in indexing terms, however, the history of informational search reaches back to the proliferation of print, and beyond. By placing search engines into indexing history, I seek to understand how this new technology (like other information technologies before it) mirrors, and is changing, the human brain. Additionally, I look at the problem of too much information by discussing the solutions proposed by three indexing visionaries (Henry B. Wheatley, Vannevar Bush, and John Battelle) alongside recent studies about digital search habits.

The second half of the paper describes reading as a means of searching for meaning through critical thought. As with indexing, I explore the origins of reading to show the complexity of the human brain, and how reading fluency can shape the brain. I also juxtapose descriptions of reading (offered from the humanities, hard sciences, and social sciences) beside current reading studies performed by the National Endowment for the Arts.

By unifying the histories of indexing and reading, I argue that prominent search methods influence the value that we give to different types of knowledge and shape the way that we think. I suggest that modern searchers must become fluent in both reading and digital search in order to locate relevant information and be able to critically evaluate that information.

Keywords: history of indexing, history of reading, information studies, online searching, Google, literacy, reading

Henry David Thoreau went to Walden because he famously "wished to live deliberately, to front only the essential facts of life, and see if [he] could not learn what it had to teach, and not, when [he] came to die, discover that [he] had not lived." (Thoreau, 59) In other words, Thoreau went searching. A large part of what he found can be read in two places: his book *Walden*, and his six-year personal index of observations around the pond. His index catalogues over 400 plant species and is complete enough to have been recently used in a study about climate change. Thoreau's *Walden*, however, makes the pond out to be more than a small Massachusetts ecosystem; it was a representation of Nature and Life—a microcosm of the world itself. As such, it was not just an escape from civilization; for Thoreau, Walden was the perfect search environment: it was his place in the world to collect data, digest it, and connect it to his life. But Thoreau's writings about Walden are also a part of a different world: the world of information.

The difference between the physical and the informational world is that the former is made of atoms and molecules, the latter of symbols and words. Even before the digital age, the world of information was unimaginably large, contained in libraries, books, and art. In our time, however, electronic impulses, the internet, and iphones have not only made it exponentially larger, but are making it grow at an unimaginable rate. The challenge of modern search is to extract the knowledge we need from this information infinity. To accomplish this difficult task, searchers must find a place to start, a perfect search environment; but where is it? Where's Walden?

The word 'search' has one basic meaning: "to explore in quest of some object." According to the *Oxford English Dictionary* (OED), this usage has been fairly consistent since 1330. Search *methods*, however, have shifted over time. A newer verb illustrates one such shift. First used in 1999, the OED defines the term 'google' with these words: "To search for information about (a person or thing) using the Google search engine." To google, then, is also to search; but it is a specific kind of search. Though the word itself emphasizes the latter half of the definition, the first phrase is more revealing: to google is "to search *for information*." In other words, using a search engine emphasizes finding information: concrete, precise, definable.

Information, however, is not the only thing that we search for. The object of a search may also be meaning or understanding. In this context, reading itself is a search method. This 'deep reading' (as I will call it) requires more than the decoding of information; it includes our response to what we read, and enables us to understand everything from a simple plot to the connections between narratives, concepts, and life. The broad definition of reading demonstrates its importance—to read is "to consider, interpret, discern" (OED). Where googling emphasizes information, reading emphasizes thought.

As we have adjusted to the rapid growth of information, both of these search types—informational and meaningful—have had to accommodate to our new digital lifestyle. These adjustments have altered our perception of knowledge and even developed a new literacy. Indeed, these changes demonstrate that how we search has a profound effect on what we search for, what we find, what we know (or think we know), and even the physical wiring of our brains. Finding Walden in our time means understanding this new search reality; but in order to understand we must first explore its origins.

Searching as Googling

The history of googling is a history of prophecy. To trace this history, therefore, we must also leap into the future: three futures in particular, envisioned by three men. All three of these men were responding to the same problem: too much information. As if each were inventing a more powerful microscope, their visions progressively advocated new ways of seeing knowledge on a smaller and more isolated scale. A brief look at these visions can help us to see how modern search technology is (1) transforming the way that we organize information, (2) developing a new understanding of knowledge, and even (3) creating a new literacy.

The newness of Google may deceive us into thinking that the history of googling is less than a decade old. In truth, however, the promise of a universal search-engine dates back more than a century. In 1878, Henry B. Wheatley founded the Index Society in Great Britain. One purpose of the society was to create 'The General Index.' In order to build this index, Wheatley planned to rely on Index Society volunteers who would individually note subjects and pages in their personal reading, and then send their notes to a central organizing body. The central body of indexers would then organize those notes into a massive inter-book index — The General Index. In his announcement of the

plan, Wheatley accused the nay-sayers of lacking "sufficient faith in the simplicity and usefulness of the alphabet" (Wheatley, 40).

The General Index was not, however, an entirely novel concept. Wheatley frankly admitted that two others had already proposed a similar idea. Even if Wheatley had been the first, the idea was no immaculate conception; rather, it is the offspring of two organizational principles: one ancient and one modern. The ancient idea is cataloging by alphabetical subject; this was done first with books at Alexandria, where Ptolemy hoped to organize all books into a single catalogue. Eventually, alphabetical subject became the organizing principle of both book indexes and library catalogues. The second and more modern principle is cross-referencing — a kind of subject-based inter-book indexing. By combining these ideas, The General Index proposed to take a step beyond organizing all *books* into a single catalogue; it sought to organize the *pages* of books into a single overarching index. Needless to say, there was not enough faith in the alphabet to make it happen.

Our second indexing visionary, in fact, had no faith in the alphabet at all. At the close of WWII, Vannevar Bush wrote, "Our ineptitude in getting at the record is largely caused by the artificiality of systems of indexing." Alphabetical organization, he argued, hinders our ability because it is incompatible with how the brain works. The brain, he explained, "operates by association," and would be better equipped if the machines and structures it used to organize knowledge did the same. Therefore, changing the indexing system would increase the human capacity to find, store, and understand knowledge (Bush).

To accomplish this task, Bush proposed the creation of a machine called the memex, which bears resemblance to the modern computer, though it would rely on microfilm instead of microchips. Through the memex' keyboard, individual pages of microfilm could be marked and permanently linked together. At the push of a button (rather than scanning through an alphabetical listing), the user could associatively jump from any page of one book to any page of another book (Bush). Whereas Wheatley's vision had hoped to sift a supreme alphabetical index out of books, Bush wanted to sift index-subjects away from the alphabet — 'A' would become arbitrary.

Finally, our third visionary, John Battelle, begins *The Search* (2005) by explaining how digital search — the latest informational finding-aid—works. It uses three separate computer programs that (a) find webpages, (b) read & sort them, and then (c) connect them to the searcher's keywords (Battelle, 20). Battelle's vision of the "Perfect Search" is basically the perfection of all three of these programs. It would have access to all information everywhere; it would be able to rapidly read and organize every page on the internet with better-than-human understanding; and it would know us (the users) so well, that it would fully comprehend our needs and return our desired result without ever having to ask "did you mean. . .?" (Battelle, 280). All of this, he believes, will be accomplished through the clever application of algorithms. This kind of search, he says, will precisely answer all of our questions from *Where's my kid?* to *What is immortality?* (Battelle, 254). Anything less would be imperfect.

Battelle's vision completes a process that began with Wheatley: subject-headings themselves being replaced entirely by keyword-search terms. But this process documents more than the hopes of information indexing; it is a story about a fundamental change in how we have come to understand knowledge. Before indexes, library catalogues directed a searcher to entire *books*; The General Index sought to guide a searcher from alphabetic subject-heading to the *pages* in books; the memex hoped to de-alphabetize subject-headings and propel the searcher directly from associative-subject to *screen*-shot; and Battelle's Perfect Search dreams of divorcing subjects entirely from knowledge, so that search will simply and absolutely answer the user's exact query without any peripheral results. With each step, our perception of knowledge gets shredded

into smaller and smaller bits, until it can no longer be called knowledge, only information.

Interestingly, these visions also progressively place more and more responsibility on the technology, and less and less on the user; until the user is required to do nothing more than type recognizable letter combinations into a search box. So, how much closer has technology brought us toward solving the problem of too much information? According to one study, digital search formats can be so intricate that users "focus on navigating the complex system rather than deriving meaning at the word, sentence, or paragraph level" (Shapiro, 607). A second study concurs by describing a new kind of "horizontal reading" (UCL, 10), and adds that modern internet searchers have a "poor understanding of their information needs," have difficulty adjusting their language to fit the language of a search-engine, lack general understanding about search engines, and/or are unable to assess the results of their search queries (UCL, 12). Indeed, this second study gives the impression that internet searchers are more focused on getting information onto their screens than into their brains.

A third study underscores the findings of the first two by labeling this horizontal reading as part of the high-tech revolution's "state of *continuous partial attention*," whereby we are "keeping tabs on everything while never truly focusing on anything" (Small, 18). But more than simply contributing to a new cultural development, this last study explains that, because our brain is a malleable organ, frequent exposure to high technology "stimulates brain cell alteration," which literally rewires our mental neurological connections (Small, 1). In fact, this study shows that, compared with traditional reading, googling activates different areas in the brain (Small, 17). In short, it is a unique literacy, or a different skill. As such, the solution to our searching problems should not be sought by the invention of newer and better technologies (which will only require us to learn other literacies), but by encouraging and enabling users to actively develop this new skill. Deliberate ability — instead of technology alone — is the surest solution to the problem of too much information.

Political history has conditioned us to see the past as a story of successive replacement eras. In this case, however, our visionaries have also provided us with a history of options. Understanding these search options can improve our googling literacy. Just as different modern microscopes allow us to see different levels of matter — e.g. cells, molecules, and atoms — these visions describe a useful searching spectrum. On the one end, man-made library catalogues guide us to books and help us to recognize knowledge continuity in subject headings; and on the other end, digital googling enables us to browse through more content at higher speeds. In the middle, there are several searching options that combine varying levels of human understanding and digital capacity. Learning to move along this spectrum according to our needs, rather than simply trusting in almighty Google, is essential to becoming literate digital searchers—searchers who must also recognize the need to tame our technology, before our technology tames us.

Searching as Reading

As two related literacies, googling and deep reading are separate branches that both grow from our ability to decode words on a page. In fact, they each represent a specialization in one of the two capacities that make learning to decode possible: symbol recognition and association. Symbol recognition exploits our brain's ability to quickly remember the meaning of a symbol. In physical terms, learning to recognize the letters of the alphabet literally builds neuronal circuits in our brain that specialize in identifying written words. Association, on the other hand, attaches a word like "Fire!" to the feeling of danger. It exploits our brain's ability to make connections between language,

concepts, and life. Again, these connections establish physical wiring in our brain.

Once we have mastered the ability to decode, brain scans show that googling and deep reading stimulate different brain areas. When we google, we exercise our ability to rapidly recognize relevant information; when we deep read, we practice associating and linking that information to other pieces of information. The former may provide us with building materials; but the latter actually builds. More than building a network of meaningful information inside of our brain however, deep reading also constructs (1) an enhanced capacity for thinking, (2) our personal freedom of thought, and (3) more depth of meaning in our lives.

In *Proust and the Squid*, Maryanne Wolf describes the difference between decoding and deep reading: "Decoding does not mean comprehension" she explains. It may enable us to understand "the facts of the content," but deep reading gives us "an increased capacity to apply an understanding of the varied uses of words—irony, voice, metaphor, point of view [etc.]" (Wolf, 137). Learning to read on this deeper level rearranges "the very organization of our brain which in turn expand[s] the ways we are able to think" (Wolf, 3). Historically, Wolf demonstrates that this expanded thought capacity has "altered the intellectual evolution of our species" (Wolf, 3). At the close of her work, she warns that an over-dependence on modern technologies like digital search may mold us into "a society of decoders of information, whose false sense of knowing distracts them from a deeper development of their intellectual potential" (Wolf, 226). To summarize, building our ability to deep read enhances our ability to think.

As narrative-psychologist Richard Gerrig shows, deep reading involves more than improved thinking; it is also about freedom. Furthermore, his evidence expands our definition of deep reading to include any media used to tell any story or make any argument (Gerrig, 7). Through empirical testing, Gerrig demonstrates that when we comprehend a narrative or argument, our default reaction is to accept it as true. Disbelief is, in reality, something that must be constructed through critical thought. Sometimes it is easy to construct disbelief. Take, for example, this story: *Jim died because he took antibiotics*. To construct our disbelief we can simply tell ourselves that the story is false: *no he didn't*. But Gerrig's tests show that liberating our thoughts from fiction requires us to think and to read more deeply. Implications, he explains, can be more powerful than direct assertions. In fact, if we expose ourselves over and over again to stories about the 'dangers' of antibiotics (even stories we know to be fictional, like the one above), we will believe more and more strongly that antibiotics are, in reality, bad for us. We may even refuse to take them for entirely fictional reasons (Gerrig, 196-241).

But this principle affects more than just people who overexpose themselves to falsehoods — it is how advertising works. We see 'cool' people drinking Pepsi over and over again until we believe that it's actually a better product than Coke. More is at stake, however, than our taste in colas; lacking this ability to defend our thoughts from coercive and manipulative messages, the will of the people can quickly become the will of the wealthy, our perception of beauty could grow into a collective image of photo-shopped anorexia, and our own sense of self-worth might end up being determined by the cost of our clothing. Indeed, in our media-saturated society, deep reading must become more than a hobby; it is an essential intellectual survival skill. It is the path to becoming free thinkers — the way to decide what we want independently, and for ourselves.

Inasmuch as deep reading enables us to construct disbelief, it can also empower us to truly believe. From a humanities perspective, Sven Birkerts asks, "What do we do with the words when we read?" "We make the music indicated by the notes," he replies. "But even more than the musician following a score,

we invest ourselves in the act" (Birkerts, 113). This investment is unique to deep reading because it requires extra effort. Where partial attention may be enough to make us click on different links that display different images and words, when we deep-read we must *focus* our way into the author's narrative and concepts. This focus not only makes deep reading more difficult, but also makes the content more powerful in the life of the reader: more investment means more profit. When we connect with and understand characters through deep reading, we increase our capacity to connect with and understand others in our own lives. This connection to life is also introspective: discovering deep meaning and coherence in texts helps us to see the same in ourselves (Birkerts, 109-113). Deep reading begets meaningful belief from intense personal investment instead of simple and superficial exposure.

The common threads of these descriptions help us to better recognize the place of deep reading in modern search. Metaphorically speaking, if we are always looking through a microscope, we will never see the bigger picture. Deep reading is a literacy that enables us to understand information on a larger scale. By exercising our ability to create and recognize associations between bits of knowledge and information, we are enabled to see the ways that informational atoms and cells contribute to the function of larger conceptual organs, or even how conceptual organs cooperate to form coherent belief systems. Where the history of googling shows knowledge being broken into smaller and smaller bits, these descriptions of reading guide us toward rebuilding those bits into cohesive and intricate thoughts. This is the skill that Thoreau exercised when he shaped his observations of Walden Pond into a profound and personal poetic philosophy.

Searching as Living

So, 'Where *is* Walden?' we might ask. Where *is* that perfect search environment? Thoreau provides the answer: "We must learn to reawaken and keep ourselves awake," he says, "not by mechanical aids, but by an infinite expectation of the dawn" (Thoreau, 59). Finding Walden, in fact, is not about finding an environment at all. It comes from our own "infinite expectation of the dawn, which," he adds, "does not forsake us in our soundest sleep." Those who are able and motivated to gather information and think deeply about it have always had special access to Walden because they have learned to "keep [themselves] awake." Mechanical aids may increase our capacity and precision, new skills and literacies must be learned in order to cope with new technologies; but searching will always be ultimately rooted in a living desire to know. Walden was not the perfect search environment until Thoreau arrived to make it so. We will not find it online or in books; Walden must be lived. Thoreau's closing words contain the best set of directions: "Only that day dawns to which we are awake. There is more day to dawn. The sun is but a morning star" (Thoreau, 216).

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