THE FURY AND THE MIRE:

READERS, READING, AND OUR DIGITAL WORLD

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C O N T E N T S

A starlit or moonlit dome disdains

All that man is,

All mere complexities,

The fury and the mire of human veins.

— WILLIAM BUTLER YEATS, “Byzantium”

THE EMERGENCE OF THE MULTI-TEXTUAL READER:

AN INTRODUCTION

We live in a world saturated with information, and where access to digital media has never been more widespread. Sleek, fast, and user-friendly laptops, tablets, and smartphones appear everywhere in our society and make a nearly infinite host of text, audio, and video available nearly anytime and anywhere: people across the globe can communicate with each other and stay up-to-date on the news instantaneously; research in any discipline often takes seconds where it used to take weeks; and access to a vast array of human art and culture exists on a level unimaginable even less than a century ago. Furthermore, these changes and advancements have occurred at an exponential pace. The computing power people now carry in their pockets dwarfs the capacity an entire room of tangled wires and servers held fifty years ago. The advantages of these constantly improving intellectual technologies remain numerous and varied, but how have these rapid advancements over the last century affected the human capacity to read, write, and think? Despite all the amazing potential these technologies bring to humanity, they certainly do not come without a downside. Not only do these technological capacities create a multitude of new possibilities, but also like any impactful technology, digital media acts through us and changes the way we behave on a societal, individual, and even neurological level.

In a July 2008 article in the *Atlantic*, writer Nicholas Carr posed a simple, even counterintuitive, yet profound question: "Is Google making us stupid?" In his writing, Carr acknowledges the immeasurable benefits of digital media, particularly the Internet; his concerns lie in the inevitable tradeoffs these benefits bring. For everything that Google gives us, it has changed how we interact with text in a variety of ways. Carr is one of many current writers who

has argued that the Internet has deteriorated our capacity for sustained deep thought and reading; as people use digital media like the Internet to move instantaneously from link to link and from page to page, they lose their ability to do close readings of works of literature, history, philosophy, and even science. This inhibits their abilities to conduct the long-form close reading and writing that has represented the apex of academic prowess and superlative human thought for centuries.

The number of writers and thinkers who have weighed in on this current topic continues to increase as technology, research data, and scientific studies constantly alter the nature of this debate, as old theories are confirmed and debunked, and as new ideas come into being. In his 2011 essay, "The Information: How The Internet Gets Inside Us," *New Yorker* writer Adam Gopnik places the participants into three distinct camps that portray the state of literature and scholarship about this changing world: "the Never-Betters, the Better-Nevers, and the Ever-Wasers" (Gopnik). The so-called "Never-Betters" believe we are on the ascent to a golden age of technology, where freedom of information and communication will usher in a utopic world free of any discernible downside. The "Better-Nevers," on the other hand, lament that these shifts in the ways we read and connect with one another will limit the more erudite functions of the human mind, and that the kind of pensive thought stimulated by the ability to read texts like *Moby-Dick* or *The Brothers Karamazov* will never again be possible in a culture overrun with a flood of news bytes and 140-character tweets. Finally, Gopnik presents the so-called "Ever-Wasers," who maintain that all significant technological changes result in divisions like this, and that these debates are just as much a part of the change as the technology itself. While Gopnik designates the groups that surround this issue in a light-hearted manner, the role of literature in

the digital world (and vice versa) is worth exploring from a wide range of perspectives: popular, literary, and academic writers, alike.

One individual who does not fit easily into any of Gopnik's three categories is Duke University professor of literature, N. Katherine Hayles. A scholar who has worked at the intersection of literature and technology for decades, Hayles remains a leader in the discourse concerning the future of literature and the role of the digital humanities. In her 2012 book, *How We Think*, Hayles discusses these topics with a more academia-specific focus than either Carr or Gopnik; she includes discussion of how the Digital Humanities change academic research and scholarship as well as future possibilities for literature. For my purposes, Hayles' academic emphasis itself in a digital age is particularly valuable, as she (in a sense) attempts to bypass the division among Gopnik's three debating factions, and contends the kind of reading people conduct through digital media isn't usurping the types of deeper meditative reading, writing, and thinking that have been at the forefront of human thought and innovation for hundreds, if not thousands, of years. Rather, Hayles argues one can perceive these two types of reading as different modes of human thought entirely.

Hayles, in turn, cites Maryanne Wolf, the director of the Center for Reading and Language Research at Tufts University. Wolf concludes her 2007 work, *Proust and the Squid: The Story and Science of the Reading Brain*, with a call for the development of "bitextual, or multitextual" (Wolf 226) readers, those who can adjacently employ multiple styles of textual analysis across the entire media spectrum. In the chapter of *How We Think* titled "How We Read," Hayles draws a clear distinction between three types of reading: standard close reading; hyper reading or "computer-assisted human reading" (70); and "machine reading" (70), the kind of "human-assisted computer reading" (70) analysis conducted through databases and algorithms

that uncover patterns and data impossible just with human-centric forms of reading. Hayles concludes this chapter with a discussion of possible "synergies between close, hyper, and machine reading" (75). She remains optimistic that traditional forms of literary studies can coexist with their more recent counterparts, and open up a realm of entirely new possibilities for all types of people from students and academics to everyday readers, writers, and thinkers. In theory, this sounds like a utopic future of human knowledge, art, and culture.

But is the notion of a multi-textual reader who is able to access and then fully comprehend texts from a variety of sources and media origins a real possibility? The new forms of reading, thinking, and teaching that inevitably arise from digital media remain an enticing prospect, at least in theory. But has the advent of digital media made it irrevocably more difficult to partake in our accustomed forms of reading? Do the possibilities presented by these new ways of reading—hyper reading and machine reading—more than replace what we sacrifice in the process?

This thesis aims to explore these questions, which remain crucial to this moment in the study of literature. First, by examining how digital media changes the way we think deeply and read closely, it will examine and enter the discourse generated by writers like Carr, Hayles, and Wolf, utilizing a variety of examples and statistical evidence to discuss the way that the Internet changes the way we—on a cultural level—think and interact with one another. The way digital media affects us on a scientific level is equally fascinating and frightening; as we read articles or tweets online in place of focused reading free of distraction, our brains, as much scientific research has evidenced, become physically altered and rewired, which makes it physically more difficult to read closely and remember what we have read.

Second, this thesis will explore how computer-assisted human reading functions in the context of more traditional concepts of literature. If the theorists of linguistic systems like structuralism, post-structuralism, and semiotics have expanded the notion of texts and what they signify, and hypertext theorists like George Landow argue that "we must abandon conceptual systems founded on ideas of center, margin, hierarchy, and linearity and replace them by ones of multilinearity, nodes, links, and networks" (Landow 1), then how do more established concepts of "texts" – stories, novels, poems, etc. – function in this new environment? Are they new works in an entirely new medium or simply putting the theories of the philosophers and critics of the mid-to-late 20th century into practice? In this context, primary texts that seem to anticipate and even conform to rules of non-linearity set forth by hypertext and its theorists will be examined. Also, how does a text like Eliot's *The Waste Land*—a poem that, with its abundance of allusions and references, is very much an intertextual literary construct—function as a hypertext? Does the comparison of a linear print version of the poem and a non-linear hypertext version substantiate or refute the hopeful possibilities of "multitextual" readership?

Finally, this thesis will delve into the rapidly evolving field of human-assisted computer reading by discussing the relevance of quantitative analysis and computer-driven research to literary studies and the future of academia. I argue that this machine reading is an entirely different type of reading, one that both creates entirely new possibilities and drastically alters preexisting norms. The Digital Humanities encompasses an increasingly significant branch of innovative academic study, one that opens up a new field of large-scale collaborative projects. The Stanford Literary Lab, for instance, employs technologies typically reserved for the sciences to perform literary analyses, which gain new insights and ways of understanding entire bodies literature that before seemed entirely impossible. But there are tradeoffs with this technology;

corporations like Google exert a large amount of influence on academic study and research; as powerful search engines cut massive amounts of time and provide a nearly infinite amount of information, their algorithms have resulted in a world of homogeneous research and results, as a smaller range of sources continues to make up a larger majority of academic citations. Likewise, current research has explored the notion that the data collected by e-readers and tablets gives publishers and authors unprecedented access to readers' habits and preferences, which has the potential to stifle creativity in fiction as writers conform to the preferences of collective groups of readers. This mode of reading represents an emerging world where the possibilities are truly infinite.

Along with the multitude of possibilities these developments in intellectual technologies generate comes an array of problems, debates, and questions to be answered. The changes and increasing availability of digital media and their relevance to our society raises many questions. Reminiscent of the Hydra in Greek mythology, it seems for every question one answers, two more shoot up in its place. Never before in human history have technological changes occurred at such a rapid pace (and it is likely they will never again occur this slowly, as well) and thus understanding the influence of new media, as well as how it affects more traditional understandings of literature is absolutely crucial. As the interactions between close reading, hyper reading, and machine reading become more apparent (and the lines between continue to blur), we must establish an acute understanding of our relationship with these new types of reading. For as we alter the way we think about these technologies, they change the way we think as well.

FORGETTING HOW TO REMEMBER:

THE RELEVANCE OF CLOSE READING IN THE TWENTY-FIRST CENTURY

Our technologies actively shape how we interact with the world. The current, cultural shift from print to digital methods in the collection and dissemination of knowledge represents just one of many such modifications to human nature and the necessary capabilities of the human mind. Key today is the rapid pace of change, but similar fears about how the externalization of memory might affect the human mind have been around for a long time: in 370, B.C.E., as Socrates engaged in the dialectic inquires that would come to represent the foundations of Western philosophy and the humanities, his Athenian polis was shifting from an oral-based culture to a writing-based one. Unlike our rapid shift from a print to digital culture, for the Greeks this was a process that had already progressed for centuries. "Between 800 and 750 BCE the Greeks designed their alphabet and disseminated it to the Greek trading colonies," but writing had still not taken over the preexisting oral culture (Wolf 68). The slowness of this transformation was not just caused by the geographical and communicative impediments one would expect. Rather, many educated Greeks felt that their oral culture was superior.[1]

Socrates himself is the most famous dissident of this change that has now become ubiquitous. In the *Phaedrus,* Socrates intensely questions the merits of a written culture. He tells the story of the mythical god Theuth (the Egyptian equivalent to Hermes, the god of scribes and communication), who approached Thamous, the king of Egypt, and "showed him the branches of

[1] Classicist Barry Powell even argues that the Greek alphabet was invented specifically to record the renowned oral poetry of the *Iliad* and the *Odyssey*, and "from this momentous event came classical Greek civilization and its achievements" (237).

expertise he had invented," chief amongst which was writing (*Phaedrus* 78). Theuth tells Thamous that, "this invention is a potion for memory and intelligence" (*Phaedrus* 78). Thamous disagrees with Theuth's proclamation: "It will atrophy people's memories […] Your invention is a potion for jogging the memory, not for remembering" (*Phaedrus* 78). Socrates also contends that writing, like painting, is inferior to human speech and memory because it functions unidirectionally—it continually presents the reader with the same content, without the ability to elaborate on or discuss the ideas it contains. To Socrates, it is foolish to think "that written words could do more than jog the memory of someone who already knows the topic that has been written about" (*Phaedrus* 79). For him, writing is something that will "atrophy people's memories," "a mere image" of the actualized verbal speech that Socrates believes leads to an understanding of both abstract philosophical concepts and how they relate to the world around us.

It is one of the great ironies of the entire history of human thought, then, that the records of these foundational philosophies only exist today because Socrates' pupil, Plato, largely ignored his tutor's warnings on this particular subject. He even went as far as to declare that the Homeric tradition of poetry "deforms its audience's minds" (*Republic* 64). As Eric Havelock notes, this concern had a lot to do with *mimesis*: "dramatic 'imitation' or 'impersonation'" of human language that causes people to be unable to recognize the discrepancies between art and life (Havelock 21). Plato's discourse, however, also clearly suggests that the oral nature of Greek poetry threatened the pedagogical influence he hoped his writings would have: "the cultural situation described by Plato is one in which oral communication still dominates all the important relationships and valid transactions of life" (38). For a multitude of reasons, "the oral state of mind is still for Plato the enemy" (41). Just one generation removed from Socrates' insistence on

the worth of the oral communication, for Plato, preserved communication is far more important than a culture of memory and memorization.

Moonwalking with Einstein: The Art and Science of Remembering Everything, Joshua Foer's book on the history of memory and the memorization capabilities of the human mind, promotes the idea that this original insistence on the necessity of the written word was not to replace the human mind, but to aid it. "The brain is always making mistakes, forgetting, misremembering. Writing is how we overcome those essential biological constraints" (139). Foer contends, however, that the type of reading we conduct has shifted over time from "intensive to extensive" (147). Before the printing press, the small percentage of people who were literate and had access to books only had a few—the Bible, other religious texts, a few classical works, perhaps—and read them over and over again, using reading as a way to aid, rather than supplant human memory.

The printing press, however, replaced intensive reading with extensive reading. "In the first century after Gutenberg, the number of books in existence increased fourteenfold" (Foer 147). This period marked the beginnings of the shifts from the extreme close reading that occupies one end of our reading spectrum, to the superficial extensive reading that dominates our mindset today. We read more than ever before, but we do so quickly, and with few exceptions, we read things only once. Just at the moment when the printing press was beginning to cause this shift toward extensive reading and the externalization of memory, however, Foer contends that paradoxically, there was a renaissance of classical memory techniques and mnemonic devices most notably the common use of mental "memory palaces," three-dimensional spaces created in the mind to remember long strings of information that "were refined and codified in an extensive set of rules and instruction manuals by Romans like Cicero and Quintilian" (Foer 9-10). As

notions of reading changed throughout the world, its readers clearly desired to hold on to what they felt they were losing.

The rise of digital technology indicates both the existence of entirely new ways to interact with text and also a continuation of the shift in the types of reading begun with Gutenberg's printing press over five hundred years ago. "These technologies of storing information outside our minds have helped make our modern world possible, but they've also changed how we think and how we use our brains" (Foer 138). While it is easy to assume that printed books and how we read them have stayed constant for centuries, this is not the case. Bound codices supplanted scrolls in the third century for economic reasons: it was easier to utilize both sides of the parchment this way and save money, not necessarily because it was a more effective way to read. Medieval readers aided the reading process by placing spaces between words and the extinction of *scriptura continua* that was the norm beforehand. In a further break from the oral tradition, people did not even begin to read silently until the thirteenth and fourteenth centuries; Carr cites a passage from the *Confessions*, that notes Augustine's surprise at observing a bishop read silently to himself. Aspects of the reading process that seem so natural to us that they surely always existed, would have seemed quite unnatural to the average reader just a millennium ago. Augustine's observation is telling because it notes an early instance of the shift from reading as a public, shared experience to a private and individual one, just as we have seen happen to music and television – from radios and family TV sets to iPods and streaming video on laptops and tablets. From the time of Socrates' concern with the changing nature and relevance of human speech, the Internet has altered the significance of text and how we interact with it. There is less of a need for us to retain what we read. Everything is available and everything is immediate.

What is the relevance of reading and remembering when the Internet makes it impossible to forget?

Today, new media continually changes the way we read closely; most people would not be able to argue that they read text the same way on a computer screen as they do with a print book. The once distinct lines between different art forms and different media have grown less clear due to these changes to the digital landscape. But this discussion is nothing new; the idea of so-called "technological determinism" *(The Shallows* 46) has existed for quite some time. Our lives, our cultures, and our societies are as determined by our technologies as by us. In the words of Ralph Waldo Emerson, "things are in the saddle and ride mankind" *(The Shallows* 137). To use a few broad historical examples of this concept, one could contend improvements in ship technology created the existence of explorers and conquistadors; the capitalism-intense Gilded Age would never have been possible without the Industrial Revolution, not the other way around.

Perhaps the foundational text of media studies, Marshall McLuhan's *Understanding Media: The Extensions of Man* (1964) refocuses academic and popular concern away from the content of a medium and onto the medium itself. When a mother catches her young son watching a lot of television, she might tell him to stop, because "it's going to rot your brain." Here, it can be assumed the mother is talking about the content on the television: violent action shows or cartoons, for instance. But McLuhan's most famous statement contradicts this: "the medium is the message" (McLuhan 5). In other words, people should not be concerned with the content of television as much as the medium itself; how it changes the way we think and function in response to it. Writing in the 1960s, McLuhan was concerned with electronic media: television, film, radio, and telecommunications. He believed we were closing in on "the technological simulation of consciousness, when the creative process of knowing will be collectively and

corporately extended to the whole of human society" (McLuhan 31). While this sounds like a promising scenario, the idea that "the medium is the message," also sounds as a warning; as we become more dependent on different electronic and now, digital media, we also (often unwittingly) allow these media to change how we think, and thus affect our responses to them, other media, and ourselves.

Numerous other writers have explored the notion that the effects of a medium remain even more important than that of its content, an idea that contains unprecedented relevance as the lines between become less and less distinguishable from one another. In *Gramophone, Film, Typewriter* (1986), Friedrich Kittler also anticipated this lack of media clarity: "The general digitalization of information and channels erases the difference between individual media" (Kittler 102). As these lines continue to blur, people are consuming more and more of their media online or through electronic devices. And in "The Language of New Media" (2000), Lev Manovich refutes the notion that reading text on a computer should be considered new media compared to reading something identical in print. "There is no reason to privilege a computer in the role of media exhibition and distribution machine over a computer used as a tool for media production or as a media storage device. All have the same potential to change existing cultural languages. And all have the same potential to leave culture as it is" ("The Language of New Media" 43). All media, regardless of their influence or how they are used, contain power to transform the human experience.

As Manovich realized a decade ago, activities that used to exist independently of one another – reading print text by getting a book from a bookstore or library, watching a film by going to a movie theatre, turning on the television set, or listening to music on a record, tape, or CD player – can now be done simultaneously on the same device. And the functions of these

devices are becoming less distinct all the time. Now you can watch a movie on your DVD player, watch TV on a tablet, and listen to music on your phone. These different media blend together most seamlessly, however, on a computer screen.[2] You can immediately switch between a YouTube clip, a streaming Netflix movie, a classic novel accessed through the public domain, skim news headlines, and check your social media accounts and email all with just a few clicks. Accessing a Dickens novel or a Shakespeare play online is a completely different experience from reading it in print form if simply because it can do so many other things simultaneously and presents so many distractions. At the same time, however, this experience offers new possibilities. Through the ability to search for words or phrases, link text together, and seamlessly connect a work with commentary, video lectures, or an entire body of knowledge about a particular text, one can create a more interactive experience, but this interactivity is not separate from the inevitable adulteration of text that this type of digital reading also entails.

Hayles mentions a quote from filmmaker Woody Allen: "I took a speed reading course and was able to read *War and Peace* in twenty minutes. It involves Russia" (Hayles 54). Several writers spanning multiple disciplines of study have recently begun exploring the notion that the Internet, in a sense, turns us all into speed readers; as people jump from link to link, from page to page, they lose their ability to do close readings of texts, and to do the long-form reading and writing that has represented the apex of academic prowess for centuries; it is the most significant representation of the idea of "extensive" reading, and encourages us to skim online texts with haste.

Hayles' observation is both a twenty-first century addendum to the ideas McLuhan first promoted over half a century ago, and also a technological manifestation of this transformation

[2] Here, the notion of a "computer screen" should be extended to include laptops, smartphones, and tablets

in reading style that has slowly occurred over many centuries At first glance, having access to so much literature and reading material online through sources like the Gutenberg Project and Google Books seems like a perfect extension of the world of print books, libraries, and bookstores. Now anyone with a computer screen and Internet access has a database of literary works at his or her fingertips that far exceeds the capacities of all the world's libraries. By 2010 (and despite the controversy of possible copyright infringement) Google had already scanned over twelve million books to its Google Books Library (Oder, 2010). In a sense, this sounds like the beginnings of a new golden age of information. And while this kind of access remains unparalleled, the mixing of digital media and a seemingly infinite print database does cause complications. If "the medium is the message" (McLuhan 5), then reading a book through one of these services online is, to some degree, a different personal experience than doing so through print. The way we read online amidst a sea of web pages, hyperlinks, audio and video, requires a different mode of reading and writing, one that in our current time, often makes the reading process more difficult.

We have all inevitably subjected ourselves to this supposed adulteration of the reading experience. Let's say you needed to locate a particular passage of *Ulysses* for an essay. You find a searchable version online and with a few keywords pulled from memory, have located the passage in question in significantly less time than it would take you to find by thumbing through a dense print copy.[3] Actually reading the passage once you've found it, however, can feel like an entirely different experience, particularly if the screen is littered with advertisements and hyperlinks are scattered across the text on the screen. While these links can certainly add useful

[3] As the studies cited by many of the authors mentioned in this section (Carr, Foer, Hayles, and Wolf) contend, however, recalling a unique word or phrase to locate the passage in question has become increasingly difficult recently.

information to the passage in question, they can also dilute your ability to conduct a serious close reading of it. Even if the screen is free of these distractions, the entire novel displayed on a single web page (as most simple text versions of public-domain works are organized) simultaneously presents a large amount of text online that overwhelms the reader's visual senses. It subconsciously encourages us to hurry through what we are reading, skimming the words in a race to the finish, and is at the very least, not conducive to the type of close reading needed for the reading project at hand.

Digital reading not only impacts how we read and interact with text on a personal level, it affects our human functions and capacities more broadly. A flood of research and numerous scientific studies attest to how digital technology pervades not just our reading abilities, but also our existence. Internet addiction has been considered a significant health concern and a topic of public discourse; a 2012 *Newsweek* cover story, "iCrazy: Panic, Addiction, Psychosis," declares that the Internet is not just taking control of our lives, but of our reading experience, and not for the better: "The goal is no longer to be 'in touch,' but to erase the possibility of ever being out of touch" (Powers 15). In addition, much objective and scientific research has been conducted on the effects and significance of these broad cultural transformations.

Nicholas Carr's article, "Is Google Making Us Stupid?" was turned into a full-length book: *The Shallows: What the Internet is Doing to Our Brains*, published in 2010 and a finalist for the Pulitzer Prize. Numerous other writers whose works, published around the same time as these, such as William Powers' *Hamlet's Blackberry* (also published in 2010), *You Are Not a Gadget* (2011) by the virtual reality pioneer Jaron Lanier, and *Alone Together*, MIT Professor Sherry Turkle's account of how technology deeply affects our relationships with one another all tackle these issues with unique perspectives and engage in conversation with one another about

the relationship between technology and the mind, that in many ways, has come to a significant crossroads.

The Shallows, like many of these current works, concentrates almost entirely on the consequences of the Internet, and laments that we sacrifice much more than we gain. Carr first broadly examines the way that other devices have changed the way we think: the clock made us less aware of the change of day in relation to the Earth's movements, and the map replaced our need for an intuitive sense of direction. He expounds upon the "plasticity of the brain," (23) and, like McLuhan, argues that concerns about the effects of a new medium itself should far outweigh those of its content: "As the same experience is repeated, the synaptic links between the neurons grow stronger and more plentiful through both physiological changes such as the release of higher concentrations of neurotransmitters, and anatomical ones, such as the generation of new neurons" (27). While people will still certainly read books and appreciate their significance and beauty for a very long time, print books are losing their cultural force and role as the primary transporter of human knowledge and human thought. Numerous works of literature written in print today suggest that experimental creativity and innovation exists in print, yet achievements like this are far from the norm.[4] The humanities, as a broad area of study, have become increasingly more digital by the day.

Like the clock and the map, the Internet has changed the way we think. It outsources certain parts of the mind and gives us room to perform new functions. But, in this instance, has the outsourcing gone too far? "By combining many different kinds of information on a single screen, the multimedia Net further fragments content and disrupts our concentration" *(The Shallows* 91). Carr's basic conclusion revolves around the notion that while projects like the

[4]Hayles suggests the recent releases of innovative and elaborately designed books like Steven Hall's *The Raw Shark Texts* and Mark Danielewski's *Only Revolutions* and *House of Leaves*.

Google Book Project give us access to an unprecedented amount of information, the way the Internet is designed and the way we think about it alter the internalities of the brain itself. Carr quotes Walter J. Ong when he says, "Technologies are not mere exterior aids but also interior transformations of consciousness, and never more than when they affect the word" *(The Shallows* 51). The advent of clocks begat numerous metaphors concerned with how we think about the world: God was "the great clockmaker;" things that are efficient "run like clockwork." Likewise, our brains' dependence on computers has in turn, not only shaped the way we think, but how we think about and conceptualize the brain itself. We use phrases like "that's how his brain is wired" that metaphorically liken the human mind to a machine. It keeps us from being able to access this information in a deep way, and reworks our brains to jump from link to link and page to page, inundating our minds with information but not allowing us to focus long enough for any of it to make an impression in our long-term memory.

Carr contends that digital reading not only decreases our ability to remember what we have read, it hinders our capacity to remember anything at all. He employs a plethora of statistics, yet many are telling of just what an influence the web has over our lives, our brains, and at what a fast speed it continues to do so. From 2005 to 2009—only four years—the average amount of time adults in North America spent on the web doubled from six hours a week to twelve *(The Shallows* 86). Younger people use the Internet even more. According to the U.S. Bureau of Labor Statistics, the amount of time Americans over age fourteen spent per week engaged in print reading had dropped eleven percent, to just 143 minutes a week; print is the least used media category, lagging behind television, computers, and radio (*The Shallows* 87). On a broad cultural level, traditional notions of reading are clearly on the decline.

The Shallows goes on to discuss UCLA professor Gary Small's work on how digital media affects us on a neurological level. His 2008 experiment measured the brain activity of two groups—active Internet users and novice Internet users. When reading the equivalent of print text, their brain functions showed up identically. But when surfing the web, the active users exhibited heavy use of "the left front part of the brain, known as the dorsolateral prefrontal cortex" *(The Shallows* 121). After a week of increased Internet use, the novice group was retested, and startlingly had begun to exhibit similar brain functions even after such a short time. Small posits the question: "If our brains are so sensitive to just an hour a day of computer exposure what happens when we spend more time [online]?" (121). As people spend significant parts of their lives online—for many people, the majority of their waking hours—it changes the way our brains work, allowing us to more easily get lost in the sea that is the web, but making it harder for us to perform other functions as well.

Katherine Hayles engages directly with Carr in *How We Think* by discussing these issues from an academic perspective; she includes discussion of how the Digital Humanities change academic research and scholarship. Her focus on broader notions of reading itself in a digital age, however, remains extremely insightful. Critical reading skills have declined across all levels of education. "The results are consistent: people read less print and they read print less well" (56). For instance, she references Mark Bauerlein's work, *The Dumbest Generation*, which claims that almost no correlation exists between digital reading and print reading; the type of knowledge gained from one does not usually translate to the other. But Hayles, as a scholar, lauds the possibilities for digital reading within the study of the humanities, at least inside the university: "After more than two decades of symptomatic reading, however, many literary scholars are not finding it a productive practice" (59). The new forms of reading, thinking, and

teaching that inevitably arise from digital media remain an enticing prospect, at least in theory. The writing of early hypertext proponents like George Landow has, in the eyes of many writers, been devalued due to overwhelming anecdotal evidence that suggests people cannot read as closely or retain what they read online as well as they can with print. On the whole, however, Hayles' work focuses on academic uses of digital media, and largely ignores the broader effects that Carr discusses.

One could eventually view digital reading as a completely separate process from more traditional reading. Hayles and Carr inevitably cite several of the same studies that indicate as much; research at the University of Michigan showed that reading comprehension, as measured through a written summary and multiple-choice test, declined across a group of test subjects as the number of links throughout the given passage increased. Psychologists at the Centre for Applied Cognitive Research at Canada's Carleton University claim similar results: they found "very little support" for the theory supported by people like George Landow "that hypertext will lead to an enriched experience of the text." Rather, "increased demands of decision-making and visual processing in hypertext impaired reading performance" *(The Shallows* 129). Widespread results like this raise concern about the relative lack of merit for hyper-reading, at least among generations of people unknowledgeable about how to do so.

Close reading will only maintain relevance if it can function symbiotically with these new modes of reading, rather than standing in opposition to them, as well as with other media forms: film, television, interactive media, etc. After all, the lines between these forms have grown increasingly blurrier. Unlike Carr, Hayles positively views the possibilities of an organic relationship between these three different types of reading: close, hyper, and machine reading in our age of media convergence. For instance, a course called "Literature+" taught at the

University of California at Santa Barbara, encourages students to take literary texts and examine them in an interdisciplinary, technical manner "including visualization, simulation, storyboarding, and game design" (Hayles 75), and connect literature with other media. Literary academics have long encouraged and explored different types of reading and examining texts from a variety of disciplines in distinct ways in order to glean even more understanding from them. In the end, the different ideas promoted by Carr and Hayles are a matter of perspective. Hayles, as a prominent academic, acknowledges the inevitable tradeoffs that exist when one reads digitally, but is enthusiastic for the new avenues of reading and learning it opens for us. Carr, on the other hand, engages this problem from a more popular perspective and laments the inabilities for most people–adults and students of all ages–to do the kind of reading they used to be able to undertake. In both instances, it becomes clear that the possibilities of digital media remain endless; we just need the ability to think consciously and deeply about how and why we use them.

All of this evidence connects with Maryanne Wolf's call for "multitextual readers." Children spend the first years of their formal education learning how to read linear, print texts, yet (partially due to the newness of hypertext media) we have inevitably approached this kind of digital, non-linear reading and thinking process with our deeply ingrained notions of linear reading. It is, after all, how all of us were taught to read. Wolf posits that the inundation of information and links on each web page encourages us to read faster, and we do not give each word the required time for us to fully make connections with it in our brain. Hayles cites a study that concludes people tend to read in an "F pattern" in which they read the first few lines of a page all the way across, but gradually begin to read just down the left margin as they move further down the page. This inherently makes reading on digital reading a more superficial

experience, one that takes away from the "gift of *time to think beyond*" that she claims is "the reading brain's greatest achievement" (229). Her neurological research indicates that the human brain requires 500 milliseconds in order to adequately focus on each word and draw connections between other words and phrases in each sentence, paragraph, and text, as well as with external connections within people's brains; other things they have read, personal memories, thoughts, and ideas unique to them. Carr uses a similar term for this phenomenon: "working memory," which "forms, in a very real sense, the contents of our consciousness at any given moment" (*The Shallows* 123). The kind of superficial skimming people seem to inevitably do through digital platforms does not necessarily enable them to make these connections, and without them, it is harder to generate memorable, relevant thoughts about one's reading.

In *Proust and the Squid*, Wolf designates the brain's three main design principles in relationship to reading:

> The capacity to make new connections among older structures; the capacity to form areas of exquisitely precise specialization for recognizing patterns in information; and the ability to learn to recruit and connect from these areas automatically. In one way or another, these three principles of brain organization are the foundation for all of reading's evolution, development, and failure. (Wolf 12)

Wolf utilizes her psychological and developmental background to question whether the unique act of reading in relation to one's cognition can exist in our digital era of information overload. "When seemingly complete visual information is given almost simultaneously […] is there either sufficient time or sufficient motivation to process the information more inferentially, analytically, and critically?" (16). To her, today's Internet world (she is particularly concerned about reading development among young children in a digital age) is one of "continuous partial attention" (22). This again echoes one of the concepts Carr presents: the notion of a person's "cognitive load […] when the load exceeds our mind's ability to store and process the

information—when the water overflows the thimble—we're unable to retain the information or to draw connections with what is already stored in our long-term memory. We can't translate the new information into schemas. Our ability to learn suffers" (*The Shallows* 125). Both of these writers stress the human brain's difficulty processing information at the speed computer reading demands of it.

All of this research should draw concern, but as Gopnik contends in his *New Yorker* essay, it is still easy to side with the "Ever-Wasers" who argue that concerns like this always have and always will be commonplace. It is "an eternal fear: the fear that a new technological achievement could abolish or destroy something that we consider precious, fruitful, something that represents for us a value in itself, a deeply spiritual one" *(The Shallows* 102). Socrates and the Renaissance classicists and mnemonics enthusiasts clearly felt this way. And the way we interact with our technologies today clearly make people feel similarly: any piece of information can be retrieved in seconds. In today's culture, when people ask someone else to help them recall a fact they are struggling to remember, they are often met with a response of "I don't know, just Google it." Plus, the infinite information that inundates our screens online psychologically makes us skim and skip from one thing another, eager to finish what we're reading and move on to the next page, the next piece of information, never needing to keep anything in our minds, eager to find more.

It is a paradox not acknowledged by Carr, however, that the ability to conduct different modes and reading would not be possible without a brain that would allow us to adapt, and this plasticity is now causing fears about our reading establishment. Wolf even goes so far as to suggest that the existence of dyslexia evidences that reading is an unnatural human activity, one made possible by six thousand years of development and adaptations to the human brain.

Socrates, for one, felt as much. Also, the way peoples' brains work in relation to speech, text, and reading is inconsistent across different languages. Wolf provides an anecdote of a man bilingual in both English and Chinese who suffered a stroke to his brain's posterior areas. He could no longer read Chinese, but his English was just fine. Likewise, people reading English and French show significantly more neurological activity in the areas of the brain devoted to visual activity than those that read German or Italian, likely due "to the greater emphasis on morphemes and irregular words (such as "yacht") in English and French [which] requires more visual and orthographic representation knowledge" (Wolf 152). The different ways in which our brain deciphers different languages denotes a certain amount of arbitrariness. The fact that people's brains function uniquely depending on the language shows, on a neurological level, there is no right way to read.

This is reminiscent of the most basic theories of early twentieth-century linguistic theorists like Ferdinand de Saussure, who in his *Course in General Linguistics*, suggests that the "bond between the signifier and signified is arbitrary" (Saussure 85). An idea or concept is represented by a collection of symbols (letters) and a collection of sounds (syllables that make up a spoken word). The relationship between these elements (signs, signifiers, and signified) remains arbitrary. Even the alphabet—regardless of the seemingly random specifics of the letters—is still a random system, even when convincing claims can be made about the efficiency and facilitative ease made possible by it. The progression of alphabetic writing across different cultures: cuneiform, Linear A, Linear B, etc., in a tautological way, exists because that is the kind of writing that has existed. Wolf discusses systems of reading and writing that might seem completely foreign to cultures in which the Western alphabet is so deeply ingrained, such as the Incan system of *quipus*, dried fibers that, through a system of a detailed knots and attachments,

represent an undeciphered system of language. Systems like this are completely different from the modern alphabet, and although the very same sentence can be read through each system, the way our brains would operate to accomplish both would likely remain entirely different. On a simpler level, it would be easy to argue that reading someone's handwriting requires, at least subconsciously, a different method of reading. As Wolf's book talks about the different ways in which people learn to read, such a dependence on web reading is particularly troubling for developing reading. Our school systems expect children to master the art of reading in such a comparatively short period of time—Wolf gives an average of about two thousand days. But if authors as different as de Saussure is with Nicholas Carr and Maryanne Wolf can bring forth claims that can directly or indirectly suggest that one's reading development occurs differently on the web, is this not as reminiscent of reading a different language than it is reading the same words in print? The relationship between sound and signifying system suggests as much. Just as bilinguals reap extra benefits from being able to draw connections in multiple languages, one could presume expert readers who are bitextual or multitextual, would benefit from their ability to read both print and digital texts; buffering their abilities to read closely and skim and mine online text and data.

Regardless, readers and reading will move forward into our digital age. There is, as Wolf suggests, "no end to the development of the reading brain." (162). Reading changes our lives and our lives change our reading. It is a great paradox that if our brain plasticity—that beautiful and curious ability for our minds to adapt, change, and respond to new technologies and innovations—did not exist, then we would be incapable of generating discourse about the dangers of brain plasticity and how it affects our ability to do the types of reading so influential to our society. At one point, our brains had to adapt to the ability to read in the first place: just as

we now seem to be transforming from a print to a digital culture, societies at one point shifted from oral cultures to written cultures. And while six millennia remains a relatively short time (at least compared to all of human history) for the cultivation and nearly universal usage of the integral component of our society and its development, we are just now beginning to understand the significance of the written word and how it functions in the human brain. Digital technology is used much more widely now than it was even two decades ago, and many technologies crucial to our everyday lives: smartphones, cloud computing, even the Internet itself, did not exist twenty-five years ago. As we move forward into an age full of new technologies and the possibilities they bring, we must be cognizant of the stark differences between what we are gaining and what we leave behind. The Internet's most obvious difference from its electronic media predecessors is its bidirectionality.[5] People are not simply passive recipients as with television and radio, but can send information, and choose how they move through it. So as we shape the Internet, it is shaping us as well, more quickly and more severely than any medium that has come before it. People are certainly doing less traditional print reading than ever before, but the wealth of writing available online also means they are still doing more reading than ever before. The research and anecdotes given by writers like Carr, Hayles, and Wolf, however, should make us realize that these two types of reading are not the same and should not be treated as such. So that the benefits of these tradeoffs outweigh their costs, and in order to reap all the potential benefits of a hypertext reading experience, we must cultivate our abilities as "bitextual" and "multitextual" readers who are able to conduct different types of reading interchangeably and can draw from the vast wealth of human knowledge accessible through online reading while also making sure it does not completely supplement our ability to do the slow, thoughtful close

[5] This bidirectionality, it is worth noting, directly refutes Socrates' observation that writing is at fault because it, like painting, "maintains an aloof silence" (*Phaedrus*)

reading that allows our brains to make invaluable connections between what we are learning and what we already know.

A LABYRINTH OF LABYRINTHS:

HYPERTEXTUAL HARBINGERS AND EXPERIMENTS

In 2010, an obscure thirty-five-year-old writer named Quentin Rowan submitted his debut novel, tentatively titled *Spy Safari*, to a literary agent. An over-the-top homage to the Ian Fleming knockoffs prevalent in the 1960s and '70s, Rowan's novel reworked and parodied the formulaic tendencies of typical espionage novels. When the suspense division of Little, Brown picked it up, however, his editor demanded that he replace many of its exaggerated Bond-style characteristics and remold his story into a grittier, more modern spy novel. After several months of revisions, Rowan (writing under the pen name Q.R. Markham) changed the title to *Assassin of Secrets*. During the novel's promotions ahead of its November 2011 release date, commendations from established spy novelists and positive early reviews forecasted the book would be a hit.

The book's path to success, however, soon turned into one destined for literary infamy. A fan posted an excerpt of *Spy Safari* on a James Bond fan site. Within hours, however, another fan noticed Markham's debut had "entire paragraphs copied verbatim" from *License Renewed*, John Gardner's continuation of the Bond character after Fleming's death (Widdicombe). Using search engine tools, people quickly discovered that *The Assassin of Secrets* not only plagiarized from two or three other novels, but also countless sources from a variety of writers and genres. By one account, there were "thirty four instances of plagiarism in the first thirty-five pages" (Widdicombe). People soon discovered the entire novel was a collage of other writers' work, slightly altered to form a coherent narrative. Unable to replicate the early success one of his (original) poems had when it was anthologized in the *Best American Poetry* series while he was

in college, or confidently meet the expectations of publishers, Rowan had published heavily plagiarized short stories and articles for years without anyone noticing. In a desperate attempt to regain the recognition that authorship entails, he had given up authorship entirely.

Featured in a February 2012 *New Yorker* article, "The Plagiarist's Tale," Rowan's story provoked several reactions. Many wondered why he had so desperately attempted to plagiarize when it seemed much more arduous of a process than just writing it himself. Some even went as far as to laud his creation as art. Many, however, felt that Rowan had committed sacrilege. Author Jonathan Lethem[6] suggested the reason *Assassin of Secrets* troubled so many people was not Rowan's moral violation as much as "that it reminds us of the vast gray area that we all occupy" (Widdicombe). Rowan tried to morph his intricate collage of stolen references into one of the most linear and plot driven literary forms: the genre novel. But instead of trying to hide the true nature of his creation, what if he had flaunted it? "We live in an age of sampling" where constant borrowing and mashing together of various pieces and fragments of text available online is the norm (Widdicombe). Along with its effects on close reading, digital media has in turn created new possibilities for both creating texts and altering preexisting ones, most prevalently through the advent computer-assisted human reading. The Internet pushes the network of even the most seemingly disparate allusions, references, and influences that pervade every literary work to the forefront. Hypertext replaces internal significance with meaning outside of the text itself. In a sense, it gives everything an exegesis.

Like the broad cultural concerns posited by a variety of writers like Carr, Hayles, and Wolf, an interest in the possibilities of literary texts that display an element of nonlinearity is

[6] In the 2007 *Harper's* article "The Ecstasy of Influence: A Plagiarism," Lethem attempted a similar feat—his lengthy article consists almost solely of quotations and passages taken from a variety of sources. Lethem's "writing," however, acknowledges all his sources in what is ultimately a literary stunt.

nothing new; our literary history has maintained a complex relationship with ideas of originality. *Assassin of Secrets* certainly exists on one extreme end of the spectrum of originality, but while most writers never consciously lift entire passages from another author verbatim, no text exists in a vacuum. We exalt the singular and original genius of Shakespeare while also fully aware that the plots of the majority of his plays are borrowed from classical and historical source material. Harold Bloom calls this idea that poets and writers are hindered by their uncertain relationship to the past, "the anxiety of influence" (Bloom 1797).

In his play *Arcadia*, Tom Stoppard writes beautifully of the networks and relationships inherent to all human creation:

> We shed as we pick up, like travellers who must carry everything in their arms, and what we let fall will be picked up by those behind. The procession is very long and life is very short. We die on the march. But there is nothing outside the march so nothing can be lost to it. The missing plays of Sophocles will turn up piece by piece, or be written in another language. Ancient cures for diseases will reveal themselves once more. Mathematical discoveries glimpsed and lost to view will have their time again. (Stoppard 38)

If every work of art, as these writers contend, naturally exists within a network of other creations—past, present, and future—does this make hypertext an ideal medium for the creation and transmission of knowledge? In many ways, hypertext is the culmination of a long shift from the linear, closed Aristotelian notions of plot and structure to the recognition of a deliberately open network of meaning.

Links remain the principal element web reading appends to the human invention of reading and writing. The link, so integrally intertwined with web reading as to become virtually unnoticeable, has often become taken for granted. But, it is the building block on which the development of our information age rests. And it demands an active reader who is often required to, as George Landow suggests, "abandon conceptual ideas founded on concepts of center,

margin, and hierarchy" (Landow 1), and focus on a work of literature not as a closed system with a beginning and an end but as an entire system of ambiguities, references, allusions, and meaning generated from both inside and outside the borders text itself.

Myriad twentieth-century writers—novelists, poets, critics, and theorists alike—recognized and explored the possibilities of open, referential, and nonlinear texts well before the development of digital hypertext systems. Many of these new kinds of literary works were in deliberate opposition to their predecessors; they demand a very different type of reader and reader response than more traditionally structured stories, novels, and poems. Primarily stemming from Modernist literature, they in many ways predict and anticipate the new types of readers and hyper-reading methods that an era of digital media encourages. In the disorder characteristic of many aspects of life and literature during this period, many Modernists perceived the world as fragmented, "full of loss, disillusionment, and despair in the wake of the Great War" (Murfin and Ray 307). This pervasive, post-war disillusionment characteristic of Modernism is reflected in the rejection and subsequent replacement of traditional literary forms and with more brazen experiments of form and language. As Kevin J.H. Dettmar notes in "The Illusion of Modernist Allusion and the Politics of Postmodern Plagiarism," "though the technique of allusion dates back to the earliest days of English poetry, it was elevated to the status of master trope in modernist fiction and verse" (99). After the horrors of World War I, "Modernists injected order by creating patterns of allusion, symbol and myth" (Murfin and Ray 307); they believed their works could counter its chaos through the creation of highly structured texts that were full of meaning inside and outside of the borders of the literary piece itself.

This intertextuality inherent to Modernism in many ways predicted the ultimate inter-textual machine: the computer, a machine with much less linearity than the printed word—a

book, magazine, or newspaper—that could theoretically give writers a new medium by which to continue to push the boundaries of literary creation.[7] Hypertext scholars like George Landow note that "hypertext, which is a fundamentally intertextual system, has the capacity to emphasize intertextuality in a way that page-bound text in books cannot" (Landow 55). Consider a complex source like the "Nausicaa" section of Joyce's *Ulysses*, which alludes to many other works of literature (as well as phenomena that cultural theorists would consider texts): the corresponding section of the *Odyssey*, the popular magazines and advertisements that enter the characters' thoughts, the streets and landmarks of Dublin, and aspects internal to the novel itself. In a situation like this, the use of hypertext, Landow argues, "permits one to make explicit, though not necessarily intrusive, the linked materials that an educated reader perceives surrounding it" (55). The Internet (or another hypertext-based system) allows the reader to respond to the idea of "textual openness: the ability to perceive the things that exist outside of a text that give it its significance" (55).

Allusion, as T.S. Eliot says in his review of *Ulysses*, is "'a step toward making the modern world possible for art' […] but the success of allusion, as Eliot must at some level have realized but seems never to have admitted, depends always on its recognition by a properly educated readership" (Dettmar 100). Dettmar raises the question of what happens when, like Rowan's years of blatant plagiarism, this allusive borrowing remains unnoticed? The allusive writing of someone like Eliot makes it a necessary thing to ask. An allusion to Spenser's *Prothalamion* in "The Fire Sermon," for instance, is most widely known today for Eliot's allusions to it. Dettmar contends that this, in a sense, constitutes plagiarism. "Notes pretend that

[7] It is worth noting, however, that computing and calculation machines had been discussed and even designed long before Modernism. Charles Babbage "is credited by most historians of technology as having been the first person to conceive of a computer" (Clayton 110). During the reign of Queen Victoria, his Difference Engine and Analytical Engine projects received governmental support.

all sources can and will be noted, and that the author is able to map the network of intertextual relations that cut across his poem. This illusion of mastery of the intertext, however, is easily shattered; for no matter how fastidious the annotator, the intertext will always overflow its intentional references (101). These compositions are clearly collages of references, but at what point do they cease to be references and exist as part of the text that alludes to them, separate from the initial text itself?

It is not only the Modernists' allusive compositions that suggest a connection between their work and hypertext. John Whittier-Ferguson's *Framing Pieces* explores Modernist authors' exegesis of their own works, the "notes, marginalia, critical essays, and longer prose" (Whittier-Ferguson 3). This "apparatus also addresses and helps to create their conditions for the reception of the framed texts" (3). While writers outside of the Modernist tradition have undoubtedly publicly scrutinized their own works and created similar literary "scaffolding" (4), it remains a prominent aspect of Modernist texts.[8] Thus the writers of these works, which can often seem incoherent, mystifying, and baffling, provided explanatory schemas that showed the underlying structure many of these works possessed.

Renowned modernist writers like T.S. Eliot, James Joyce, and William Faulkner crafted works that while notably experimental and unlike the writing that had come before it, remained highly conscious of form, structure, and order. They designed tools to help readers navigate their complex, allusive, and often nonlinear styles: Eliot created a set of notes for his *Waste Land*; Joyce released a schema for *Ulysses* to prove to readers that, in fact, there existed a very deliberate (and allusive) method to what many thought of as madness; and Faulkner desired

[8] Not only was this relevant because their works were filled with "patterns of allusion, symbol, and myth" (Murfin and Ray 307) but also socially, by "a decade that will not allow aesthetic grace alone to justify the pursuit of art" (Whittier-Ferguson 4).

(although potential production costs kept his vision from fruition) that the initial "Benjy section" of his *The Sound and the Fury* be printed in a multitude of colors that would serve as a key to navigate the intricate temporal shifts of his stream-of-conscious narrative.[9]

Eliot's own notes for the *Waste Land* came about partially out of desperation; the public readership largely lacked the ability to discern the poem's complexities. Joyce was "a covert manipulator of his public perceptions" (Whittier-Ferguson 4). He released his schema for *Ulysses*—at least in part—out of frustration that readers did not appreciate the unbelievable level of detail he placed throughout his novel. Does the fact that a contemporary reading of *The Waste Land* or *Ulysses* all but requires footnotes (or in the case of many Joyce seminars, an annotated version of the text that dwarfs the size of *Ulysses* itself) devalue the inherent literary worth of these texts? Perhaps this is why scholars have never granted Joyce's *Finnegans Wake* the same canonical status as his earlier work—even with the publication of numerous exegeses that attempt to frame, explain, and plot out its linguistic and narrative complexities, it seems no guide can make perplexed readers feel as if they can comprehend the work's complexities.

It was not just Modernist writers like Eliot, Joyce, and Faulkner whose works of literature presaged the coming relevance of hypertext. Three writers operating outside of the conventional spatiotemporal boundaries of High Modernism—Jorge Luis Borges, Vladimir Nabokov, and Julio Cortázar—did just that. These authors forced their readers to "continually shift the center—and hence the focus or organizing principle—of their investigation and experience" (Landow 56). This type of writing was much different than Eliot's network of allusions, Joyce's highly

[9] Due both to the fact that this type of project is more financially feasible today, and also as an attempt to revive interest in a classic text, Faulkner's fourteen-colored desire has become a reality: "bound in vermilion goatskin and limited to 1,480 copies, an opulent new edition of *The Sound and the Fury* (Folio Society, $345) is intended for collectors and well-heeled Faulkner lovers — and it has already sold out" (Boyagoda).

constructed forms, and the inclusion of exegeses for the works of the Modernists. These later experimental writers "use footnotes or other textual devices as hyperlinks to connect chunks of text and thereby enable navigation of the narrative as a network rather than a linear path" (Pressman 9). As opposed to his designation of "nonergodic literature" which consists of texts in which the responsibilities placed on the reader only include basic eye movement and page turning, electronic literature scholar Espen Aarseth's designation of "ergodic literature" combines the Greek words for "work" and "path" to suggest that, "nontrivial effort is required to allow the reader to traverse the text" (Aarseth 1).

One of the most significant contributors to this "ergodic" strain of literature in the twentieth century, Jorge Luis Borges' short stories focus on abstract themes like dreams, labyrinths, mirrors, and infinity, a perfect subject matter for the textual devices that see the literary form as a nonlinear experience. The title of his "The Garden of Forking Paths" (1941) alone suggests a type of narrative that deviates from a traditional linear structure. Masked as a World War I era spy narrative, the protagonist, Dr. Yu Tsun, a Chinese-born, German spy living in England (this description alone presents a character made up of a combination of sources) must somehow reveal to the Germans the location of some English artillery. As he concocts a plan, he also views his actions in a removed, nonlinear way: "*He who is to perform a horrendous act should imagine to himself that it is already done, should impose upon himself a future as irrevocable as the past*" (Borges 121). As he goes to visit Dr. Stephen Albert, a Chinese scholar, one of Albert's neighbors instructs him to take only left turns, which reminds Tsun of a maze. He remembers his great-grandfather, a provincial governor who "renounced all temporal power in order to write a novel containing more characters than the *Hunge Lu Meng* and construct a labyrinth in which all men would lose their way" (122). After devoting thirteen years to these

tasks, his ancestor was murdered. “His novel made no sense and no one ever found the labyrinth” (122). Imagining the lost labyrinth, Tsun “pictured it as infinite—a labyrinth not of octagonal pavillions and paths that turn back upon themselves, but of rivers and provinces and kingdoms…I imagined a labyrinth of labyrinths, a maze of mazes, a twisting, turning, ever-widening labyrinth that contained both past and future and somehow implied the stars” (122). In Albert’s house, they discuss Tsun’s ancestor’s novel, which Tsun finds unreadable: “The book is a contradictory jumble of irresolute drafts […] in the third chapter the hero dies, yet in the fourth he is alive again” (124). Albert then reveals, “it occurred to no one that book and labyrinth were one and the same” (124). Albert shows him a letter from Tsun’s forefather: “*I leave to several futures (not to all) my garden of forking paths”* (125). The infinite labyrinth, the “labyrinth of labyrinths” is one that exists not spatially, but temporally: “In all fictions, each time a man meets diverse alternatives, he chooses one and eliminates all the others; in the works of the virtually impossible-to-disentangle Ts’ui Pen, the character chooses—simultaneously—all of them. He *creates*, thereby, ‘several futures,’ several *times*, which themselves proliferate and fork” (125). This infinite network of bifurcations does, however, feature some convergences; Albert suggests Tsun could come to his house from two different paths: one as enemy and one as friend. He also reveals that the novel never features the word “time.” In doing so, Albert suggests, it draws attention to itself as a riddle, whose answer is time, “an infinite series of times, a growing, dizzying web of divergent, convergent, and parallel times” (127). The story ends as Tsun kills Albert as part of his own labyrinthine signal to the German army: newspaper coverage of the story alerts his German contacts to bomb the artillery in the city of Albert. Labyrinths themselves are symbolic. Minos locked up the Minotaur in one not because it would be more effective than the prison, but simply because of the symbolism it implied—the idea of being lost, in a space

with no clear perceptions of direction, of forwards and backwards. Borges' idea of labyrinthine literature is not significant because of its nonlinear structure but because of its endless possibilities within an infinite network of decisions; hypertext, according to Borges' model, is not significant because of its disorienting nonlinearity, but because of its potential endlessness.

Vladimir Nabokov's *Pale Fire* (1962) also serves as a hypertext precursor. This "novel" is made up of a foreword, a 999-line poem in heroic couplets entitled *Pale Fire*, an extensive commentary section, and an index. It both parodies literary scholarship and also places immense value on its ability to influence one's reading of the book. As the reader navigates these different textual components (whether in a linear or nonlinear fashion), he or she soon surmises that the titular poem itself, written by the reclusive (and entirely fictional) poet, John Shade, is secondary to the notes, which do little to discuss the poem itself and instead construct a first-person narrative about the poem's eccentric self-designated editor, Charles Kinbote. The poem itself is personal, digressive, and allusive, beginning (and ending, with Kinbote's assertion that it was to be an 1000-line effort), "I was the shadow of the waxwing slain / By the false azure of the window pane" (Nabokov 33). This novel's implications stem largely from an ambiguous and unclear notion of authorship. The commentary discusses Kinbote's relationship with Shade, the King of the fictional kingdom of Zembla (Kinbote's homeland) and the circumstances of Shade's murder far more than intricacies the poem itself. The commentary also remains metafictionally conscious of Nabokov as an author—one note concerns "Hurricane Lolita" (243), for instance. Kinbote is unreliable, but to what extent is uncertain. His voice certainly attempts to capture the reader's understanding from an early moment: "Although those notes, in conformity with custom, come after the poem, the reader is advised to consult them first and then study the poem with their help" (28). It consciously directs us to a non-linear reading experience. And since the

commentary is essentially Kinbote's story, it is as if *Pale Fire* gives us two authors, two ways to read the text, vying for our attention. The multitude of questions and contradicting opinions concerning authorship within the narrative itself—is Kinbote actually this exiled king of Zembla? Do this king and/or Zembla exist in the first place? Is Kinbote the alter-ego of the academic Botkin who teaches with Shade at Wordsmith College? Can we believe in Zembla if New-Wye, the fictional Appalachian setting for *Pale Fire* is obviously not real either? Within these four distinct yet related sections (Foreword, *Pale Fire*, Commentary, and Index) one can clearly see that the linear order in which a reader chooses to interact with *Pale Fire*'s nonlinear system of supposed "critical" and poetic writing has a profound impact on his or her understanding of the material—a phenomenon that has serious implications for a reading of hypertext, as well. The poem's meaning is no longer the definitive message of a Barthesian "Author-God" and thus disperses itself in an adulterated network of references. The more we try to assemble it into a linear, hierarchical structure, the more it breaks down into a nonlinear world full of ambiguities and uncertainty.

The work of another Argentinian author, Julio Cortázar, also pushes the boundaries of the novel form. His experimental work, *Hopscotch*, also published in 1962, gives readers choices that demand they take an active role in their experience of the narrative. Unlike the Modernists, Cortázar's exegesis does not exist as an addendum, nor is it actually a component of the novel itself. Rather, the reader encounters this scaffolding prior to reading *Hopscotch*. Directly following the title page is a "Table of Instructions" that declares, "In its own way, this book consists of many books, but two books above all. The first can be read in a normal fashion and it ends with Chapter 56" (in my edition, this is page 349 of the total 564 numbered pages, divided into 155 chapters). Cortázar then declares "the reader may ignore what follows with a clean

conscience." His "second" reading, begins with Chapter 73 and features a list of how to navigate the text in this second order (featuring all 99 chapters, many of which were not necessary to the first reading), jumping around as if in a game of hopscotch. The first section, consisting of chapters 1-36 is entitled "From the Other Side," and recounts the life of the protagonist, Horacio Oliveira, in Paris. Oliveira realizes early on that "this whole A B C of my life was a painful bit of stupidity" (Cortázar 12). Chapters 36-56 make up "From this Side," and take place in Argentina. The third section which consists of the remaining 99 chapters, is titled "From Diverse Sides: Expendable Chapters." The unclear ending of the "first book," however, can be seen as Cortázar's way of encouraging the "second reading" method, or at least a look into the expendable chapters. As well, Cortázar's notion that "this book consists of many books" suggests that any reading order is not only possible (as it would be with any book with chapter breaks) but encouraged. Whereas Joyce's exegeses are constraining frameworks by which to comprehend authorial intent, and Nabokov's structure leaves the reader in a state of uncertainty, lost in a work with no discernible beginning or end, Cortázar's novel relinquishes authorial control (somewhat) to readers, allowing them to form their own notions of meaning, order, and hierarchy, while providing a framework that still gives the story of Horacio Oliveira (and the more peripheral information available in "From Diverse Sides") a beginning and an end, regardless of where the reader decides to place them. Giving the reader permission to read only the first 56 chapters and close the book "with a clear conscience," Cortázar acknowledges the internal struggle people have with nonlinear texts, as they even subconsciously attempt to inject a notion of Aristotelian order into their interactions with narratives.

Along with these various creative writers, theorists of literature and philosophy like Roland Barthes, Jacques Derrida and Michel Foucault published critical works in the mid

twentieth century that both predicted and led to the rise of hypertext as a significant literary and cultural medium. They have actively explored the complex, ever-changing trichotomy between author, reader, and text for decades. Hypertext scholars like George Landow proclaim that, "over the past several decades literary theory and computer hypertext, apparently unconnected areas of inquiry, have increasingly converged" (Landow 1). As these writers created works of literature that exhibit a conscious and deliberate hand of craft and origination their reliance on other texts simultaneously devalues the author and notions of authorship.[10]

Roland Barthes' "The Death of the Author," (1967) points out "that a text is not a line of words releasing a single 'theological' meaning (the message of the Author-God) but a multi-dimensional space in which a variety of writings, none of them original, blend and clash" (Barthes 146). As Landow points out, "Derrida emphasizes textual openness, intertextuality, and the irrelevance of distinctions between inside and outside a particular text." (53). Media like hypertext "can break with every given context, engendering an infinity of new contexts in a manner which absolutely illimitable" (54). Literally: the possibilities of hypertext are infinite. And Foucault, in his *The Archaeology of Knowledge*, says that a work of literature is never completely clear in its meanings because "it is caught up in a system of references to other books, other texts, other sentences: it is a node within a network…a network of references" (Landow 2). All three of these theorists, through their separate writings, anticipate the decentering effects of hypertext: "as readers move through a web or network of texts, they continually shift the center—and hence the focus or organizing principle—of their investigation and experience" (Landow 56). These theorists focus on the need to abandon traditional notions

[10] "The Plagiarist's Tale" even suggests Rowan "could have used a dream team of literary theorists to get him out of trouble" (Widdicombe).

of literary study in favor of examining poems, novels, and broader structures that consist of their underlying ideologies through a nonlinear examination that lends itself perfectly to computer-assisted human reading, and vice versa.

Barthes, Foucault, and Derrida intersect with the later emergence of reader-response or reader-oriented criticism in the world of literary theory, which began "thinking about readers and the way they make sense of literature" (Culler 63), and can be seen in many ways as antecedents to the type of analysis required to look at the differences between print and digital reading experiences. Reader-response criticism emerged in universities in the United States in the 1970s, as both a continuation of the work done by Formalists and New Critics several decades earlier. Reader-response critics, however, took these Formalist theories in entirely new directions. In a hyper-textual context, this relationship possesses a bit of irony, due to New Critical theorists' emphasis on a work of literature's "intrinsic nature, concentrating their analyses on the interplay and relationship between the text's essential verbal elements" (Murfin and Ray, 189). That is, how it functions as a closed system. Critics like William Empson, however, in his *Seven Types of Ambiguity* (1930), do not view this closed system as possessing a final, absolute meaning; rather, they recognize the reader's role in attempting to decipher these ambiguities, "any verbal nuance, however slight, which gives room for alternative reactions to the same piece of language" (Empson 1).

Reader-response critics Stanley Fish and Wolfgang Iser, who many contend are the true founders of reader-response criticism, believe (in contention with their Formalist predecessors) that treating a work of literature solely as an object that does and does not function in certain ways is a misreading of the purpose of reading. In "Literature and the Reader: Affective Stylistics" (1970), Fish tracks the ambiguities of a particular line in *Paradise Lost* and says "the

concept is simply the rigorous and disinterested asking of the question, what does this word, phrase, sentence, paragraph, chapter, novel, play, poem, *do*?; and the execution involves *an analysis of the developing responses of the reader in relation to the words as they succeed one another in time*…a reader's response to the fifth word in a line or sentence is to a large extent the product of his responses to words one, two, three, and four" (Fish 73); he argues that the significance of a text does not lie in a static, Formalist analysis of the poem, but through the fluid, temporal experience of the reader.

Similarly, German theorist Wolfgang Iser contends that "the literary work is actualized only through a convergence of reader and text…the reader must act as co-creator of the work by supplying that portion of it which is not written but only implied" (Tompkins xv). Readers must try to bridge the gaps (which occur at varying levels of meaning) and ambiguous areas that occur during a reading of a text. The existence of these gaps occurs in different types of meaning: "pragmatic, semantic, or syntactic" (Murfin and Ray 194). By filling in these gaps, reader response critics argue that the experience of reading itself generates meaning alongside the text itself. Hyper-reading (that is, computer-assisted human reading) furthers the goals of reader-response criticism to transpose the agency of the author into a source of control for the reader. Both acknowledge active roles for the reader: Fish's issue of sequencing Rita Felski asserts that critical reading, "the holy grail of literary studies…assigns all value to the act of reading and none to the objects read, and asks: "Are these objects really inert and indifferent, supine and submissive, entirely at the mercy of our critical maneuvers?" (Felski 2-3). Felski's writing seems to frame reader-response criticism's relationship to hypertext in a way that theorists like George Landow have lauded and cultural critics like Carr have condemned: that this computer-assisted human reading lifts the power from the linear reading prescribed by the author and makes the

object read not “supine and submissive” but active, connected works that the reader can examine individually, from infinite angles and perspectives, in order to fill in the gaps that occur at different levels of meaning.

If theorists like Fish are concerned with how sequence affects reading, then hypertext certainly disrupts the reader’s ability to make sense of text. If the meanings of one part of a text are built on the meanings that come before it, then hypertext readers will experience the same text in extremely different ways based on the order in which they navigate it, further disrupting the author’s control of meaning and places it in the hands of the reader. The pervasiveness of digital media in our culture certainly affects one’s ability to read closely and remember words and sentences—whether on page or screen—on a large-scale, cultural level. But what new possibilities do digital media open for the future of literary reading and literary studies? In this era of constant innovation, McLuhan’s declaration that “the medium is the message” has never been more relevant: electronic media systems and devices are constantly changing; this has allowed artists and writers to create online-only works of literature that have taken the possibilities of literature in completely new directions. Simply, how do more traditional notions of literature—stories, novels, poems, etc.—function in our digital age?

Reading a familiarly structured work of prose or poetry through a computer-assisted human reading structure like hypertext is undoubtedly a different experience than doing so through print; the two biggest differences between close reading and hyper reading are the loss of an element of linearity and the creation of a bidirectional relationship between reader and text. In terms of linearity, the reader’s interactions with a close reading generally entail beginning a work on the first page, and turning them one by one until the last page is read. Granted, careful readers often pause to reread an earlier section, look up something of interest in an index, or

follow a superscripted number at the end of a sentence to a correlating footnote or endnote, particularly while reading poetry. Hyper reading, however, encourages the reader to examine text through a non-linear mode, and its primary method for doing so is its bidirectionality. The goal ceases to be to get from start to finish, from the first page to the last page, but to examine a web of networks made possible by links.

A HEAP OF BROKEN IMAGES:

A RECEPTION THEORY OF ELIOT'S WASTE LAND, THEN AND NOW

In the context of this discussion of the kind of literature that anticipated hypertext and its relationship with modern literary theory, how do the ways readers respond to a complex literary text change over time, from its inception to current digital iterations? There is a certainly a neurological gap between these two reading experiences, but how significant is it? Reception theory is a branch of reader-response criticism that examines how a literary work is received through history, from its initial printing to the present. The reception of Eliot's canonical modern poem, *The Waste Land* has changed drastically over the last ninety years; the experience of reading Eliot's poem has been undeniably different for its initial readers, print readers who have access to the extensive amount of writing done about it in the time since its publication, and readers of hypertext versions.

The seemingly endless allusions and references Eliot utilizes in *The Waste Land* make it a suitable text for hyper reading. It exemplifies the ways Modernism portends the need for a more non-linear type of reading, as well as the ways in which the way a reader interacts with a text influences, and is influenced by, the object read. Early critical responses to the *Waste Land* suggest that conventional ways to approach the poem today remain just one of many ways of reading the poem that arose out of its initial publication. A hypertext reading certainly challenges usual ways of reading. As we have already seen, however, the divergent ways in which the human mind approaches print and hypertext reading suggest that there are major discrepancies between these two modes. But is a version of *The Waste Land* in which hyperlinks, multiple windows of information, searchable and movable text replace standard footnotes, endnotes and

translations a different way of reading in kind or degree? That is, should it be approached as an extension of a preexisting medium, or a separate one entirely?

The *Waste Land* was published in 1922—the same year as Joyce's *Ulysses*—during what was clearly the height of literary Modernism. It was "famous even before it appeared in 1922, and it has continued to be the most influential, though not by any means the most popular, poem of the twentieth century" (North, ix). Ezra Pound, the poem's editor (and to whom Eliot dedicates it, referring to him as "*il miglior fabbro*" or "the better craftsman") used his influence to generate quite a bit of buzz about the poem in literary circles around the world before its publication. Because the *Waste Land* was initially released in slightly differing versions in several literary magazines and in book form in the year or so immediately following its release, a definitive original version of the poem does not exist. Across these differing volumes, however, one thing remained constant: everyone who read the poem was absolutely baffled.

In "IMMENSE. MAGNIFICENT. TERRIBLE.: Reading the Waste Land," a chapter in Lawrence Rainey's *Revisiting the Waste Land*, Rainey describes early readers' experience of trying to tackle the *Waste Land* blind; that is, without any of the notes, essays, and research to which a current reader would have ready access. This distinction includes Eliot's own controversial notes to the poem, which in many ways make it harder rather than easier to perceive. Certainly, the experiences of early readers were substantially different from that of a hypertext reading experience.

Rainey gives the account of John Peale Bishop, a young literary-minded Princeton graduate who, during his honeymoon in Paris in 1922, had purchased a copy of Eliot's magazine, the *Criterion*, in which the *Waste Land* had first been published two weeks earlier. In a letter

written to his friend (and soon-to-be-influential critic) Edmund Wilson, Bishop describes how the *Waste Land* rendered his own attempts at writing poetry all but futile:

> The chief difficulty is to eradicate T.S. Eliot from all future work…I have read *The Waste Land* about five times a day since the copy of the *Criterion* came into my hands. It is IMMENSE. MAGNIFICENT. TERRIBLE. I have not yet been able to figure it all out […] I have not of course had the advantage of the notes which you say the book version will contain. (Rainey 103)

Another letter quickly followed. Bishop had invited Ezra Pound and his wife to dinner (Bishop and Pound had previously met while Bishop worked for *Vanity Fair*). This second letter excitedly details some biographical information on Eliot gleaned from Pound (including his intermittent epileptic seizures and contemplations of suicide) before elaborating on his newfound comprehension of the *Waste Land* with seeming confidence:

> I think I've cleared up the meaning of the poem as far as it is possible. From Pound's account, it was originally twice as long and included Bleistein and all the old familiar faces. It's my present opinion that the poem is not so logically constructed as I had at first supposed and that is a mistake to seek for more than a suggestion of personal emotion in a number of passages […] Thomas's sexual troubles are undoubtedly extreme. (105)

He suggests that many of the poem's ambiguities have much more personal meaning than could ever be understood by its literary audience. As well, Bishop is relieved to learn, the famous "HURRY UP PLEASE IT'S TIME" line repeated throughout the *Waste Land* is simply what bartenders say as English pubs are about to close (a fact, no doubt, a current reader could learn from a footnote in almost any edition of the poem available today). This reaction is quite different from Bishop's initial comments concerning the "HURRY UP PLEASE IT'S TIME" line which he initially found to "make my flesh creep" (Rainey 104).

Despite this seeming relief, Rainey notes, "Bishop, in fact, would never quite get over the *Waste Land* or Eliot's accumulating oeuvre. The four volumes of poetry that he wrote over the

course of his lifetime bear witness to a poet struggling desperately to escape the shackles of a compulsive fascination with Eliotic motifs and devices" (106). But, his changing response to Eliot's poem remains significant to a comprehensive examination of the poem's history of reception; Rainey claims these letters are virtually the "the only record we have of how Eliot's work was first experienced by that hypothetical beast which has haunted so many literary discussions, the well-educated general reader" (106). Bishop's initial and numerous (at least five times a day!) interactions with the poem elicit a wide variety of emotions (horror, obsession, terror) seem to conflate into an overwhelming sense of confusion on multiple levels, from a basic lack of familiarity with English pub terminology to a deeper state of perplexity about who assumes the role of the poem's speaker at any given moment. Bishop's bewilderment supports both Fish's and Iser's notions of reader-response and their significance to Modernism (and by extension, hypertext): Bishop's confusion clearly builds as his reading of the poem's later lines is made even more difficult by his struggles with the parts of the poem that came before it; he seems unable to fill the gaps in the text and generate meaning and order from the uncertainties and ambiguities of Eliot's text. Modernism (and most certainly hypertext) suggests the inherent instability of reader-response criticism; this version of the *Waste Land* is as much a construct of Bishop's mind as Eliot's.

Through Pound's advice, what Bishop had been able to accomplish in between his first and second letters (which turned Bishop's reaction to "HURRY UP PLEASE IT'S TIME" from one of terror and confusion into one of confident discernment) was that "he had learned to attach identity to that previously mysterious voice […] The experience of that voice is no longer an unbearable enigma; it has a source that can be situated in space and time" (109). Likewise, Bishop's initial reading neither connects with a reading of the poem in the context of the Grail

legends and Jessie Weston's *From Ritual to Romance* (as do so many current readings) nor does it make him see the poem as a random "heap of broken images" (Eliot 22); from the start he is persuaded that Eliot's work is "highly constructed" (110). These frustrations with his inability to comprehend it, coupled with his own initial reactions exhibit a kind of tug-of-war between author and reader, both vying for the ability to place their own meanings within the framework of the text itself.

If despite their initial disorientations with the poem, Bishop and the poem's earliest reviewers (as Rainey also notes) felt that it possessed a deliberate design, does a reader's initial interaction with the poem via an annotated, edited, or especially hypertext version of the *Waste Land* allow him or her to experience the full range of emotions Bishop did? Does an edited version not make all responses more uniform? Bishop's ignorance of the Grail legend's role in the construction of the poem, for instance, not only demonstrates how peripheral these references are to the text of the *Waste Land*, but also exhibits that a serious reading of the poem can take place while ignoring these influences entirely; a reader of an annotated or hypertext version would be encouraged to consider certain lines in this context. Bishop originally described the poem as "IMMENSE. MAGNIFICENT. TERRIBLE." All serious readers can recall books that have caused them to feel powerful emotions. The way "HURRY UP PLEASE ITS TIME" interrupts the flow of the poem can seem disconcerting—even horrifying—despite its context. The revelation of this line's circumstances is lost in the immediate examination of a footnote or hyperlink explaining the meaning; the reader can easily lose this initial sense of wonder that could contribute to a unique reading of the poem.

In *The Uses of Literature*, Rita Felski contends there are four main "modes of textual engagement" – recognition, enchantment, knowledge, and shock (14). Does inhibiting the ability

to see the poem first with fresh eyes—as Bishop's first reading did—devalue the reading experience—at least in the sense of preventing a raw emotional response? Bishop's second letter goes as far as telling Wilson to "disregard" (105) his initial interpretation of the poem. Yet, despite his supposed confidence in discerning its true meaning (in terms of authorial intent, at least), Bishop could never quite escape the strong initial feelings the poem aroused in him; he could never quite reconcile the conflict between objective analysis and sheer human emotion. Close study of the *Waste Land* could not, without a doubt, take place without use of Eliot's notes and the footnotes provided by editors, but using them, in many ways, does not allow the reader to experience this full range of responses.

In *Revisiting the Waste Land*, Rainey also contends that the history of *The Waste Land*'s scholarship, and consequently the majority of the abundant critical tradition (which dictates what supplementary information is included in a heavily annotated or hypertext version) has emerged from a very specific way of reading the poem (looking at the *Waste Land* under the microscope of a particular critical tradition has been the impetus for decades, it seems). In addition to Bishop's letters, Rainey presents excerpts from several early analyses of the poem that exhibit the different types of reading the poem that initially emerged. Many of the *Waste Land*'s early readers, like *New York Tribune* book critic Burton Rascoe, focused on the poem's notes, which in many ways obfuscate rather than clarify its meaning.[11] Rascoe posits that the notes remain not just an addendum, but also are fastened to the poem itself, and remain as complex, full of meaning, and subject to analysis as the previous five sections of the *Waste Land*:

> To read the poem was to plummet through a series of broken sketches, antic turns, and fitful moments of oracular solemnity and lyrical intensity—a dreamworld

[11] For example, Eliot's footnote to a line about the bells of the Saint Mary Woolnoth church reads "A phenomenon which I have often noticed" (Eliot 22).

> experience that startled and disturbed. To read the notes was to find reference to "the plan," an arcane but ultimately identifiable logic that was dictating the poem's entangled movements, or perhaps even a narrative structure detectable behind its unruly opacity. (111)

Building off critics like Rascoe, so much of the criticism—and thus our current understanding of the *Waste Land*—stems from Vanderbilt University's Cleanth Brooks' reading of the poem studied in light of Eliot's later religious conversion to Anglicanism. Rainey argues this reading remains heavily influenced by Brooks' anti-secular and anti-popular culture oriented views; his *Waste Land: An Analysis* is printed in full in Michael North's Norton Critical Edition of the poem. Rainey goes as far as to invoke Aristotle's *Poetics* and its advice on realistic, coherent, and orderly plots, attributing what he claims is a gross misreading by Brooks to his traditional literary background and his subsequent need for an intuitive understanding of narrative and a subconscious need for shapeliness and meaning in our fiction and in our art: "tracts of time or sound, even textual time or sound, unpunctuated by the prospect of their being integrated into meaningful networks, are unbearable. Confronted with the inexplicable patterns and mazes of contradiction, we seek a hidden shapeliness that will enable us to accommodate them (124). This observation connects with the same need that resulted in Bishop's (at least temporary) relief in giving the sourceless voices of Eliot's poem an original voice. Rainey concludes by stating that "Brooks, though plainly a man who had a clear agenda, was also simply human" (125), conditioned to conduct this type of reading and this type of analysis of the poem. As a New Critic, Brooks' analysis rests on the idea that the poem is an intrinsic object, the meanings of which exist separately from the type of ordering internal to Brooks' way of reading it.

The discussion of other early critics, however, shows a much different side of *Waste Land* scholarship—while critics like Brooks have suggested the existence of a cognitive order

within the poem, others valued its sheer emotional power. Those that, like Edmund Wilson (the recipient of Bishop's letters), emphasize "the force of intention emotion" of a poem that "is intelligible at first reading" (112). Likewise, poet-critic Conrad Aiken, who foresaw the poem's "trajectory of critical discussion" as "a kind of epic in a walnut shell: elaborate, ordered, unfolded with a logic at every joint discernible" (114). Aiken emphasizes the poem's possession of "an emotional value far clearer and richer than its arbitrary and rather unworkable logical value" (114). He seems resigned to the ultimate unknowability of the poem's "arbitrary repetitions" (115), which tread the line between natural and artificial. Just as the beauty of Shakespeare's sonnets lies in the infinity of their ambiguities, Aiken, it seems, contends that one should never perceive this poem as a puzzle to be solved; Rascoe's and Brooks' responses seem less like readers and more like people attempting to convince a magician to reveal his secrets—in an attempt to figure out just how he pulled off the trick, it is easy to forget the sense of awe felt during the trick itself. "The poem succeeds—as it brilliantly does—by virtue of its incoherence, not of its plan; by virtue of its ambiguities, not of its explanations" Aiken concludes, and shows just how different readers' responses to the *Waste Land* can be (115).

Texts do not exist without readers actualizing potential meaning, but authors can also be considered readers of their own texts. As with Joyce's and Faulkner's elaborate plans for their works, Eliot's own responses to his poem and his notes reveals the fragility of the poem's most influential readings. John Whittier-Ferguson's account of the development of the notes, the construction of the "scaffolding" (Whittier-Ferguson 4) around which the study of the poem centers. In one 1956 lecture, Eliot went as far as to declare his notes "bogus scholarship" (although appearing as a celebrity in front of a crowd of 14,000 in a baseball stadium, seemingly attempting to distance himself from the persona of a recondite poet). "It was just, no doubt, that I

should pay my tribute to the work of Miss Jessie Weston; but I regret having sent so many enquirers off on a wild goose chase after Tarot cards and the Holy Grail" (Whittier-Ferguson 9).

Whittier-Ferguson also acknowledges the inevitable limits of Eliot's notes: "Certain references to vegetation ceremonies […] a preposterously inadequate clue to meaning, but the author cannot lead us much farther without becoming an intrusive, untrustworthy interpreter" (11). He even quotes Eliot directly, who admonishes his readership: "Instead of beginning, as he should, in a state of sensitivity [like that of Bishop's] he obfuscates his senses by the desire to be clever and to look very hard for something, he doesn't know what – or else by the desire not to be taken in" (Whittier-Ferguson 6). Is the author still the best guide to a text, or (particularly in the case of a widely studied poem like Eliot's) does a text remain removed from the motivations of its author? It is plausible (albeit somewhat cynical) to assume that the notes were at least partly included for financial reasons: new content merits a new edition, which means more books sold and more profit for Eliot and his publishing company. An argument could be made just as easily that an original, noteless release allowed even more hype to build as readers (like Bishop) felt simultaneous confusion and awe at the poem's austerity, and reread it repeatedly, attempting to become privy to its mysteries, and increasing the anticipation of the publication of the accompanying notes.

In light of the *Waste Land*'s complicated history of readership and understanding, what are the consequences of the numerous approaches an attentive reader uses to attempt to tackle the poem today? Through a comparison of the Norton Critical Edition edited by Michael North, and an amateur scholar's hypertext version (found at eliotswasteland.tripod.com), I will compare and contrast these oppositional ways to interact with Eliot's text. Both editions are heavily annotated (and North's inclusion of an essay by Cleanth Brooks, among others, evidences the direction in

which he takes his reading of the poem). How do they compare to the "blind" reading undertaken by Bishop[12]? How are these reading experiences different?

Should one go as far as to consider hypertext a different medium entirely? Simply by reading Michael North's well-annotated Norton Critical Edition of *The Waste Land*, one can sense a Barthesian absence of the author in the poem; it references so many different sources, from Dante, the Hindu *Upanishads*, and to popular songs of the era, that the authorial voice of *The Waste Land* is not Eliot as much as it is a conglomeration of other sources cut up and pasted together in a collage of complexity intended to generate meaning; many theorists discuss texts as distinct or disjunct from authorship. Eliot, as a proponent of New Criticism, no doubt would have at least been intrigued by this: "No poet, no artist of any art has his complete meaning alone. His significance, his appreciation is the appreciator of his relation to the dead poets and artists. You cannot value him alone; you must set him, for contrast and comparison, among the dead. I mean this as a principle of aesthetic, not merely historical, criticism" ("Tradition and the Individual Talent 1). Hyper-reading allows one to juxtapose disparate texts without resorting to historical criticism, allowing the careful reader to communicate, as Wai Chee Dimock observes, "why this text might still matter in the present, why, distanced from its original period, it nonetheless continues to signify, continues to invite other readings" (Felski 10-11). The merit of hypertext partly lies in its ability to point out and then visually connect this network of references, rearranging and configuring a text to more easily explicate its similarities and its differences to other texts. Texts are not resigned to function solely as a window into another time or place; rather, they function in the eternal literary present, combining together across space and time to

[12] Today, perhaps the best option for reproducing a "blind" method for reading Eliot's text comes in the form of the generated HTML version available through the Gutenberg Project (http://www.gutenberg.org/cache/epub/1321/pg1321.html).

influence the reader and lead to a wide breadth of reader interactions with a work of literature. Hypertext does not connect to other texts simply to look back to the past, but to connect everything into the present.

The Waste Land provides an excellent test subject for these notions of how literature functions under the direction of this different kind of reading. In *Hypertext 3.0*, George Landow specifically mentions *The Waste Land* as a "kind of pleasurable disorientation" (146) that "derives from what we have termed the content and not from the information technology that presents it" (146). Any heavily annotated or hypertext version of a literary work suggests a relation to reader-response criticism: as Iser contends, the reader co-creates the work by supplying that which is only implied. Each hypertext version of *The Waste Land*, in a way, exists as a unique combination of Eliot's work and the additions the creator of the interactive hypertext version makes, by what he decides to include and exclude, and how each separate reader decides to respond to the text and the "multilinearity, nodes, links, and networks" that exist within it (Landow 1).

In the print version, the primary function of the editorial footnotes North provides are to translate Eliot's use of other languages, and point out allusions that are specific enough so that not much debate exists concerning their clarity. Eliot's own notes are included in full, although they are subject to just as much of North's editing as the text of the poem (i.e. North creates notes for the notes). The hypertext version, in contrast, relies heavily on subjective inclusion as decided by the reader-creator of the online version; in the first few lines alone it provides links to Whitman's "When Lilacs Last in Door-yard Bloom'd" and the beginning of *The Canterbury Tales*, exhibiting connections less straightforwardly than the more objective annotations of the print edition; it allows the creator to take more subjective liberties, but at the same time, it

distances us even further from the author, and forces us to think about and understand the importance of the object read through the simulacrum of a distinct and consciously selective editor.

The endlessly allusive qualities of a hypertext version of Eliot's *Waste Land* do, however, allow one to experience the "heap of broken images" (Eliot 8) through a more non-linear mode of reading. We are no longer reading *The Waste Land*; we are reading a connected web of texts. One could begin reading the hypertext and spend days on end reading a variety of texts about a variety of subjects and soon forget the *Waste Land* itself. This interactivity, at times, makes it seem a different medium entirely, one that readers become lost in and soon are not readers of the *Waste Land* anymore; the object read has become ostensibly a host of objects read. Readers become immersed in a seemingly random amalgam of literary texts spanning a variety of time periods and genres. Thus, a hypertext reading keeps more of its value internal to that text when the plethora of outside sources and references reflect back on it, rather than branching out into a disordered web of references and allusions. For instance, the online version creates hypertext links between sixteen key linguistic motifs—words like "bones," "dead," and "water"—quickly and efficiently drawing connections within the poem itself and allowing one to examine it critically by reorganizing it in such a way that the immutability of a print version simply cannot.

To examine the elements of disparity between print and hypertext reading, I will now examine the poem's fourth part, "Death by Water" through two different modes: reading done by an annotated, print version, and through a hypertext reading. "Death by Water" is the shortest of the five sections of the *Waste Land*, and also one of the most straightforward. Thus a reader can discern how different these readings can be over just ten lines:

IV. Death by Water[5]

Phlebas the Phoenician, a fortnight dead,
Forgot the cry of gulls, and the deep sea swells,
And the profit and loss.
A current under sea
Picked his bones in whispers. As he rose and fell
He passed the stages of his age and youth
Entering the whirlpool.
Gentile or Jew
O you who turn the wheel and look to windward,
Consider Phlebas, who was once handsome and tall as you.

Eliot's only note for the section (the first line, specifically) reads as follows: "312. From St. Augustine's *Confessions* again. The collocation of these two representatives of eastern and western asceticism, as the culmination of this part of the poem, is not an accident" (Eliot 25). North's only footnote (indicated by the superscripted "5" above) says: "The exact significance of this section, which Pound insisted was 'an integral part of the poem,' has always been very difficult to determine, especially since it is, as Pound well knew, a close translation of the ending of "Dans le Restaurant" written in French by Eliot in 1918, before anything existed of the other four parts of the *Waste Land*" (16). Even before I begin, this information pressures me to consider this section as more removed from the other four, due to its connection with "Dans le Restaurant" and its connection with St. Augustine. I also connect "Phlebas the Phoenician" to the "drowned Phoenician Sailor" of Madame Sosostris' tarot card pack (a unique pack of Eliot's own devising, just another example of an authorial decision that further complicates the text itself) presented in "The Burial of the Dead." This is a connection an initial reader like Bishop would have undoubtedly picked up on. Despite these notes, reading the print version is a mostly linear act. I focus on the imagery of each stanza independently, the relevance of images such as the current that "picked his bones in whispers" to the overall themes of the poem. I notice once

again this bodiless voice of a narrator that directly speaks to the reader. It does make the reading experience more personal. In reading it rather straightforwardly, I feel emotions: recognition (in its connection to earlier sections, etc.), a slight bit of trepidation and fear in these graphic images of death and the inhospitable ocean swells. But, the poem still forces me to forego some of these emotions garnered by a perfectly linear experience: I think less about what is going to happen next than how this connects to what has happened before, how this particular line, this certain image fits into this assortment of nonlinear images; even in a linear form, Eliot's poem entices the reader to consider the text's meaning in a decidedly nonlinear fashion, despite one's best efforts to construct a sense of linear order around the poem.

Here is what the hypertext version looks like (at least the left side of the two split columns of the online site). The right side opens up the links, which allows me to keep the poem in front of me, even as I explore the intricate web of allusions and references that exist outside of the *Waste Land* itself.

> IV. Death by Water
>
> Phlebas the Phoenician, a fortnight dead,
> Forgot the cry of gulls, and the deep sea swells,
> And the profit and loss.
> A current under sea
> Picked his bones in whispers. As he rose and fell
> He passed the stages of his age and youth
> Entering the whirlpool.
> Gentile or Jew
> O you who turn the wheel and look to windward,
> Consider Phlebas, who was once handsome and tall as you.

One thing I do not do in the hypertext version, though, at least this far into the poem, is read the section from first line to last line, and then start exploring the links. I click on them (at least the ones about which I am curious) immediately. Clicking on the Roman numeral gives me

information similar to North's footnote. But the "Phlebas" link distances the reader greatly from the text of the poem itself: it provides a link to the Socratic dialogue "Philebus," from where (I assume) one could guess the name "Phlebas" is derived. This inclusion, however, (unlike most of North's footnotes), does not indicate a direct and allusive quotation. It is clearly a conscious decision of the site's editor. Clicking on "Phoenician" takes me back to the line about "the drowned Phoenician Sailor" (Eliot 47), a connection many careful readers would have undoubtedly made on their own. "Dead" and "bones" connect me to sortable links of images within the poem itself dealing with similar themes. This is perhaps the most useful aspect of the hypertext version: it allows the reader to sort and alter the order of the poem in order to make connections between images that are linked thematically, but not temporally, in order to derive additional meaning internal to the poem itself; this kind of linkage is radically different than that of the Socratic dialogue. But, by the time I have read these short ten lines, I have still already clicked on five links, reread parts of earlier sections, and connected the passage with others dealing with similar themes, just within the hypertext itself. But the possibilities are infinite: upon reading the first footnote, I could have located a translation of "Dans le Restaurant," looked up Eliot or the *Waste Land* on Wikipedia, or found more information on Tarot cards or Socratic dialogues in seconds. Sure, the *Waste Land* lends itself to this frenzied search for intertextual relationships amid a sea of allusions, references, and myths. If someone had asked me what I was reading, I would have surely responded with "Eliot's *Waste Land*," but at what point during that process do I cease to read the *Waste Land* and begin to read something else entirely?

In the end, reading the *Waste Land* in hypertext remains a valuable tool; it allows us to look at the text from angles we would not be able to without this technology. But it distances us from the original source of Eliot. The designer of this kind of hypertext does not just serve as an

editor; he is also the creator of a unique experience for the reader and a different way to examine the poem, a guiding intermediary between text and reader. This also acknowledges, as Barthes posits and Eliot himself would likely admit: *The Waste Land* is not the work of an individual author or an individual source. It both consists of planned links and open searches to other related content (which in turn have links, and so on, as we become continually more distanced from the poem). Steven Mailloux's early text on reader-response criticism, "Learning to Read: Interpretation and Reader-Response Criticism," acknowledges "that the reader's response is analogous to the story's action or conflict" (Murfin and Ray 425). The breaking up of these fragments, the endless ability to include or not include possible allusions and references is part of the beauty (and difficulty) of Eliot's text. It is a great way for one to understand more about the text, but should not be the only medium by which one approaches the *Waste Land*. Like anything else, there are tradeoffs here; we gain new insights in examining a text this way, but sacrifice a simpler method of examining the poem, one that is more central to knowledge of the workings of the poem itself.

Hypertext can all too easily further the possibilities of the "wild goose chase" Eliot discourages readers from undertaking (Whittier-Ferguson 9). A hypertext reading of the *Waste Land* ultimately provides a completely different and ultimately paradoxical reading experience, one that has its flaws. It conforms to one specific way of reading a poem, and as Carr suggested in the *Shallows*, as opposed to footnotes or endnotes, "links don't just point us to related or supplemental works; they propel us toward them. They encourage us to dip in and out of a series of texts rather than devote sustained attention to any one of them" (90). Thus, each hypertext construction is just one response on the "spectrum of possible responses to a perceived disparity between...[the] experience of the poem and the kind of experience that seemed to be suggested

by its notes" (Rainey 115). A hypertext reading tries to be like Rascoe's and Wilson's readings, but it ends up—for the average reader—generating an experience more like Bishop's: we go crazy trying to crack a code that doesn't exist, to center and stabilize a poem that is extremely unbalanced and volatile. It breaks apart and complicates an already complicated poem in an attempt to reduce its ambiguities and give finality and meaning to the text. As Eliot himself said, "the critic must not coerce, and he must not make judgments of worse or better. He must simply elucidate: the reader will form the correct judgment for himself" (Iser 18-19). We will never again be able to read the *Waste Land* without the influence of Eliot's critics (and Eliot himself) but hypertext, despite its interactivity, pushes the reader to make certain judgments about the poem and read it in a specific way. Bishop tried to treat the *Waste Land* text as an object; his pervasive and lingering feelings of shock came from his inability to mold an open text it into a linear object with direct and clear meaning. Despite their existences at seemingly opposite ends of the spectrum, Bishop's 'naked' reading and a hypertext reading do have similarities. Like Bishop's reading, it allows us, as we lose ourselves in a complex and open network of meaning. In the end, we can gain back some of that disorienting cognitive confusion and shock similar to what made Bishop's reading fully his unique construction.

The *Waste Land* hypertext used to explore the differences between a close reading and a hyper reading experience is admittedly a rather pedestrian hypertext construction. For my purposes, it functions as a clear example of the inherent differences between a close reading and a hyper reading of the same work of preexisting literature. But what about the growing body of literary works that have no print antecedents and use hypertext not just as a tool for understanding but as an element crucial to the structure and narrative of a story? Electronic literature "is computational and processural, dependent upon the operations of the machine for its

aesthetic effects […] a form that grows out of contemporary technologies, subjectivities, and aesthetics; some claim that it represents a definitive rupture from the past" (Pressman 2).

Perhaps no other hypertext is as lauded as Shelley Jackson's *Patchwork Girl* (1995). Part of a designated first generation of electronic literature, "comprised primarily of hypertexts, a genre of text-based narrative that promotes nonlinear, or more accurately, multi-linear, reading paths" (Pressman 8), *Patchwork Girl* represents a complex textual interface that preceded the "second generation" (10) of dynamic, image based hypertexts built in programs like Storyspace and HTML:

> Jackson's ambitious digital work takes as its premise that Mary Shelley's second monster, the female companion that Victorian Frankenstein began creating but then destroyed, was secretly finished by Mary Shelley herself. The artificial creature then becomes the lover of this fictional Mary Shelley, then travels to America, where she goes through numerous adventures until her death in the 1990s. Describing these events, Jackson frequently weaves quotations from *Frankenstein* into her account, creating a variegated patchwork of 'original' writing and borrowed phrases. (Clayton 137)

Patchwork Girl utilizes over three hundred screens of text, from single sentences to over three hundred words. The reader navigates the text through some 462 links. With no clear beginning or end, "the narrative core of the work is contained in two long sections:" "Journal" which contains Shelley's diary of her construction and early relationship with the monster, and "Story," which discusses their relationship from its point of view. "Flanking the narrative core, but interspersed during most reading experiences with the text, are three nonlinear sections" (Clayton 138) that deal with "meditations on hypertext writing, lyrical passages, dreams, irreverent remarks, and fragmentary musings in various voices" (138). One eerie section, "Graveyard," "gives voice to the creature's individual body parts […] sometimes forming tiny interpolated narratives, these passages literalize the poststructuralist dictum that the subject is always multiple" (138). *Patchwork Girl,* a

work of art in a textual mode that often encourages skimming and superficial reading, can seem daunting to readers unprepared for the focus and attention it requires of them. N. Katherine Hayles describes teaching Jackson's work alongside Shelley's *Frankenstein* to a group of college honors students. "They were shocked when I told them a reasonable time to spend with Jackson's text was about the time it would take them to read Frankenstein, about ten hours or so" (Hayles 77). Hayles notes that Jackson's use of the female monster itself (put together again from torn pieces of its own body) plays on "the idea of fragmentation as an inescapable condition not only for her narrator but for all humans" (78). Hayles recounts that her students, forced to use "already-existing print literacies" to read *Patchwork Girl*, were able to recognize that the complexities of hypertext required not skimming, but the reproduction of close reading methods to fully comprehend the nuances of the text (78).

As more hypertext experiments have been produced, several writers operating in the digital space have taken these concepts a step farther. One representative example is Judd Morrissey and Lori Talley's online narrative, *The Jew's Daughter*, loosely based off the "Ithaca" section of Joyce's *Ulysses*. It is a complex work that attempts to adapt the stream of consciousness of Modernist literature to the world of digital media. Morrissey's borrowing from Joyce can be seen as a purchase of "cultural capital from the literary canon in order to validate new aesthetics, promote traditional reading practices, and demand that this work be taken seriously" (Pressman 4). Whereas the principal component of hypertext—the link—allows us to connect separate texts in a nonlinear fashion, doing so requires a conscious act, most commonly accomplished through the click of a computer mouse. Despite its Modernist roots, hypertext cannot then wholly capture the technique of stream of consciousness; following a link is, at least

in theory, a deliberate act. Morrissey and Talley, however, circumvent this problem by creating a narrative that excludes the link entirely.

Once I enter the story itself it resembles the format of a traditional narrative: a rectangular block of black text on a white background. But there is no "next" button to use to turn between pages. Instead, the first "page" features one word, "criminal" in the blue of a hyperlink. Simply by scrolling over this, a large portion of the page's text has changed. Not all of it though. It is a completely different sensation from moving from static page to static page. Here, the text is fluid. In the "ergodic" precursors for hypertext, the movement through the text was conscious, but in *The Jew's Daughter*, the floodgates have been opened. A host of ever-shifting text moves through the static page, but there is no way to stop it, nowhere to go but where the story takes us as we click on the blued words, phrases, and symbols, ranging from "somnambulistic" and "city of parasites" to "it" and ")."[13]

The placement of the activating word/phrase/symbol appears on the screen, and the size of the block of text it changes help determine whether or not there is a need to reread the entire page again, or just reread the new section; there are no choices of links; I can move in no direction but forward But in how much to read, where to start on the page (at the top or where it changes), *The Jew's Daughter* gives me no choices of links; it forces me to control my own reading experience, in a way that often fills me with the same disorienting shock that the *Waste Land* gave Bishop a century ago. Its form clearly represents the stream-of-consciousness content, and at the most basic level, relays this stream of consciousness back to the reader in a more immersive way than a print work of literature could ever hope to. Hypertext links are, for most

[13] As well, scrolling over one of these activating words makes certain phrases such as "She had laid her head on the tracks and the train cut cleanly through her neck" appear letter by letter as it is seemingly typed onto the screen, drawing extra significance to it, the equivalent of underlining, bold, or italics to this Flash construction (Morrissey and Talley 137).

readers, now second nature. But here, the links only partially change what we see, a feature that is disorienting, but also so wholly new. It keeps the reader intrigued, and reading. It explores the possibilities of hypertext in a way that is worlds apart from a standard treatment of a preexisting work like *The Waste Land*.

FROM THEORY TO HYPOTHESIS:

A CONVERGENGE OF LITERARY AND SCIENTIFIC METHODS

On three consecutive days in February 2011, the popular and long-running game show, *Jeopardy!*, had an unusual contestant. Matched against Ken Jennings and Brad Rutter, the two most successful contestants in the show's history, was Watson, an IBM supercomputer that soundly defeated its competitors, nearly doubling their combined scores. During the show's filming, Watson was not connected to the Internet; its database of knowledge and question-answering algorithms were all stored within the computer system itself. Granted, Watson's feat remains only one example of machine power (both physically and intellectually) surpassing human ability. But Watson's (or rather, IBM's) accomplishment is a far more significant one than, for example, "Deep Blue," the IBM supercomputer that defeated world chess champion Garry Kasparov fourteen years earlier in 1997. Chess is a closed system with specific rules and parameters in which each move can be countered by a finite number of responses; it is a highly strategic game that naturally lends itself to algorithmic processes. Watson's victory, on the other hand, was not accomplished by mastering a closed system like chess, but rather through its ability to recognize the endless subtleties, nuances, and ambiguities of human language. According to its developers, "Watson understands natural language, breaking down the barrier between humans and machines" (IBM). It remains simply a manifestation of the increasing capacity for computers to parse language in the form of sentences, paragraphs, or even entire texts and to recognize and develop inherent patterns that exist within them, and generate responses of significance. The recent progress of this new kind of computer reading merits

examination alongside the multitudinous changes that have significantly changed the ways in which people interact with both print text and hypertext.

We have already seen that the ubiquity of digital media has shifted the way people read and study literature. In addition to the observations of writers like Nicholas Carr and Maryanne Wolf, who have documented recent developments in technology, which alter the way we interact with text on a neurological level, new media has opened up revolutionary and unique ways to analyze works of literature. Along with close reading and human-assisted computer reading, N. Katherine Hayles' three designations for different modes of reading include "human-assisted computer reading" (70). Also known as "machine reading" these terms represent a wide array of possibilities conceived from the nascent capabilities of quantitative data research now possible for a wide variety of functions, from the study of single web pages and texts to entire databases and even the majority of digitized human knowledge (70).

Unlike the relationship between machine reading and other modes of reading, there exists a clear dichotomy between close reading and hyper reading; they are often just two differentiated ways of reading, each possessing its own advantages and limitations. Machine reading, on the other hand, is a branch of the humanities still in its infancy; this third type of reading does not possess the easily identifiable and dichotomous relationship that exists between close and hyper readings. "In a field like literary studies, the efficacy, scope, and importance of machine reading are widely misunderstood" (Hayles 71).

Hayles classifies "human-assisted computer reading" as a wide range of practices that stem from "computer algorithms used to analyze patterns in large textual corpora where size makes human reading of the entirety impossible […which] ranges from algorithms for word frequency counts to more sophisticated programs that find and compare phrases, identify topic

clusters, and are capable of learning" (70). Scholars at the University of Washington who have initiated a project on the subject define machine reading more succinctly as "the automatic, unsupervised understanding of text," which sounds like a definition that could easily fit the likes of Watson (70). Their definition of text, however, does not mean a specific text (as in a single novel) but rather the ability to explore text in the expanded notion of the word recognized by modern theorists.

The concept of machine reading, in turn, exists as part of a larger academic focus: the digitization of the humanities. While one can perceive how the Modernists and those writing in their wake, like Borges, Cortázar, and Nabokov, created new fictions that anticipated the advent of hypertext literature, the possibilities of digital technology in the humanities were first demonstrated in the late 1940s by Jesuit priest Roberto Busa, who is "typically cited as the pioneer of the field of humanities computing" (Svensson). After receiving his doctorate from the Pontifical Gregorian University in Rome, Busa gained sponsorship from IBM founder Thomas Watson (the *Jeopardy!* winner's namesake) in 1949 to write computer software that would use linguistic analysis and information technology to produce a lemmatized index of the eleven million Latin words that comprise the complete works of Thomas Aquinas. The first printed volumes of the *Index Thomisticus* were published in 1974; it has subsequently been reproduced, not surprisingly, as both digital and online hypertext versions. As Patrik Svensson contends,

> In this foundational story, two important epistemic commitments of humanities computing are established: information technology as a tool and written texts as a primary object of study (for linguistic analysis). Commitments such as "computer as instrumental tool" and "text as object" end up helping decide what are legitimate types of questions and study objects for the field, and how work and relevant institutions are organized. (Svensson)

While the pioneering work of Busa helped direct the general focus of the Digital Humanities as the use of technology to study large sets of textual objects, the exponential increase in computing

power since that meeting between Busa and Watson in 1949 has opened up a world of new possibilities for the intersection of digital technology and academic study. And these possibilities are being recognized by more people than ever before. Despite the resistance of many humanities scholars around the world (particularly in literature departments), Hayles suggests, "a critical mass has been reached" (44). Vigorous Digital Humanities centers have recently been established at the University of Virginia, UCLA, UC Santa Barbara, the University of Maryland, the University of Nebraska, the University of Texas, and King's College London, among others. As well, there has been a "marked increase in the number of scholarly programs offering majors, graduate degrees, and certificate programs in the Digital Humanities, with a corresponding growth in the number of students involved in the field" (Hayles 44). The precipitous rise of these (mostly) collaborative efforts on a wide variety of topics have the possibility to greatly affect "the structures through which knowledge is created, contextualized, stored, accessed, and disseminated." (45).

Just as computer reading necessitates a separation into two separate groups—hyper reading and machine reading (although there is certainly an overlap between the two on many projects)—those on the forefront of the digital humanities recognize a distinct separation between the purposes of "assimilation and distinction" (46); as digital media influences how people create, organize, and eventually read print, our long history of books also affects how digital media is comprehended and studied. "Two dynamics are at work: one in which the Digital Humanities are moving forward to open up new areas of exploration, and another in which they are engaged in a recursive feedback loop with the Traditional Humanities" (32). Assimilation augments the long tradition of print-based scholarship online, whether through databases on specific authors or literary periods that systematically compile, organize, and augment

preexisting data (this was, undoubtedly, the vision of the *Index Thomisticus*). Most of these allow for easy hypertext navigation or machine searches that efficiently disseminate content to students and professional and amateur academics alike, and lend themselves most usefully to the development of patterns and networks for historical humanities research. Distinct Digital Humanities projects, therefore, consists of creative and critical endeavors that take advantage of the inherent vicissitude of digital media and attempt to bridge the gap between theory and practice. Much of this research utilizes an extensive variety of media, and thus inevitably distances itself from the traditional humanities; it contains an endless amount of cultural products and data through which to create more cultural products and data to be analyzed, and so on. But what is the relevance of projects that strive to use computer technology to discover new possibilities with traditional texts, not just through the assimilation of preexisting content into a machine-searchable environment, but in order to make new connections within texts or textual systems that did not exist before?

The Digital Humanities also face several challenges that set them apart from their more traditional counterparts. Three interrelated issues that will continue to influence the future direction of the digital humanities are scale, collaboration, and accessibility. With utilization of digital humanities on the rise, it is no surprise that "perhaps the single most important issue in effecting transformation is scale" (Hayles 27). More specifically, while machine reading may be used to expose complex patterns within a single text (as we will see with Franco Moretti's computer analysis of *Hamlet*), "its more customary use is in analyzing corpora too vast to be read by a single person" (72). The human capacity for reading has its boundaries. Even the most voracious reader can only read so much; if you finish a book a day for seventy-five years, you will have gone through a little over 27,000 volumes. While that sounds like a vast number,

digitized texts that "can be searched, analyzed, and correlated by machine algorithms number in the hundreds of thousands (now with Google books, a million and more)" (27). This does not even account for the human mind's inability to retain the majority of the content of those thousands of books. A computer can sift through millions of books in an instant, its capabilities only limited by the speed of processors and the size of memory storage available, a problem that continues to dissipate as the capacities of computer hardware expands at an exponential rate. "Even when hand searches are theoretically possible, the number and kinds of queries one can implement is exponentially greater than would be practical by hand" (Hayles 27).[14] From Busa's initial project to the most basic functions of human-assisted computer reading, from using a find tool to locate a specific sentence on a large page of text to starting a research project with a simple Google search, the most crucial functions of web reading are about making reading and research of any kind faster and more efficient. If hypertext reading, as I demonstrated in the previous section, generates the possibility of losing us in an endless network of references and related topics, machine reading is often the reader's trail of breadcrumbs through the endless forest of information found online, one that brings us back to where we are going or takes us somewhere entirely new instantaneously.

Scale is not only relevant in terms of what can be accomplished through computer-assisted human reading, but in terms of the large-scale nature of the projects implemented and the technology often needed in order to create meaning from the massive amount of machine-reading tools available to digital humanists. With the requisite technology, a task like a complex linguistic organization of the works of Aquinas can be accomplished in a very short of time. But

[14] It goes without saying that machine-programs do not have to devote any time to activities outside their tasks (as human readers do with basic functions like eating and sleeping).

these kinds of projects are also, due to the variety of creative and technical skills required, usually impossible to accomplish alone.

This coalesces with the second issue more crucial to the digital humanities than traditional liberal arts academic studies: collaboration. The Stanford Literary Lab models what it calls its "Big Humanities" focus (Hayles 34) on large-scale R&D projects in academic and private science centers. As the complexity of scientific projects has relied on the ultra-specialized skill sets of a diverse set of engineers, the wide variety of capabilities required for large-scale, more quantitative-based research projects necessitates a variety of people proficient in a wide range of tasks, from both creative, traditional humanities backgrounds and computer-based backgrounds. Large collaborative efforts have replaced—in most circumstances—the more romanticized concept of the lone genius, inventors and scientists like Edison and Einstein. Similarly, it is feasible to discern that many of our most significant contributions to the humanities will rely on the diverse skill sets of many individuals; many artistic projects (whether fundamentally critical or creative) will become less the fruits of people laboring primarily by themselves and more contributions from teams. This could necessitate a shift from solitary writing to creative writers who must communicate with and manage teams of programmers, unless, that is, the artists eventually become programmers themselves.

Will literature go the way of other media? Will writers be more like directors? The literary author more like the film *auteur*, where a style discernible across a director's body of works is still at the mercy of actors, filming equipment and special effects? Who is the true author of a digital creative project, the designer or the implementer, the artist or the computer scientist creating what appears online? The blurring of lines between media has begun to have a significant effect on literature. Notions of authorship are no longer just altered and complicated

by the ways the "multi-dimensional space in which a variety of writings, none of them original, blend and clash […] a tissue of quotations drawn from the innumerable centers of culture" (Barthes 146). Recently, even more so by the necessity of collaboration dictated by the structural components of the media through which people create art in our digital age.

These concomitant issues of scale and collaboration necessitate the mention of a third issue arising from the digital humanities: accessibility. Accessibility is perhaps the biggest problem that the increasing significance of machine reading poses to the future of literary and academic study and creation. Granted, large groups of people "working together within a shared framework of assumptions" can indeed contribute to and enrich content beyond what a single scholar or author is often capable (Hayles 36). And there are numerous programs available to anyone with Internet access that can be used to investigate texts through the lens of machine reading. Hayles lists several that are available free online, such as Wordle, RapidMiner, and the Hermetic Word Frequency counter, all which, in some capacity, help users organize, collocate, and draw patterns between groups of words or phrases across multiple sets of texts.

Those concerned about asymmetrical accessibility to computer reading (both hyper and machine) on a broad scale would likely meet staunch opposition from two of Adam Gopnik's three camps: the "Never-Betters" and the "Ever-Wasers" (Gopnik). The "Ever-Wasers" would likely point out that the asymmetrical availability of information has been a problem since the first developments of writing systems millennia ago. The unbalanced access to digital texts and tools is just a new form of a perpetual problem, the latest gap posed by the inevitable imbalance between the haves and the have-nots. The "Never-Betters" would then point out that Internet accessibility and literacy have increased precipitously over the last decade; Internet access across the globe has increased by more than 500% since 2000 (Internetworldstats.com) and illiteracy

rates have dropped steeply as well over the last several decades. Approximately 83% of the world can read and write on a basic level and 22% have regular computer access ("100 People: A World Portrait") While this still represents a large gap, trends suggest it will continue to shrink at an expeditious pace. Regardless, almost everyone actively engaged in the academic humanities has access to the Internet, and thus to most of the world's digitized information.

The quandary that accessibility most directly presents to computer reading and the digital humanities, however, exists on the forefront of digital technology. If you visualize worldwide access to information as a bell curve (with the illiterate on the far left, and literate people with basic access to technology in the middle), it is likely that the most uneven access to information exists on the far right side of the curve, with the select private corporations (such as Google, Apple, and Amazon) whose access to data and machine-reading capabilities to interpret this data dwarf that of even the most well-equipped humanities centers and academic institutions.

Even more concerning, this uneven access will likely increase as the worldwide information gap does the opposite. Just as the possession of money creates more money (this is how investment banks and hedge funds naturally extend the portion of the world's monetary wealth controlled by the richest of the rich), the profusion of data held by these companies naturally creates larger and more precise sets of data; the more of the world's information Google controls through both large-scale projects like Google Books (over twelve million) and through its vast wealth of user data, the more unbalanced this access to information becomes. It is feasible to suggest that no institution, corporation, much less an individual will ever have more information than Google. As they control more of the world's information, their search engine builds off the optimized data it already has to become increasingly accurate. Just as money makes more money, Google's wealth of data creates even more data at a seemingly exponential

rate; a small minority consistently controls more of the world's data, which poses alarming implications for the future of literature and literary study.

The wide array of possibilities presented by human-assisted computer reading are inherently useful, but along with the proponents of any new technological development, there will always be detractors; while Hayles focuses her argument on the effects of machine reading to specialized academic study, Nicholas Carr (as with his treatment of the technological affects on attention and close reading) discusses the advent of computer-based literary analysis with a focus on its large-scale, cultural consequences. While Carr acknowledges the paradox that the research his writing necessitates would have been next to impossible (or at least much more difficult and time consuming) without computerized searches, he—and many other writers—are troubled by the rising influence of human-assisted computer reading and the private entities that control their access. Carr's writing is certainly a bit tendentious at times, and his chapter in *The Shallows*, "The Church of Google," attempts to portray the company as almost cult-like. But Google remains an institution whose (sometimes) misguided mission has serious implications for the future of humanities scholarship.

Google's heritage is one inextricably bound to academia. While a graduate student at Stanford, Google cofounder Larry Page was fascinated by the explosive growth of the new computer network known as the World Wide Web. At the time, its a half million sites were being joined by "more than a hundred thousand new ones every month" *(The Shallows* 153). How to organize this complex and ever-changing body of information was of the utmost concern to computer scientists, engineers, and mathematicians. Page broke new ground by recognizing the corresponding relationship between hyperlinks and academic citations. "Both are signifiers of value" *(The Shallows* 153). When a scholarly article cites another academic paper, it

acknowledges the significance of that article; the more citations a paper receives, the more credibility it receives in its field. Likewise, when a web page links to another site, it essentially acknowledges that site's importance. "The value of any Web page, Page saw, could be gauged by the links coming to it" *(The Shallows* 153).

Page also observed a related analogy: "the authority of a Web page can be measured by how many incoming links it attracts. A page with a lot of incoming links has more authority than a page with only one or two. The greater the authority of a Web page, the greater the worth of its own outgoing links" *(The Shallows* 153). Similarly, being cited by an essay that has in turn been extensively cited is more valuable than receiving acknowledgement from an obscure source. Page realized "that the relative value of any Web page could be estimated through a mathematical analysis of two factors: the number of incoming links the page attracted and the authority of the sites that were the source of those links" (154). Page and his Google cofounder, Sergey Brin, then developed an algorithm that evaluated and determined the relative value of the entire Web. The world's most powerful search engine was modeled on academia, but now it has forever changed the workings of academia itself.

The company's boundless, even sometimes reckless, expansion has been hotly debated. Some of its major acquisitions, such as YouTube, have not been directly profitable, but simply enable Google to acquire more massive and varied amounts of data more quickly than their competitors. Writers like Carr worry that as Google's maxims of hierarchically organizing and classifying the world's information converge with its goals of universal accessibility to this information, Google's obsession with quantitative, computerized efficiency will exercise more control over our intellectual lives.

The Google Book initiative, the company's "effort to digitize all the books ever printed and make their text 'discoverable and searchable online'" has, more than any other program, the ability to profoundly influence the trajectory of literary study (Carr 161). Publishers McGraw-Hill and Houghton Mifflin, university presses at Cambridge and Princeton, and several of the world's most prestigious libraries, including the New York Public Library and Oxford's Bodleian, all gave Google access to scan their library stacks and archives. Detractors to the project, on the other hand, denounced what they called Google's brazen violation of copyright laws; they only remove a violating tome if its owner submitted a formal request for its removal. After agreeing to pay out $125 million to compensate the owners of its already-scanned volumes, Google incorporated a payment plan giving authors and publishers a share of advertising revenues from their Book Search service in return for permission to continue their program. The transcript of their settlement concluded with a recognition of Google's authorization to "sell individual Books, place advertisements on Online Book Pages, and make other commercial uses of Books" (Carr 163).

The settlement's conditions not only seemed to give Google a large control over digitized versions of books owned by some of the most significant publishers, press, and libraries, but also over countless "so-called orphan books—those whose copyright owners are unknown or can't be found" (163).[15] Connecting this initiative to Google's tenets of output maximization and efficiency, an American Library Association court filing proposed that Google could eventually "set the price of subscription at a profit-maximizing point beyond the reach of many libraries" (retrieved from Carr 163). Despite Google's supposedly magnanimous intentions, many feared

[15] Google contends that anyone is capable of this digitization of books, but the technological and financial resources available to them make this unfeasible for all but a few other corporations, at least on a similar scale.

that a for-profit company controlling a monopoly, not of a physical good or service, but of information and knowledge, was quite disconcerting.

This pressure has forced Google to slightly scale back the size of these ambitions in the last few years, but the debate reveals inherent problems for the future flow of information. First, copyright laws still have much progress to be made in terms of their application to our digital age; despite many Internet activists calls for all information to be available in the public domain, the public domain itself is still inevitably controlled by the search engines and web browsers used to navigate it. Also, there will certainly be a point where nearly all of the world's books, essays, poems, articles, etc. will be digitized, and this point will likely occur sooner rather than later. This has already led to numerous avenues for research hereto unavailable, as well as the development (as I will soon show) of some incredible machine reading projects. "The argument about Google Book Search has nothing to do with the wisdom of scanning printed books into a database; it has to do with the control and commercialization of that database" (164).

Google's inevitable dominion over these countless scanned images that represent a large part of the collected knowledge of human history has notable side effects outside of the realm of the legality of copyrights and monopolies; the drawbacks of this inherent "unbinding of the book" (165) seem lost to Google in the face of their ultimate goals of efficiency and desire to expedite the reading experience. If we accept the evidence that the non-linear hyper-reading of a text constitutes an experience quite neurologically different from a linear close reading, it is concerning that, as libraries around the world become increasingly digitally-based, a vast majority of text will only be available online, only be accessible through one mode of reading. Multitextual reading is still a crucial skill for our digital information age, but things like the Google Books Project could eventually turn all reading into hyper-reading, replacing lengthy

works of literature that have required deep, sustained, concentrated thought with their online doppelgangers. This does not only mean hyperlinks and searchability: “Google wants us, it says, to be able to ‘slice and dice’ the contents of the digitized books we discover, to do all the “linking, sharing, and aggregating” that are routine with Web content but that ‘you can’t easily do with physical books” (165); it all but encourages the breakdown of cohesive works into morsels of meaning: phrases, quotes, and word clouds.

“Explore a book in 10 seconds” (Puppin), is the title of a blog post written by one of Google’s engineers about the company’s aspirations. This is different from models like the hypertext *Waste Land* that utilize non-linear methods of examining a work to reveal meaning that exists outside of the text itself. Rather, Google ascertains that the inherent value of a literary work is not in its complexities and ambiguities, but in an assemblage of data to be parsed into objective, easily identifiable bits of meaning. Carr quotes a keynote address given by Page at the American Association for the Advancement of Science, in which he likens human DNA to “600 megabytes compressed” (172), less than most current PC operating systems. He also mentions Google executive Marissa Mayer’s (the current CEO of Yahoo!) belief in examining patterns in massive amounts of user data to determine the “right” (151) solution for subjective and aesthetic decisions such as the colors and layouts of their web pages. Google’s (and the majority of the Internet culture’s) focus on expediency and access expends all of their energy making content available, and none facilitating our ability to truly understand it, at least in a subjective, fully human capacity.

This issue of accessibility not only shapes the way we read and interact with literature; the prodigious amount of data available to companies like Google and Amazon also has the ability to profoundly influence the creation of literature itself. One particularly surprising, even

counterintuitive consequence is that as more information becomes more easily accessible on the web, a smaller range of sources makes up a more significant portion of academic citations; Google's search engines, modeled on academic citations, have profoundly influenced these citations, and resulted in a large body of more homogenous research, despite the unprecedented wealth of information available. The University of Chicago's James A. Evans investigates this phenomenon in a 2008 *Science* article entitled "Electronic Publication and the Narrowing of Science and Scholarship." Evans' article rebukes the consensus of his peers that "'digital libraries' and 'information technology'" are wholly superior mechanisms of academic research (Evans 395).

Utilizing a database of over thirty million articles across the majority of academic disciplines published between 1945 and 2005 and copied online between 1998 and 2005, Evans discovered that as more issues and journals were made accessible online, those cited tended to be more recent, and from a smaller range of publications, which in turn cited a smaller range of publications themselves. As search engines hierarchically sort academic research by the frequency and significance of their citations, they inadvertently lead scholars to the same articles. In short, efficiency has led to homogeneity. The inherent inaccuracies of indexing and cataloging print articles, which compelled researchers to search through seemingly unrelated articles, "may have facilitated broader comparisons and led researchers into the past" (398). Evans suggests that this is just the next logical shift in research from a "contextualized monograph" like Newton's *Principia* or Darwin's *Origin of Species* to a contemporary, specialized research publication (398).

> By enabling scientists to quickly reach and converge with prevailing opinion, electronic journals hasten scientific consensus. But haste may cost more than the subscription to an online archive: Findings and ideas that do not become consensus quickly will be forgotten quickly […] 21st-century scientists and

> scholars use online searching and hyperlinking to frame and publish their arguments more efficiently, they weave them into a more focused—and more narrow—past and present. (398)

We reinforce these tendencies toward homogeneity every time we use the solicitous suggestions of search engines or watch a YouTube video that has gone "viral." While Google's Autocomplete feature, for instance, helps reduce inaccurate searches through typos and speeds up routine searches, it also greatly influences the research experience. They "tend to serve as amplifiers of popularity, quickly establishing and then continually reinforcing a consensus about what information is important and what isn't" *(The Shallows* 217). For instance, a Yahoo! search for "Hamlet and" prompts a dropdown list that suggests the add-ons of Ophelia, Gertrude, the Lion King, Laertes, Oedipus, revenge, Macbeth, his problems, and death. Although it is doubtful that our most erudite Shakespeare scholars rely on these rudimentary Google searches in their analyses, how many high school and college students who actually attempt to research their topics end up producing strikingly similar papers that do nothing but reinforce widely-held beliefs about the play? The concept of going viral does not just affect the world of Internet videos of kittens and sports bloopers it seems; the algorithmic "scripts" on search engines as well book and movie recommendations on sites like Amazon and Netflix give us an unprecedented freedom of media exploration, but also "mechanize the messy processes of intellectual exploration" (218). Too often it seems, we relinquish our desire for discovery to massive data sets that dictate, and then perpetuate popular opinion.

The increasing influence of machine-reading algorithms does not end there. The popularization of long-form reading on digital platforms—computer screens, tablets, e-readers, and smartphones—has also created a conglomeration of data useful not only to corporations like Google that accumulate myriad data on preexisting works, but also to institutions (like publishers

and literary agents) that actually create literature. A July 2012 feature article in the *Wall Street Journal*, "Your E-Book is Reading You," describes how, as people read on a digital device, they not only absorb information from what they're reading, the device simultaneously attains information about them as well.

For centuries, reading has become an increasingly solitary, silent, and private experience, a simple two-way exchange between reader and text. While hypertext reading clearly disrupts this linear relationship, it is not the only cause: "the rise of digital books has prompted a profound shift in the way we read, transforming the activity into something measurable and quasi-public" (Alter). While TV producers and movie studios have long tested and altered shows and films based on viewers reactions, publishing has seemingly remained a bastion of purity and independence from these practices. Amazon, Apple, Google, and Barnes & Noble have recently caught up to the rest of the arts and entertainment industry as they collect data and use analytics programs to make decisions based off readers' choices and habits: how long it takes the average reader to finish, *Mockingjay*, the final book in the "Hunger Games" trilogy (seven hours), which passages readers most often highlight (a line from *Mockingjay*, followed by the opening line of *Pride and Prejudice*), and the fact that readers of popular series like "Fifty Shades of Grey" "tend to tear through all the books in a series"[16] while readers of literary fiction and nonfiction skip around and read in short bursts. Barnes & Noble executives divulge, "the company is starting to share their insights with publishers to help them create books that better hold people's attention" (Alter). As well, "pinpointing the moment when readers get bored could also help

[16] This is not unlike the binge television watchers who have replaced the channel-surfing couch potatoes, as marathon viewing sessions of serial TV shows like *Breaking Bad* and *Game of Thrones* popularized by streaming services like Netflix and HBO GO. Similarly, these sites utilize their own algorithms for everything from show recommendations to encouraging viewers to watch the next episode of a serialized show (Jurgensen).

publishers create splashier digital editions by adding a video, a Web link or other multimedia features" (Alter). This would clearly represent another step in the direction towards total media convergence, as videos or links help cure the supposed boredom caused by reading print text.

To many, this data-driven approach is an ethical issue of personal privacy. But not unlike its influence on academic publications, this human-assisted computer reading exclusively accessible to a select few corporations could also result in larger body of conforming, homogenous literature; do not be surprised if romance-novel fans start noticing an uptick in the number of thirty-something male love interests with black hair, green eyes, and an European accent (this is what digital publisher Coliloquy's data suggests constitutes the genre's perfect male love interest). Some publishers are even testing books in an online-only setting before deciding whether to release a print edition. Some are even considering a return to the serial publishing pervasive in the age of Dickens. Data gleaned from the renewed popularity of choose-your-own-adventure novels—a precursor to hypertext—gleans data that influences the plots of later books in each series. Jonathan Galassi, president of Farrar, Straus & Giroux rejects this idea: "The thing about a book is that it can be eccentric, it can be the length it needs to be, and that is something the reader shouldn't have anything to do with […] We're not going to shorten *War & Peace* because someone didn't finish it" (Alter).

Granted, a lot of this data is much more applicable to formulaic, genre-based literature. But why would this technology not eventually be used to alter ambitious and experimental works of literature? As more of this data is gathered, publishers and digital booksellers will surely be able to draw connections between the most esteemed works of our literary tradition, and mold the most earnest works of literature in their images:

> As Gregory Crane observes, machine queries enable one to get a sense of the background conventions against which memorable literary works emerge.

> Remarkable works endure in part because they complicate, modify, extend, and subvert conventions, rising above the mundane works that surrounded them in their original contexts. (Hayles 28)

In this case, would the negative implications of this new wealth of literary data not be softened by the availability of symmetrical information? Instead of this data only being made available to a select few corporations, its availability to literary storytellers, novelists, and poets could enable them to consciously engage with, and then either adhere to or subvert the broad literary tradition of conventions and assumptions rather than just creating predictable, similar works that adhere to formulas for mediocre success.

Despite the troublesome nature of many facets of this intersection between large-scale sets of corporate machine-reading algorithms and data, these algorithms have resulted in groundbreaking machine-reading academic projects, even if on a much smaller scale, which possess the ability to function cohesively with close reading and hyper reading projects. The creation of procedures and practices that combine close reading and quantitative analysis of literature opens new possibilities that academic Stephen Ramsay calls “algorithmic criticism” (Hayles 31). Ramsay argues that the valuation of computer analyses solely for objectivity “forsakes the rich traditions of humanistic inquiry that have developed sophisticated and nuanced appreciation for ambiguities” (31). Computer analysis should not, he argues, focus on solving textual problems as much as creating new ones: unrecognized, ambiguous patterns and connections that open up new possibilities for literary theory. “If algorithmic criticism is to have a central hermeneutical tenet, it is this: that the narrowing constraints of computational logic – the irreducible tendency of the computer toward enumeration, measurement, and verification – are fully compatible with the goals of criticism” (Ramsay 11-12).

Does human-assisted computer reading retain its meaning when it hones in on an individual text? Can machine reading (at least in its current state) draw relevant conclusions from the varied and nuanced Empsonian ambiguities of a text? Is it just another perspective—one in a long line of critical perspectives and methods—from which to scrutinize and destabilize a text? Possibly, but algorithmic criticism nonetheless has a greater possibility to influence and alter all these perspectives through its ability to recognize patterns outside the limits of human consciousness and influence a variety of ways of reading and a multitude of critical modes.

The primary function of this critical overlap between computer-assisted human reading and human-assisted computer reading manifests itself in the identification and development of patterns. A reader can accomplish this overlap while executing, say, a Google keyword, when one realizes that a certain author has already written extensively on a topic of interest, or through a computer analysis to confirm a pattern already discerned through hyper or close reading. "Indeed, skimming, scanning, and pattern identification are likely to occur in all three reading strategies; their prevalence in one or another is a matter of scale and emphasis rather than a clear-cut boundary" (Hayles 73). Linguistic patterns of word uses and imagery in fiction can be discerned through a conscientious close reading or through a hyper reading of a single novel or a multitude of related texts. Patterns in massive sets of data, however, may only be identifiable by a refined computer analysis.

Although Foucault's claim that the "'frontiers of a book are never clear-cut, because 'it is caught up in a system of references, to other books, other texts, other sentences, it is a node within a network'" (Landow 2) applies literally to textual networks (hypertext), one can also apply this observation to visual networks (algorithmic data outputs). One of the most important figures at the forefront of these visual network creations is Lev Manovich. His groundbreaking

"The Language of New Media" (2001) details the cultural implications of our society's emphatic shift to digital media, placing it firmly within the histories of our visual-oriented culture of the last few centuries. His report on a series of his more recent projects, collectively titled "Cultural Analytics" (2007), begins by posing several interesting questions:

> Can we create **quantitative measures** of cultural innovation? Can we have **a real-time detailed map** of global cultural production and consumption? Can we **visualize flows** of cultural ideas, images, and trends? Can we visually represent how cultural and lifestyle preferences – whether for music, forms, designs, or products – **gradually change over time**? (Manovich 1)

He argues that the visualization of data that agencies of science, business, and government rely on (often in real time) should be applied to cultural and humanities data. The aforementioned scanning of books by Google (as well as by museums and libraries across the country) has made this data available to cultural and literary professionals.[17] His ambitions are large: analyzing data sets of multiple terabytes. His writing, at times, takes the form of an instructive manifesto for academia: "visualizations should provide rich information presented in different formats, i.e., graphics, text, numbers, time graphs, etc. This information will be placed in larger contexts – for instance, geo maps overlaid with economical, sociological and/or historical data" (1-2). He pushes not just for the assimilation of historical data, but for current, real-time data sets providing a "situational awareness of cultural data" (3). Imagine the real-time cultural updates of a Twitter feed: showing large-scale patterns and trends among groups or their entire database, but on an even more massive, and more visual scale. It, in short, turns information into aesthetic, words into visual art.

[17] Then should we refer to Manovich as not a cultural commentator, but a "cultural analyst?"

Take for instance this work by Columbia University's Bradford Paley, first published in *Nature* magazine in 2006, updated here in 2010:

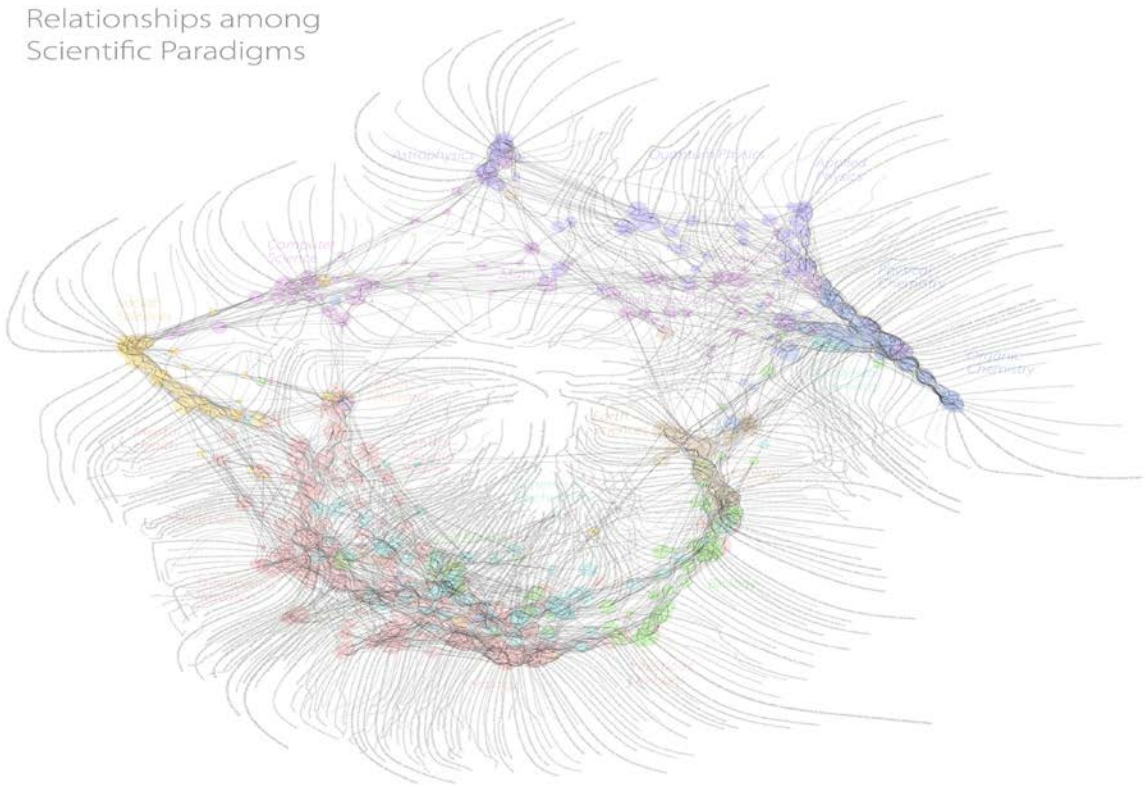

Image retrieved from http://www.wbpaley.com (accessed April 2013)

Here is what a close-up of the visualization project looks like:

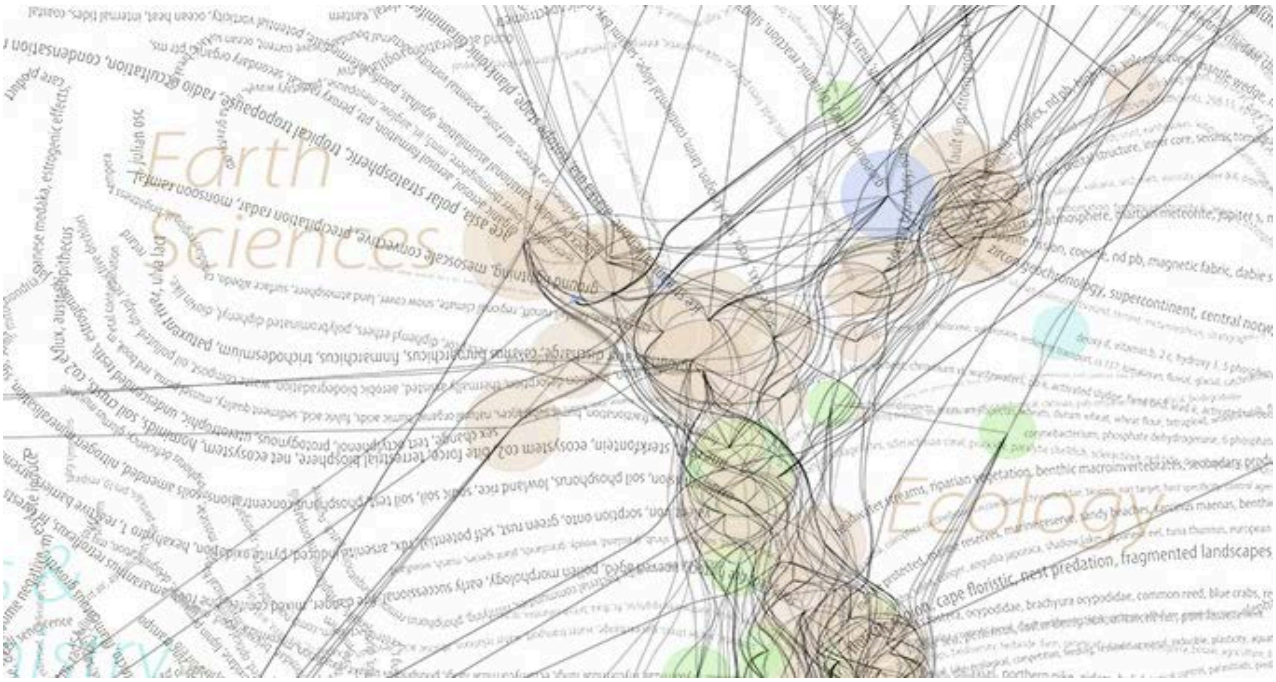

Image retrieved from http://www.wbpaley.com (accessed April 2013)

The type of real-time, real-world visualizations of data Manovich designates as the most valuable to cultural studies are being built by companies such as Vislogix and Imaginary Forces at universities, museums, and corporate offices all around the world. Here at Vanderbilt, we are exposed to the effects of visualization of computer-read data every time we enter the campus' main library.

The installation below uses real-time search data retrieved from computers across the Vanderbilt library system to create a word cloud that changes periodically into three symbols of Vanderbilt (the V, oak leaf, and star):

Image retrieved from http://www.insidevandy.com

Manovich encourages those active in the digital humanities to make "compelling visualizations" (10) out of current, mutable data and not just focus on the past. He concludes his brief essay by encouraging people to approach culture with the same "big data" mindset that people in more traditionally quantitative disciplines possess, and to "focus on current cultural data, with historical data acting as a support for the present" (11). But what significance do these real-time visual data sets actually contain? Certainly, they give us a window into the present at a scale much larger and at a speed much faster than could be accomplished with only human cognition. And, yes, these visuals are aesthetically appealing and fundamentally interesting.

But does a fixation on the present increase a project's significance or does it devalue it by placing it within the inherent superficiality of immediacy? The data is relevant, but only for a moment. As David M. Levy remarks, more data is now "available to us than ever before, but there is less time to make use of it with any depth of reflection" (*The Shallows*, 170). Subordinating data about the past to the will of the present misses out on understanding the movements and trends that have led to the present, and can thus help predict and determine the future trajectories of art and literature. As Faulkner famously declared, "the past isn't dead. It isn't even past" (Faulkner 1.3). Computer-assisted human reading can discover and rediscover elements of the past that can significantly alter our understanding of the present.

The Stanford Literary Lab—founded in 2010 by Franco Moretti and Matthew Jockers—combines an understanding of "big humanities" data on our entire literature tradition, from an individual text (*Hamlet*) to a body of texts (the British novel), to draw conjectures about our literary past, on a level impossible for a human reader to undertake. Franco Moretti, rather than using the term "human-assisted computer reading," designates his method of inquiry "distant reading," in direct contrast to the hermeneutic close reading that has pervaded literary study since its inception. "Distance is however not an obstacle, but a specific form of knowledge: fewer elements, hence a sharper sense of their overall interconnection. Shapes, relations, structures. Forms. Models" (*Graphs, Maps, Trees* 1). In an earlier work, he offers a vision for the future understanding of our canon and beyond it: "Literary history will quickly become very different from what it is now: it will become 'second hand': a patchwork of other people's research, without a single direct textual reading" ("Conjectures on World Literature"). His term groups human reading and human-assisted computer reading together; for him, distant reading is simply a matter of scale (one with computers facilitating human reading, the other with people

facilitating computer reading). It represents a way of juxtaposing large bodies of texts and discerning both their inherent patterns and their disjunct elements. In a way, this seems to reverse the trends of critical theory over the latter half of the twentieth century; there has been a shift from the desire to destabilize an individual text (e.g., post-structural thought) to the ability to stabilize large bodies of texts by discovering new patterns between, say, popular novels and the canonical texts that subvert and transcend their patterns.

One of Moretti's papers, "Style, Inc.: Reflections on Seven Thousand Titles (British Novels, 1740-1850)," draws large-scale conclusions about changes and patterns within the textual system of the British novel during this important period for its development. "The major metamorphosis of eighteenth-century titles is simple: in the space of two generations they become much, much shorter" (Style, Inc. 136). In this one-hundred-and-ten year period, the average length drops from fifteen or twenty to six. The titles also become much more similar to one another; as shorter titles using five or ten words were becoming more commonplace, there were still plenty of titles with upwards of twenty, even thirty words. Eventually, however, this standard deviation shrinks and the titles become more similar in both length and style. Early novels in the data set (1740s-1750s) featured titles that gave a summary of the plot, such as:

> *A letter from H—g—g, Esq; One of the Gentlemen of the Bedchamber to the Young Chevalier, And the Only Person of his Retinue that attended him from Avignon, in his late Journey through Germany, and else- where; Containing Many remarkable and Affecting Occurrences which hap- pened to the P— during the course of his mysterious Progress. To a Particular Friend.* (139)

This sounds bizarre to us, but according to Moretti's research, it was quite useful for helping people quickly understand the major elements of the narrative that followed it. But as the number of novels written and published rose dramatically over time, newspapers and magazine reviews of titles made these lengthy titles somewhat superfluous. As well, more titles meant more

choices, and people wanted titles with more immediate appeal. *Pride and Prejudice* or *A Tale of Two Cities* admittedly seem more intriguing than the long title shown above. Moretti is even able to use his data to designate these short titles into three categories: proper names (*Octavia*, *Oliver Twist*), article-noun/article-adjective noun (*The Smuggler*; *The Tuscan Vase*), and abstractions (*Fatality*, *Great Expectations*). Although these patterns would likely be discernible on a basic level by just observing a list of some of the canonical British novels of the period, this new type of literary model does indeed efficiently answer large-scale questions, even if some of his observations might have alternate explanations For instance, I find it likely that the contraction of the standard deviation of title lengths might have more to do with the larger amount of titles published smoothing out his data than the conscious shift he suggests. In a *New York Times* article on Moretti's "distant reading," journalist Kathryn Schulz sums it up well: "When the explanations fail to persuade (as Moretti candidly confesses is sometimes the case even for him), the patterns nevertheless stand revealed as entry points for interpretations advanced by other scholars who find them interesting" (Schulz).

Moretti's use of distant reading, however, also "allows you to focus on units that are *much smaller* or much larger than the text" ("Conjectures on World Literature," emphasis added). What happens, then, when distant reading attempts to break down a text to a smaller level than is available with close reading? The 2011 Stanford Literary Lab pamphlet, "Network Theory, Plot Analysis" desires to "quantify plot" (Network Theory, Plot Analysis 11); Moretti designs a contained network for *Hamlet*, "made of vertices and edges; a plot, of characters and actions: characters will be the vertices of the network, interactions the edges" (3). The network links two characters if they interact via a speech act. This method is almost the opposite of hypertext: instead of examining a text as part of an infinite web of signs and signifiers that exists

outside of the text itself, this analysis of *Hamlet* intends to expose an elaborate network within the text itself. Moretti's model is simultaneously a reduction and an enlargement of the text:

> [a] consequence of this approach: once you make a network of a play, you stop working on the play proper, and work on a model instead: you reduce the text to characters and interactions, abstract them from everything else, and this process of reduction and abstraction makes the model obviously much less than the original object – just think of this: I am discussing Hamlet, and saying nothing about Shakespeare's words – but also, in another sense, much more than it, because a model allows you to see the underlying structures of a complex object. (4)

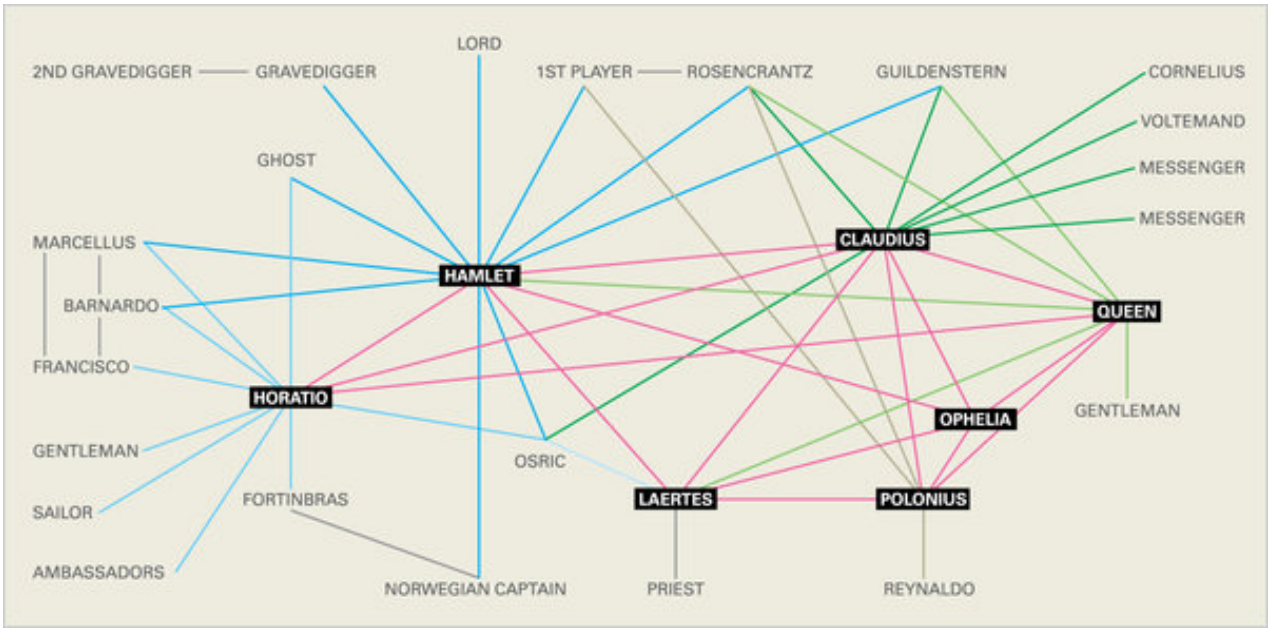

Illustration by Joon Mo Kang (Source: Stanford Literary Lab). Retrieved from the *New York Times*.

Moretti concedes that the limits of human-assisted computer reading become apparent (at least with current technology) at this level of analysis. He notes that "the essay drifted from quantification to the qualitative analysis of the plot" (11). Kathryn Schultz admits her reading of Moretti's report "vacillated between two reactions: 'Huh?' and 'Duh!' – sometimes in response to a single sentence" (Schultz). For instance, Moretti's borrowing a colleague's definition of protagonist as "the character that minimized the sum of the distances to all other vertices"

("Network Theory, Plot Analysis" 4) initially sounds confusing. So this means, "'the center of the network.' So guess who's the protagonist of *Hamlet*? Right: Hamlet" (Schultz). Moretti's model does, however, have some unique features, such as creating a network theory where Hamlet himself is absent. At that point, however, is Moretti even analyzing *Hamlet* any more, or something entirely different? It's almost like studying the brushstrokes of a painting or the frames of a movie at a level indiscernible through human cognition. It is one thing to objectively discern patterns (such as title length among a set of novels and the rise of a literary form in different countries), but applying this method to a single novel, story, poem, or play is a different beast entirely. Moretti's enthusiasm to apply quantitative research is even seen by some academics as a desperate attempt to prove the value of the humanities in the face of the rising students focused on scientific and vocationally-oriented programs: "what counts as knowledge is equated with a piling up of data and graphs, questionnaires and pie charts, input-output ratios and feedback loops" (Felski 2). This kind of focus might not be commonplace in the humanities, but if trends continue, it soon will be.

That such a subjective, human (the humanities, after all) mode of thought could "take a backseat to algorithmic processes" (Hayles 30) is at the least unsettling. With the proliferation of these big data sets and the possibilities of interacting with text distantly and indirectly, do we reach a point where the conversation about the text ends up dwarfing the text itself? It's very possibility. Many scholars, for instance, have commented on the chasm that exists between "Shakespeare" as cultural object and Shakespeare as the poet, playwright, and man who lived from 1564-1616. Is a distant reading (although it seems more at times like an extremely close reading) of *Hamlet* so removed from the text itself that it becomes meaningless? Or does it provide analysis that could otherwise be impossible? Does it turn art into data? Or does it just

use data to reveal more about art? Is this kind of study of a work so distant from the work of art itself that we end up studying something entirely different? We have already examined the concerns of the complex relationships between reading, digital technology, and the human mind. In a way, this concern dwarfs that one; it takes literary studies into decidedly unhuman territories. IBM's Watson was undoubtedly just the beginning.

But there are certainly benefits, if at times the technology is misguided. Moretti should, for one, be lauded for acknowledging the experimental nature of his work. The concept of reading and its purposes has changed drastically since its prehistoric inceptions. This is a new type of reading that is inherently useful, and thus an adept "multitextual" reader must be able to practice it. And while the history of world literature may be understood (on some level) "without a single direct textual reading" that meaning is irrelevant alongside close readings of texts significant to that history ("Conjectures on World Literature"). As Carr's concern with brain plasticity ignored the paradox that without brain plasticity, our brains would never have been able to become proficient at the unnatural act of close reading in the first place, many of the detractors of the digital humanities and its use of human-assisted computer reading forget one essential fact: that the connection between machine reading patterns and literary meaning must still be supplied by the human close reading of this data (the Hamlet diagram is meaningless unless read by people who have read *Hamlet*).

"Now it is time to rethink what reading is and how it works in the rich mixtures of words and images, sounds and animations, graphics and letters that constitute the environments of twenty-first century literacies" (Hayles 79). Students of literature must now not only be able to read complex literary works to discern meaning but relate complex data sets to these works in order to illuminate even more meaning; they must be full-fledged multitextual readers.

I HAIL THE SUPERHUMAN:

CONCLUSIONS

Ever since the first prehistoric humans used simple stones to help them cut plants and chop through wood, we have used tools to aid us in our tasks. Every technological development, no matter how integral to our understanding of the world, will have its detractors. For instance, anthropologist Jared Diamond "considers agriculture to be not just a setback but 'the worst mistake in the history of the human race,' the origin of 'the gross societal and sexual inequality, the disease and despotism, that curse our existence'" (Batuman). In many ways, the digital revolution constitutes a shift as significant as the change from hunter-gatherer to agricultural societies, the transformation of oral cultures to writing-based ones, the invention of the printing press, or even the industrialization and urbanization of our world; it has led to an unprecedented increase in the rate at which we can disseminate information not seen (at least the printing press), and it allows us to communicate with one another, regardless of geographic boundaries, at a rate much faster than even the most significant improvements to travel have brought.

These do not mean that the way digital technology alters and changes how we undertake the decidedly human activity of reading (the definition of which, I have shown, has expanded rapidly). Similarly, however, Katherine Hayles posits, "'human' is not a fixed concept but a construction constantly under challenge and revision […and] should be understood contextually as part of a long history of the 'human' adapting to new technological possibilities and affordances" (30). Humans and our tools and inventions exist symbiotically as we constantly alter each other.

As Yeats says in “Byzantium:” “I hail the superhuman” (15). I have to agree. Many of the world’s artificial intelligences function in ways far superior to that of the human. The capabilities of digital technologies, in a broader sense, far outweigh their consequences: from the digital mapping of the human genome (which has given us insight into the way diseases function at a molecular level and how to treat them) to the availability of news from the any part of the world instantly. In one form or another, literature will survive this change, but like the fluid concept of humanity, our idea of literature might need to undergo revisions (or at least expansions) as well.

Marshall McLuhan’s claim that “the medium is the message” (5) sounds like a warning, but is actually more of an attempt to help us understand how media should be used (the title, after all, is *Understanding Media*).

> Language, like currency acts as a store of perception and as a transmitter of the perceptions and experiences of one person or one generation to another. As both a translator and storehouse of experience, language is, in addition, a reducer and distorter of experience. The very great advantage of accelerating the learning process, and of making possible the transmission of knowledge and insight across time and space, easily overrides the advantages and disadvantages of linguistic codifications of experience. (McLuhan 51-52)

This “great advantage of accelerating the learning process,” however, also has its drawbacks. The transition from an oral to a written culture developed slowly, and people like Socrates had a lifetime to understand both what these technological advancements give us, and also what they take away. Today’s technological advancements naturally happen much more quickly; as I said in my introduction, the computing power people now carry in their pockets dwarfs the capacity an entire room of tangled wires and servers held fifty years ago. We live in a culture of immediacy, where nothing is submitted to “the wise ear of Time […] Inundated at every moment by information of immediate interest, we have little choice but to resort to automated filters, which grant their privilege, instantaneously, to the new and popular. On the Net, the winds of

opinion have become a whirlwind" (Carr 171).[18] Before we can even begin to understand the neuroscientific consequences of digital reading, devices that allow us to do so (among countless other things) have been put in everyone's pockets. Just as our concept of humanity is constantly under revision, so too must we revise and alter the understanding of our relationships with technology, and constantly question and study its effects on our minds and our society.

Many of the major issues raised in this thesis—the radically different ways our brain functions when reading print and online texts, the superficial and distant reading which does not necessitate direct human interaction with art, and Google's influence on producing homogeneous citations and search results—have one thing in common: they are all—to an extent—preventable, as long as people are made aware of them, and as long as new technologies are not just automatically assumed to be improvements.

Close reading is a valuable skill that we must not lose. Computers can never read a text and experience the same shock John Peale Bishop did, the same overwhelming sense of emotion that remind us of what it is to be human. As Jonathan Culler notes, "we cannot just take close reading for granted, especially as we welcome in the university a generation of students raised in instant messaging and in an age where new electronic resources make it possible to do literary research without reading at all" (Pressman 27). This same digital technology that affects the ways we read can also give us valuable insights to what happens in our brain when we read, and let us know how to do so more effectively.

While hyper reading allows us to draw connections and absorb a variety of content in a non-linear fashion, we must give ourselves time to process information, time to understand it, so

[18] The idea of a work of literature like *Moby Dick* gaining recognition decades after its initial publication seems like an idea much more unlikely today, but it is also entirely possible that it would have been disseminated more widely and discovered by someone in a much more timely fashion is also a serious possibility

we can convert items in our working memory to our long-term memory and build the "stable knowledge structures" in our minds that help us navigate the web of networks online (Carr 217). Without the ability to make connections and draw conclusions from the wealth of information online, we become shells of our former selves, mere navigators of information, unable to become contributors to it.

Our culture of close reading has not been taken over (at least not yet). As Stephen Marche contends, for instance, "we're living in a golden age for writers and writing" (Marche), where people are reading and buying books more than ever. It is beautiful to think that we can access millions of books, stories, poems, and essays immediately, and even draw large-scale conclusions about them on a scale well above the possibilities of the human mind. For the millions of books that are not read at all, their texts still have the possibility (through machine reading) to contribute to our understanding of the world around us. It may be harder to be an author, but everyone can be a writer and add to the great conversation of humanity in one way or another. Most importantly, not only can everyone be a writer, but also everyone can be a reader and read in a variety of ways.

Whether we like it or not, the information age has fully arrived. Socrates' concerns with the effects of writing technology focused on their effects on "memory and intelligence" (*Phaedrus* 77). What Socrates did not realize, however, is that what we lose this sacrifice of one's personal cognitive capacities, we gain back many times over in the intellectual technologies that open up entirely new possibilities for humanity's collective memory and intelligence. The amount of art, writing, and mathematical and scientific data online that people can use to learn represents nearly the entire stored record of human thought and achievement. As we rapidly transition from a print-based culture to our expanding digital world, certain elements

of the human experience are changing form—readers, the reading process, and literature, the most integral elements in our print-based world perhaps more drastically than anything else. While close reading, computer-assisted human reading, and human-assisted computer reading can and must function synergistically if they are not only to thrive, but also to survive in the twenty-first century, we must recognize that they are inherently different forms of reading that all must be used widely in order to take full advantage of the infinite amount of possibilities our technologies now give us, that miraculous abilities to transcend “the fury and the mire of human veins.”

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