

A Digital *Ulysses* for the Errant Reader:
Joycean Encyclopedism and the Encyclopedic Web

By

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A Digital *Ulysses* for the Errant Reader:
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In his keynote address to the 1984 International James Joyce Symposium, later published as “Ulysses Gramophone: Hear Say Yes in Joyce,” Jacques Derrida describes *Ulysses* as a kind of Internet unto itself: “a hypermnesic machine capable of storing in an immense epic work Western memory and virtually all the languages in the world,” whose expert reader “has at his command the computer of all memory” and “plays with the entire archive of culture.”¹ Derrida is thinking science-fictionally, imagining far past the information technology of his moment. In 1984, the bare beginnings of the Internet as we know it were years away. The first widely available platforms for reading and writing hypertext offline, such as HyperCard and Storyspace, would not appear until 1987. The World Wide Web would only come online in 1991, and it would only become browsable in something like its familiar form with the release of Mosaic, the precursor to Netscape Navigator, in 1993.

Derrida says that only an “*n*th generation,” “as yet unheard-of computer,” could keep up with the endless play of signification and proliferation of reference *Ulysses* instigates.² That *n*th generation may still be a ways off, but its technology sounds a lot like ours, and the way Derrida reads *Ulysses* in “Ulysses Gramophone” anticipates the archive-wandering way we often read on networked devices. He enlarges encyclopedically on one word from the novel, *yes*, ranging over and around the text, taking in Stephen and Bloom’s snack at the cabman’s shelter in “Eumeaus,” YES brand yoghurt, the many postcards in the novel, some postcards Derrida once looked at in Tokyo, *16 Ways to Avoid Saying No* by Massaki Imai, the French homophones *oui* and *ouï*, telephone calls in “Aeolus” (mostly answered “Yes...”), the modern telecommunications

network as a figure for the system of language in which Bloom is constituted and lives, the cry “*Elijah! Elijah!*” as he escapes at the end of “Cyclops” (345), the ass that brays “*ja, ja*” in *Thus Spake Zarathustra*, Molly’s final “Yes,” and dozens of other things in the novel or suggested by it. Reading along today, we might imagine Derrida at the keyboard of his notional computer, Googling.

Through the 1990s, as hypertext proliferated with the adoption of dial-up Internet and the growth of the Web, Joyce scholars planned and prototyped real versions of Derrida’s electronic, hypermnesic *Ulysses*. They aimed to use hypertext to make a better annotated edition of the novel—a more modest project than building the culture-comprehending supercomputer Derrida imagined, but still an effort to realize some of the potential given form in his Joycean science fiction.³ In the early 2000s, after they had debated principles and refined their prototypes for several years, their work seemed to be culminating in a single effort, run by Michael Groden out of SUNY-Buffalo. “Digital *Ulysses*” was to link the novel’s text with some 5,000 pages worth of annotation, solicited from hundreds of scholars around the world.⁴ A Mellon Grant of \$170,000 enabled Groden to complete the first-ever hypertext annotation of a full episode from the novel, “Proteus,” in 2003. Unfortunately, he lost the favor of Joyce’s estate later that year. They demanded a permission fee of \$1.5 million. Their intention seems to have been to shut “Digital *Ulysses*” down, and that was certainly the effect.⁵ The episode put a chill on work towards a digital annotation of *Ulysses* for about a decade.

It now seems feasible to return to that project. The novel has entered the public domain in Australia, Canada, and nearly all of Europe.⁶ Robert Spoo’s argument that the U.S. copyright on its first edition expired in 1998, moreover, has gained fairly wide acceptance.⁷ Amanda Visconti at the University of Maryland recently started a public annotation project, largely on the model

of the online community Reddit, called “Infinite *Ulysses*.”⁸ Other experiments are sure to follow. As we think about how best to proceed, it seems worthwhile for those of us who are eager to continue the work of Joyce’s first digital annotators to take stock of how different our starting point is from theirs.

Hypertext was never adequate to the task of making a digital *Ulysses* that would be true to the novel’s polysemy and encyclopedism, and today’s information technology is. In the 90s and early 2000s, there was no overcoming the determinacy of hyperlinking. Now, thanks to Google’s reorganization of the Web into a kind of encyclopedia, the growth of the online archive to near-comprehensiveness, and the pervasive adaptation of habits of attention to those developments, a digitally literate person reading a plain, unannotated copy of *Ulysses* online can open the novel up to its referential surroundings and explore them as they read, much as Derrida does in “Ulysses Gramophone.” That type of reading seems in keeping with the spirit of the novel, which we might identify with Bloom’s errant, encyclopedic curiosity. And readings of that type could be much enriched and made a more vital part of digital culture if Joyceans were to set aside the old goal of using new resources to produce a new edition of the novel and work instead at improving the technology and archive that already make the simplest online presentation of its text a vast improvement on the best efforts of the hypertext era.

In making a case for a networked *Ulysses* that readers annotate idiosyncratically by straying from text to archive, I’m arguing for the value of elective distraction. Distraction is often described as being corrosive of our ability to read as well as we might, and this can be so. Distraction that disrupts a reader’s negotiation with a work is usually an undesirable intervention in their autonomy or attention. However, distraction that’s elective can help sharpen attention and enable types of awareness and perception that are unavailable to contemplation.

This line of thinking is developed most influentially by Walter Benjamin. He focuses mainly on two kinds of distraction: the kind imposed by cinema, which steamrolls contemplation by constantly flashing fresh images onscreen and continually cutting to new shots, and the kind of “reception in a state of distraction” whereby one comes to know architecture by moving through it while paying attention to other things.⁹ For Benjamin, both modes of distraction are useful responses to modernity. With cinema, disruptive distraction keeps the viewer from lapsing into complacency about how threatening the world has become.¹⁰ Every frame and cut says: there’s no time to lose yourself in pictures; get caught mooning about art, and you’re liable to be run over by a car. With “reception in distraction,” the wandering subject gradually apprehends and adjusts to something new that’s too much to take in at once. This is, for Benjamin, the “canonical” model for learning to be modern: spend time in an unfamiliar space and you’ll get to know it by habit; attend to your surroundings with distracted curiosity, and your perception won’t be dulled by habituation; move surely and see clearly, and no one else will lead you around.¹¹ The flâneur finds his own way by meandering. This is Bloom’s freedom—and Derrida’s.

Like the Benjaminian flâneur, the reader of *Ulysses* contends with unmanageable modernity as a spatial problem that’s inseparable from problems to do with authority and attention. “Reception in distraction” is a strategy available to those, such as Derrida, whose command of the cultural archive into which the novel extends is such that they can ‘annotate’ it by following their stray thoughts as they read. But when we talk about annotation, we mostly mean supplying referents second-hand, on paper, to readers who can’t find their way around the text on their own. Doing this typically involves a second-order spatial problem from which

intransigent problems of authority and attention follow: that it isn't practicable for an annotator to provide readers with enough referential surrounding to loiter in and explore.

Ulysses is so crowded with references, it's so polysemous, the literature on it is so extensive, and its readership is so wide and diverse, almost every word of it solicits annotation, and for almost every word, different readers will want different notes. However much room there is for printed notes, whether it's at the foot of each page or the back of the book, or in a separate book, it can never come close to being enough to fit everything every reader might want from an annotator. The annotator will have to choose to make some notes and not to make many, many more. This will always involve an imposition of editorial authority. And whatever apparatus the annotator provides, it will, just by being there and taking up the space it takes up, make demands on the reader's attention that will disrupt their reading.

Consider, for example, a short paragraph from "Lestrygonians." Bloom is on his way to lunch and his mind is wandering around a thought. He's just run into Josie Breen and she's given him the news that Mina Purefoy is laid up in the maternity hospital he'll visit in "Oxen of the Sun." He thinks:

Poor Mrs Purefoy! Methodist husband. Method in his madness. Saffron bun and milk and soda lunch in the educational dairy. Eating with a stopwatch, thirtytwo chews to the minute. Still his muttonchop whiskers grew. Supposed to be well connected. Theodore's cousin in Dublin Castle. One tony relative in every family. Hardy annuals he presents her with. Saw him out at the Three Jolly Topers marching along bareheaded and his eldest boy carrying one in a marketnet. The squallers. Poor thing! Then having to give the breast year after year all hours of the night. Selfish those t.t's are. Dog in the manger. Only one lump of sugar in my tea, if you please. (161)

A reader who gets most of what's there still might have questions. Even if they see the allusion to *Hamlet*, understand from context why Mr. Purefoy might time himself chewing, know that Dublin Castle was the headquarters of the British government in Ireland, and guess that a market

net is a shopping bag and the Three Jolly Topers is a pub, they might not know that the name Methodism, and the stereotype about Methodists Bloom is riffing on, derives from the methodical way John Wesley and his followers planned their lives, or that an educational dairy is a type of health food store, or that “t.t.” stands for teetotaler, or that a dog in the manger is, after one of Aesop’s fables, someone who takes something they don’t need. Another reader might get everything but *Hamlet* or Dublin Castle. Or they could be baffled by something in the text that might, for most readers, coming from the cultural and linguistic backgrounds readers (and annotators) of *Ulysses* mostly come from, not seem a likely candidate for annotation—“muttonchop whiskers,” say.

No printed annotation of *Ulysses* covers all of these contingencies. Penguin’s 1992 *Annotated Student Edition* of the 1960 Bodley Head text, annotated by Declan Kiberd, and the 1993 Oxford World Classics reprint of the first edition, annotated by Jeri Johnson, both come equipped with back-end notes sections that are longer than *Dubliners* or *A Portrait of the Artist*. Kiberd’s runs to 260 pages, Johnson’s to 217. That might sound pretty exhaustive, but it’s only enough room for a few notes per page. For the paragraph above, Johnson just gives the reader Dublin Castle.¹² Kiberd has “t.t.,” the dog in the manger, and for “Methodist husband,” a discursive note about Joyce’s disapproval of Protestantism.¹³ The 2010 Alma Classics *Ulysses*, which returns to print the Odyssey Press edition of 1939, includes 316 pages of notes by Sam Slote in small print tightly packed into two columns. It’s hard to measure, but there seems to be almost as much annotation as text. Slote gives *Hamlet*, the educational dairy, the real-life identity of Theodore’s cousin, Dublin Castle, the Three Jolly Topers, “t.t.,” and the dog in the manger.¹⁴ Don Gifford’s huge book of notes *Ulysses Annotated* (1974, revised 1988), which, at 643 double-sized pages of double columns, is considerably longer than *Ulysses* itself, has everything

Slote has, plus “tony” and “squallers.”¹⁵ For all they that cover, neither Gifford nor Slote explains the basic received idea about Methodism Bloom is playing with. In his 1968 book *Allusions in Ulysses*, Gifford’s main precursor, Weldon Thornton, notes only the references to Shakespeare and Aesop.¹⁶

Being selective, these annotations are normative. Notes always tell readers: you ought to know this. Where there are many possibilities for annotation and there’s comparatively little space to give notes, those that are given say: you really ought to know *this*. Notes to *Ulysses* inevitably recommend, in the voice of the expert, a particular reading over others. By singling out and explaining the reference to Dublin Castle, Johnson nudges the reader towards a political reading of Bloom’s thoughts about Theodore Purefoy’s Methodism. Kiberd’s long note about Joyce and Protestantism directs the reader to think about them more narrowly in terms of religion. In glossing so many of the paragraph’s details without explaining its broader subject, Gifford and Slote guide the reader away from finding a rhetorical thrust to Bloom’s thoughts. Thornton, in keeping with the more limited ambit of his book (and, arguably, the critical orthodoxy of its moment), gives those thoughts a high-cultural polish. All of these glosses have their merits, but they all screen off other interpretive possibilities.

The authority of printed notes imposes on the reader’s autonomy. Readers don’t have to follow the interpretation their notes privilege, but they’re pointed in that direction. This kind of interference seems contrary to how *Ulysses* works. Reviewing Gifford’s book, Fritz Senn allows that readers of the novel need glosses but argues that, all the same, the emphasis given by annotation is “in some essential sense... at cross purposes with *Ulysses*, which leaves evaluation up to us, does not usually highlight what is important.”¹⁷ Senn continues:

From each textual node, we could go in many potential directions; annotation has to be selective and so often limits itself to one particular road... Notes by nature

look resultative, not explorative. They pretend that the goal has somehow been reached, when, usually and Joyceanly, the goal itself is in question.¹⁸ The trouble is not so much that notes determine interpretation, though they seem likely to do that to some extent, but that they model determinate reading

Dealing with printed notes, what's more, is a drag on the reader's attention. Where paratext is physically present, the reader must continually attend to it. A reader of the Kiberd or Johnson edition must flip to the back whenever they want to check something. A reader with Gifford's or Thornton's book open beside them will be able to refer to their notes more easily, but glancing at it regularly will make them aware of most everything that's glossed. They will usually know when they're reading something the notes could tell them more about and have to decide whether to refer to them or read on. A reader of Slote's edition, which gives indicator numbers along the righthand margin, will have to decide whether to read on or refer to the paratext every time there's a note, because the numbers will always be in sight. If there's never been an edition of the novel done with footnotes, it may be because it would be exasperatingly disruptive to overlay a text as demanding as *Ulysses* with indicator numbers while placing notes directly in the reader's field of vision.

However the reader's attention is divided between the text and the paratext, they're likely to track what the paratext is doing. This siphons attention away from their negotiation with the text and its context. With a small body of notes, as in Kiberd or Johnson's editions, for which most every note comes at the exclusion of a lot of other likely ones, many readers will make an ongoing study of the few things the annotator has chosen to note. Where annotation is more extensive, as in Gifford's guidebook or Slote's edition, omissions will be conspicuous, and many readers will wonder about them. *Why does Johnson only have a note about Dublin Castle? Why*

don't Gifford or Slotte explain about Methodism? These aren't questions about the novel or the world of the novel.

Given so little space to gloss a novel about which so much could be said, an annotator working on paper can't help imposing their authority on the reader and dividing their attention, making the reading they do less autonomous and attentive. To the Joyceans who worked at annotating the novel digitally in the 90s and early 2000s, hypertext seemed to offer a solution to those problems. Virtual space is, for practical purposes, infinite. A standard CD-ROM has room for about a quarter of a trillion pages of text. Whereas printed notes distract the reader just by taking up space, virtual notes are nowhere and nothing until they're called up. And hypertext was widely touted as being a much more open and unauthoritative structure for organizing textual systems than the codex.

The first prototypes for a digital *Ulysses* were made at the dizzy height of optimism about hypertext's potential to transform literature. Even before that first graphical browser, Mosaic, began to popularize the Web, hypertext enthusiasts such as Jay David Bolter, George Landow, and Robert Coover were effectively declaring that the literary-technological future imagined by Derrida had arrived. Their model hypertexts were experiments such as Brown University's Intermedia project, which networked more than a thousand text and image files using over 1300 hyperlinks,¹⁹ and works of hypertext fiction written on Storyspace, a software platform specially designed for writing and reading literary hypertext, most notably Michael Joyce's *Afternoon: a story*. (For several years, Landow taught a survey of English literature using Intermedia; Bolter and Joyce were the co-creators of Storyspace; Coover led creative writing seminars using both.) In essays published as early as 1987 and 1989, but most influentially in his 1992 book *Hypertext*, Landow argues that hypertext embodies the radical decentering of narrative, destabilization of

language, and dismissal of the author theorized by Derrida and Roland Barthes.²⁰ In his 1991 book *Writing Space*, Bolter argues, for reasons similar to Landow's, that a shift is underway towards hypertext as the new paradigm for writing and the book.²¹ In a 1992 *New York Time* essay titled "The End of Books," Coover proclaims that "interactive and polyvocal" work such as Joyce's is displacing the traditional novel and that broadly poststructuralist "hypertext buzzwords" such as "fluidity, contingency, indeterminacy, plurality, discontinuity... seem to be fast becoming [basic principles of literary form], in the same way that relativity not so long ago displaced the falling apple."²²

More than any other work, *Ulysses* was figured by hypertext's enthusiasts as being a bridge or pivot point between the old paradigm for literature and this new one. In *Hypertext*, Landow returns to it again and again, and to "Nausicaa" in particular, as an example of "implicit hypertext in nonelectronic form" and "page-bound text" that would be more fully realized as hypertext enmeshed in and annotated by a larger network of textual nodes.²³ (He singles out "Nausicaa," it seems, because so much of Gerty MacDowell's world is literally made up of other texts.) Bolter goes farther than Landow does, describing *Ulysses* and *Finnegans Wake* as being forerunners to literary hypertext, but also potential limit cases for the possibilities it presents. Without quite explaining how they would work, he imagines hypertext annotations of Joyce that might approach the comprehensiveness of Derrida's notional *n*th-generation "joyceware." A thorough-enough mapping of the references in an episode of *Ulysses* would, he muses, produce

a massive network that the scholar and even the casual reader... could traverse in a variety of ways.... This process of discovery would be almost, but not quite, endless. In the theoretical limit, the result would be an interactive text that contained within it all the possible readings of that chapter. Working one's way through this network.... would be the reading of readings—both watching and becoming the ideal reader of Joyce in the act of reading.²⁴

Many Joyceans were eager to try to put his and Landow's theorizing into practice.

Groden, Heyward Erlich, and the many other scholars who worked towards producing a digital annotation of *Ulysses* before Joyce's Estate put a freeze on the enterprise were, to some extent, swept up in the enthusiasm that tilts many of Landow, Bolter, and Coover's claims towards grandiosity—and they were subject to the limitations that make much of the theorizing about hypertext from their moment seem out of pace with what was then possible. Their projects belong to what N. Katherine Hayles has designated the first generation of electronic literature,²⁵ which might best be described as print culture's attempt to invent digital culture before it evolved on its own. First-generation electronic literature introduces formal innovations that are meant to free readers and writers from the limitations of the printed page and the codex, but the page and the codex are still its primary frames of reference. First-generation work is self-contained, as books are. The hyperlink is its main structuring element, and that doesn't make as much of a difference as many supposed.

The trouble is, hyperlinks are binary. They encode a one-to-one correspondence between what's linked (the anchor) and linked to (the target). If hypertext embodies a theory of language and signification, it must be one in which words have determinate meanings and referents. So long as digital text is held together by hyperlinks, the nearly limitless capacity of digital media can't offer annotators a way around having to choose one thing to note. Hypertext opens up and decenters texts in some ways that are consistent with the aims of poststructuralism, but its structure does not allow for real polysemy or play among signifiers. It can model free play, but only along fixed tracks, as a rod hockey game does. A hypertext *Ulysses* could include a lot more notes than *Ulysses Annotated* or Slotte's annotation, but those notes would still need to be selective and therefore normative. The field of reference opened by a hypertext annotation of the

novel might be wider than any that a printed book could materialize, but it would be much, much narrower than that which the novel implies.

Ulysses is, as Joyce told Carlo Linatti in 1920, “a sort of encyclopaedia” (*Letters II* 143). “Encyclopedia” is derived from the Greek words “*kyklos*” and “*paideia*,” “circle” and “education.”²⁶ As a genre, it was devised as an alternative to the dictionary, which might usefully serve as a figure for the model of discourse hypertext can’t help embodying. A dictionary definition places a word in fixed correspondence with a finite set of meanings or referents. It draws straight lines between points on a map. Its reader learns an abstracted geography. An encyclopedia entry dilates around the term whose sense and significance it elaborates, encompassing all it can of the material, changing world in sight of that center. This circle overlaps with others, making a vast shape that encompasses a totality. Its reader is meant to explore this space, making their own connections, educating themselves as they please. (Diderot calls the *Encyclopédie* “a living school for philosophers.”²⁷) Senn’s overriding concern about notes is that they’ll keep readers from doing that kind of seeking.

Ulysses is encyclopedic in its catholicity and comprehensiveness, and, as Kevin Attell observes, in its attempts “to think the subject in a way that opens it up beyond the boundaries of the discrete self onto the world.”²⁸ Its characters, Bloom most emblematically, and its reader explore a world that’s continuous with the unwritten world. For Stephen and Bloom, and for some readers, this may be a way of figuring themselves out, as part of a world. Hypertext annotation might be able to turn *Ulysses* into a selective dictionary of its own meaning. What it’s unequipped to do is make the text and its referential surroundings into an encyclopedic virtual space for the reader to find their way in.

Landow imagines a hypertext presentation of “Nausicaa” in which Gerty MacDowell’s perfumed self-narration is supplemented with information about Edwardian advertising, romantic literature, and women’s magazines; the Catholic church; 1904 Dublin; the *Odyssey*; other parts of the novel and other works by Joyce; textual variants; and relevant criticism, “mak[ing] explicit... the linked materials that an educated reader perceives surrounding” the episode.²⁹ But *an* educated reader, however well educated, will never make an authoritative reading. Every reader finds different overlap between their frame of reference and the novel’s, sees different cues to make different connections, and stops to work through those connections at different points.

The bat that flies over Gerty as she listens to the benediction at Mary, Star of the Sea (363), might suggest Gothic romance, bat symbolism in medieval Christianity and the occult, echolocation as a figure for her willfully blind but reciprocal fantasizing, Bloom’s chiropterological thoughts later in the episode (377), Stephen Dedalus’s vampire poem (48, 132), the “bawk of bats” in Anna Livia Plurabelle (*FW* 215), John Bishop’s observation that “even while [Gerty’s] attention is cast upward, her mind gravitates towards lower things which never quite achieve full representation in her awareness” (the bat is a high-flying emblem of the infernal, and it’s blind),³⁰ the bat-like gibbering of Penelope’s slain suitors as their souls enter the underworld,³¹ or Gerty’s reflection, after Bloom’s orgasm, that the bat has been their only witness, “and little bats don’t tell” (367). Or the bat might register as a detail that doesn’t indicate anything but itself. It will depend who’s reading the episode and in what circumstances. If it’s true, as Landow argues, that the novel implies a hypertext, it’s a different hypertext for every reader and every reading.

The basic question guiding the scholarly conversation about producing a hypertext *Ulysses* in the 90s and early 2000s was: how to work around the determinacy of hyperlinking and take advantage of the nearly infinite capacity of new digital media to make annotation less authoritative?³² The novel's would-be digital annotators came at that question with tremendous ingenuity, but the limitations of hypertext were such that they were, at best, able only to widen the novel's field of reference a little bit and to give the reader only a little more autonomy than Gifford could or Slotte later would. Unfortunately, they did so at the cost of having their apparatuses put much more strain on the reader's attention.

Hypertext was bound to be disruptive. Links are at least as conspicuous an intrusion on the virtual page as indicator numbers would be in a footnoted print edition. Because digital annotations are nowhere and take up no space until they're clicked, they need to be indicated in the reader's field of vision. Several studies have shown that continually seeing links and deciding whether or not to click them scuppers attention in a way that diminishes reading comprehension.³³ The only alternative, which Groden and Erlich both experimented with, is to hide all the links and require the reader to continually run their cursor over the text to detect anchors. This has the advantage of not making every anchor stick out and get special emphasis, but the disadvantage of forcing a more involved engagement with the apparatus. In either case, hypertext annotation will put something disruptive between the reader and the text.

With simple, determinate, one-to-one links, the disruption seems fairly modest. It's the slight drag links ordinarily have on attention, made somewhat worse by the greater than usual number of links that annotating *Ulysses* is likely to require and the unusual demands on attention such a difficult text makes. Where the digital annotators of the Web 1.0 era tried to stretch the

basic structure of hypertext to make room for more referents and give the reader some choice among them, they tended to make their paratext more elaborately and intensely disruptive.

After experimenting with several possibilities in his personal annotation project, “James Joyce’s *Ulysses* in Hypertext,” Groden settled on using layered annotations in nested pop-up windows for “Digital *Ulysses*.”³⁴ Each successive pop-up would give more specialized information or analysis, and readers could click through, piling windows up on the screen, until their interest had been satisfied or they reached a dead end. Then they would have to close each window to get back to the text. This workaround was something like a consensus solution that emerged from a pivotal discussion about hypertext annotation that Groden led on the j-joyce listserv in November and December of 1998. It was meant as a way of meting out help to the reader, offering them exhaustive annotation without overwhelming them with all of it at once and letting them decide whether, for example, they want to read a scholarly interpretation of the facts they’ve just been told or find out about something that happens later in the novel.

The “James Joyce’s *Ulysses* in Hypertext” prototype of layered pop-ups gives notes to Bloom’s conversation with Bantam Lyons in “Lotus Eaters”—the “throw it away”/“Throwaway” scene. From the word “Ascot,” the reader can click through four windows, showing (1) the date and time of the Gold Cup race, (2) the race report from the *Freeman’s Journal* as condensed by Gifford, (3) the spoiler that the race will be won by a horse called Throwaway at 20-1 odds, and (4) a more discursive note taken from Kiberd’s edition, explaining how Bloom’s comment about the copy of the *Freeman’s Journal* he’s urging Lyons to take, “I was just going to throw it away,” will start the rumor that he’s won big on the race, and giving some of Kiberd’s thoughts on “the treachery of misunderstood language” in the novel.³⁵ This makes a considerable quantity and variety of annotation available to the reader and gives them some control over how much

and which of it they work into their reading. But these are only slight improvements on the more limited capacity and pronounced authoritativeness of printed annotation, and the trade-off is that the reading text is continually blotted with chunks of paratext—see figure 1, on the next page—and reading is made to involve regular runs of picking and clicking across the screen. And, still, most of the time they use the apparatus, readers will have to look at and dismiss a lot of notes.

Erlich tries a different approach from Groden's and gets a similar result with the most elaborate version of his "James Joyce Text Machine," a project that grew, between 1991 and 2002, to include a dozen possible formats for annotating a few pages of "Calypso" with hypertext. He also breaks up the targets of his links, but instead of parceling the parts out in a chain, he distributes them around the text, in a horseshoe pattern of five frames (see figure 2.)³⁶ By clicking a line number, the reader brings up, in separate frames, material from Gifford, William M. Schutte's *Index of Recurrent Elements in James Joyce's Ulysses*, Erlich himself, Hans Walter Gabler's synopsis of the novel's genesis in manuscript, and a concordance to the text. The reader's choice lies in where to look, rather than in whether to keep the notes coming. This has the advantage that the reader will know, broadly, what kind of information is available, whereas with Groden the choice is typically amounts to whether they want a note that's more specialized. Erlich's frames effectively give his anchors multiple targets. In later editions of *Hypertext*, Landow is enthusiastic about the potential of this type of "many-to-one" linking.³⁷ It seemed a promising workaround to the cramping binariness of links.

But with only the space of the screen to work with, links can only be split in so many directions—if they're no longer exactly binary, then they're still narrowly finitary—and the more of that space is taken up with paratext, the likelier readers are to have their reading disrupted by it. Erlich's five-frame apparatus overloads the screen with information. There is always the digital

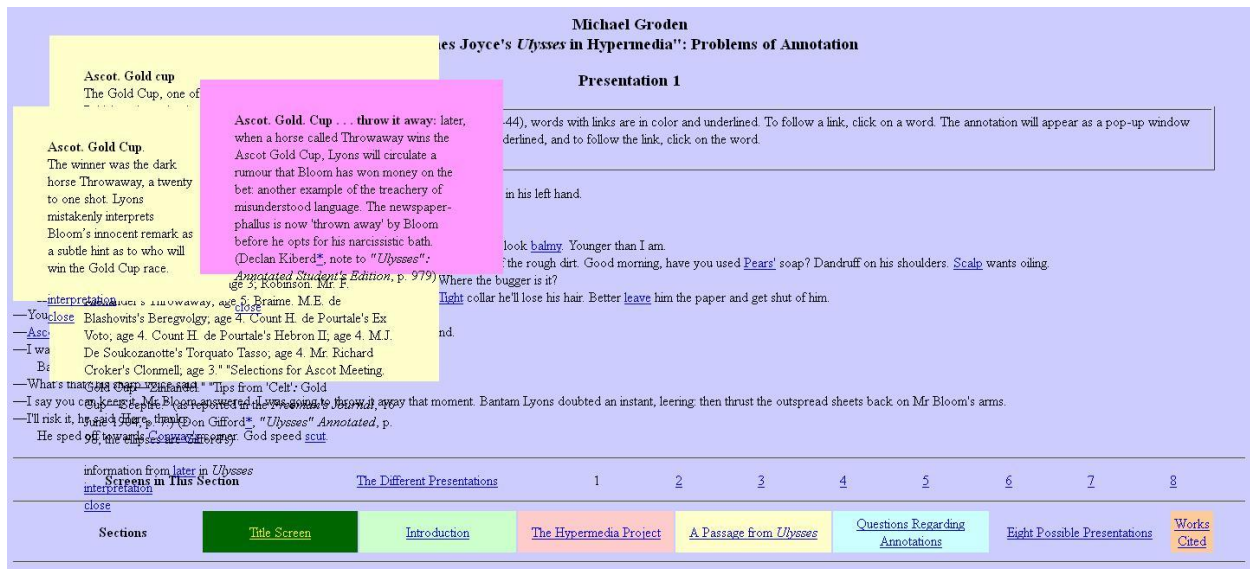


Figure 1: Groden's "James Joyce's *Ulysses* in Hypermedia" prototype in "links highlighted, mouse-click, pop-up" mode.

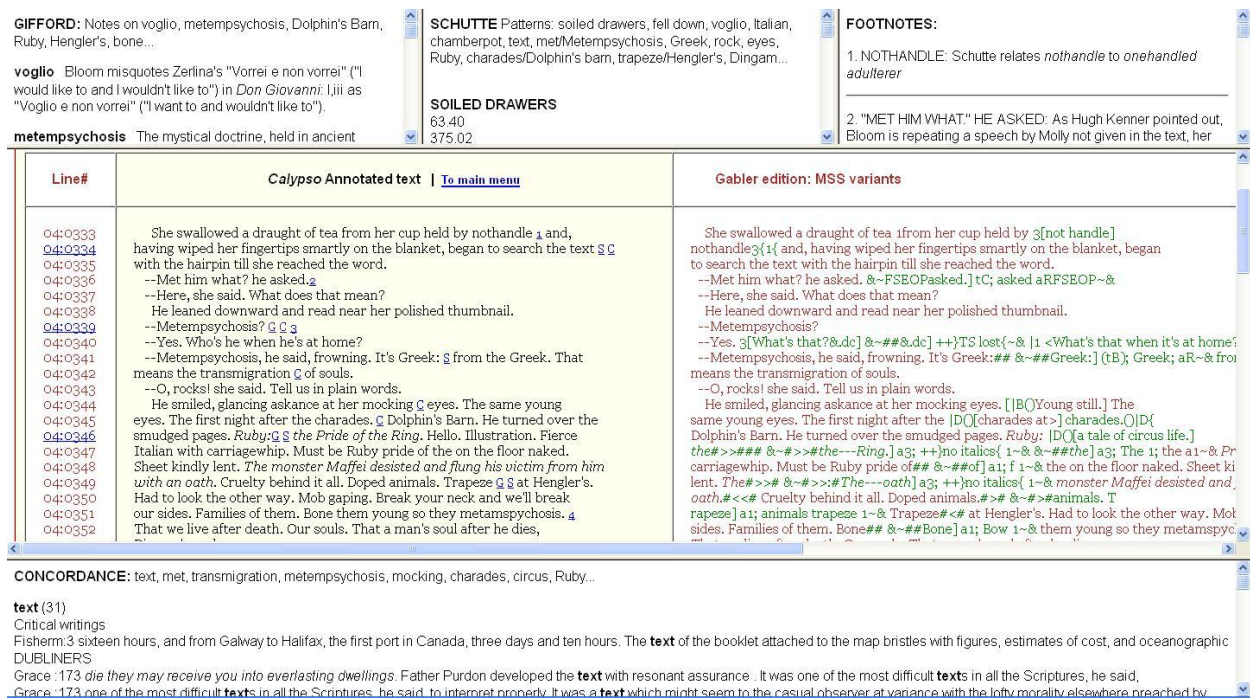


Figure 2: Erlich's *James Joyce Text Machine* in "synchronized multiple annotation" mode. The main reading text is in the frame tinted pink.

equivalent of five other books open in the reader's field of vision. It is hard for readers to fully ignore them when they're trying to focus on the novel's text, and when they turn to one of them, having the other four also flip to a relevant page will be its own unwanted distraction. Looking at Groden and Erlich's prototypes, or at David Gold's proposal for a hypertext *Ulysses* with color coded links,³⁸ which would trade off letting the reader know, broadly, what kind of note is being anchored with the constant distraction of having a multicolored reading text, it becomes tempting to conclude that any gain in overcoming the authoritativeness of hypertext will necessarily be canceled out by new demands on readerly attention.

It might be enough to say that it's almost impossibly hard to invent new ways of reading. As Steven Johnson observes in his 2013 essay "Why No One Clicked on the Great Hypertext Story," the "intense hunch" shared by the enthusiasts of the first generation of electronic literature "that words linked electronically to other words... were about to become a central mode of communication" was exactly right, but their guesses about the forms that would take were almost all wrong.³⁹ Those forms would only emerge *a posteriori*, from the massive-scale trial and error of the whole world coming online and figuring out what to do there. Hypertext fiction of the type written by Michael Joyce never found more than a small niche audience. Twenty-some years after "The End of Books," Coover is still writing books. Although networked electronic text now constitutes a huge part of the world we live in and an inescapable dimension of our everyday, only a vanishing fraction of it reads much like Joyce's *Afternoon*—"the rounding error of a rounding error," Johnson reckons. If Groden and Erlich couldn't figure out how to make networked reading practicable, neither could Joyce, Landow, Bolter, Coover, or anyone else at the time.

Derrida's *n*th generation of Joycean high technology couldn't be hurried along, and it hasn't arrived yet, but it has started to catch up with us. In the summer of 2003, around the time work on "Digital *Ulysses*" was being shut down by Joyce's estate, two Australian contributors to the e-book archive Project Gutenberg, Col Choat and David Widger, uploaded a copy of the first edition of *Ulysses* in plain text and static HTML.⁴⁰ In itself, it's everything a digital version of the novel wasn't supposed to be. It makes no special use of its electronic medium. There are three links, at the very top, to the novel's first, second, and third sections. Otherwise, it doesn't include anything a printed edition wouldn't. It's unenhanced, unannotated, and bare. Nothing about it even requires a graphical browser—it's practically pre-Web 1.0. But in the decade since it was posted, as work on digitally annotating *Ulysses* has been at a standstill, the Web, the Web browser, our online reading habits, and digital culture have grown up around it. Read today, by a digitally literate reader on a modern browser, as part of today's Web, the Gutenberg *Ulysses* is an enormous improvement on the hypertext experiments of the 90s and early 2000s.

Its very plainness is its first big virtue. The text is clean. If the reader wants to focus on it, nothing in their visual field is going to divide their attention. But if they hit a spot of incomprehension they'd like to clear up or if their thinking along with the novel points them outside the text, they can select the word or phrase they're stuck on or that's kindled their curiosity and, with a left and right click that are, for most Web-literate readers, so practiced as to feel like second nature, bring up a set of search results in a new tab. They can then take these in at a glance—years of searching will have trained their eye as well as their hand—and, often enough, they'll find the thing they're looking for or the promising next point along a more errant line of thought or inquiry.

With a steady Internet connection, a copy of Chrome or Firefox, and Google, it's now possible for a reader of the Gutenberg *Ulysses* to do the sort of self-directed annotation that Derrida models and that Groden and Erlich lacked the technology to make feasible. In the course of reading the paragraph from "Lestrygonians" discussed above, that reader could bring up character sketches of Mina Purefoy from several online guides to the novel, the Wikipedia article on Methodism, the reference for "method in his madness" in *Hamlet*, commentary both on the original line and Joyce's uses of Shakespeare, several histories of Dublin Castle and the occupation of Ireland, a Groden-era Joyce website telling the identity of Theodore Purefoy's cousin, the location of the Three Jolly Topers, the meaning and origin of "dog in the manger," definitions of "educational dairy," "tony," "hardy annuals," and "squallers," and hundreds of pictures, historical and contemporary, of muttonchop whiskers. Searching for the whole sentence "Eating with a stopwatch, thirtytwo chews to the minute," will get the reader a selection of critical articles that discuss it. Google has some trouble with "t.t.," which might also stand for the Isle of Man Tourist Trophy motorbike race, the popular video game based on it, or the software company Trading Technologies, and which is the national URL suffix for Trinidad and Tobago (".tt") and a much-used lazy substitute for the pi symbol ("TT"). Similarly, "marketnet" brings up pages of business websites. In those cases, and in most others, the reader can vastly improve their results by adding the specifying search term "ulysses." And, crucially, if they don't elect to look outside the text, nothing about the technology that enables them to do so (except, maybe, their knowledge that it's there) will interfere with their reading.

When they do look outside the text, a reader of the Gutenberg *Ulysses* is able to stray farther from it than any annotator could anticipate, to stray off-path in exploring its referential surroundings and make surprising, idiosyncratic connections, as Derrida does in "Ulysses

Gramophone.” By clicking through search results that lead far afield, by adding specifying terms to their searches, or by opening new tabs and searching based on connections suggested that are by their reading but too esoteric to be reified in the network, they can access a vast and wide-ranging field of reference and wander freely in it. The reader of “Lestrygonians” can go deep into the history of English rule of Ireland, learn how to bake saffron buns, find out which pubs mentioned in the novel are still open and which aren’t, watch the relevant scene from *Hamlet*, watch “Every Sperm Is Sacred” and the subsequent bit about Protestants and contraception in Monty Python’s *The Meaning of Life*, research the etymology of “squallers,” read around in Aesop’s fables, or follow the search query “facial hair james joyce” wherever it leads them.

Neither the comprehensiveness of the Web’s archive nor the available means of searching from the novel’s text have come close to catching up with Bolter’s hypothetical limit case for annotation or Derrida’s “onto-logico-encyclopedic” science fiction.⁴¹ It’s most unlikely a networked version of the novel will ever comprehend all possible readings or give the reader command of “the computer of all memory” and “the entire archive of culture.” But it doesn’t seem unreasonable to imagine search results from the novel becoming much more apposite and exhaustive, so much so that the reader will usually find the answer to their question or have their curiosity satisfied. Probably the biggest drawback to using searches to annotate the novel is that a great many of its contemporary sources aren’t online. Efforts such as the Google Books Library Project and the Digital Public Library of America are poised to massively increase the breadth and depth of the online archive by adding to it hundreds of millions of printed books.⁴² This is likely to entail big improvements in the ways non-digital-native texts, such as *Ulysses*, are networked with their intertexts and other referents. In general, searches have never stopped

getting smarter. Our context for thinking about how to make a better networked *Ulysses* is a technological modernity that isn't going to stop doing it without us.

Today's information technology is a better match for *Ulysses* than that of the previous era because it has evolved to become more like Joyce's novel. The most promising models for Groden, Erlich, and the other early digital annotators were first-generation electronic literature, discrete hypertext projects such as Intermedia, and early websites—networks that the reader explored by moving from node to node along a finite set of fixed paths. The incompatibility of that form with the polysemy and encyclopedism of *Ulysses* is the basic reason hypertext annotation of the novel couldn't live up to the hopes Bolter and Landow had for it or the more practical ambitions of the Joyceans hoping to improve upon Gifford's book and Kiberd and Johnson's editions. But that's no longer the prevailing way virtual space is structured. The hypertext era, which ran from the time of the Storyspace craze through the heyday of AOL and the Yahoo! directory, has long given way to what Siva Vaidhyanathan calls "the Googlization of everything."⁴³ Our searches now organize the experience we have of the Web much more than links do. Rather than following paths that have been set by someone else, we move through the network electively, developing lines of thought or inquiry. And making searches is very often like thinking with a hypermnesic prosthetic mind or virtually exploring the world because, much of the time, the archive for searches plausibly approaches totality.

Google made the Web an encyclopedia. Its often-stated mission, "to organize the world's information and make it universally accessible and useful,"⁴⁴ is a more businesslike version of Diderot's mission for the *Encyclopédie*,

to collect all the knowledge scattered over the face of the earth, to present its general outlines and structure to the men with whom we live, and to transmit this to those who will come after us, so that the work of past centuries may be useful to the following centuries, that our children, by becoming more educated, may at the

same time become more virtuous and happier, and that we may not die without having deserved well of the human race.⁴⁵

There were other search engines before Google, and similar ones have followed it, but it's Google that fundamentally changed how reference operates online. Before Google, readers in digital environments expected words or phrases to lead them in one direction, or else not to lead them anywhere. Today, whether we use Google or another search engine built to compete with it, we spend much of our lives reading in a digital environment in which every term we select or that comes to our mind can be opened up into an encyclopedic catalogue of referents. The difference between these two paradigms is, for our purposes, the difference between information technology that can't accommodate *Ulysses* and that might have been tailored to it.

A Googlized *Ulysses* is helped by the ways we have adapted our reading and Web browsing habits to that new paradigm. The reorganization of the Web only serves as a solution to the problems of authority that were such a focus of the scholarly conversation about digitally annotating the novel to the extent that readers are able to pick their way through search results judiciously. Fortunately, a big part of digital literacy in the Google era is being able to effectively scan sets of information; make judgments about their likely interest, usefulness, and reliability; and revise those judgments as we read. Although they're selective in that they're ranked based on criteria meant to determine their relevance, search results aren't authoritative the way scholarly notes are. Modern Web searches have trained us to evaluate their results critically, though we mostly do it without thinking about it. Searches would be unmanageable if we didn't. In this respect, being an active, empowered reader is a survival skill online.

Relatedly, the encyclopedic Web has given readers useful new habits of attention. Reading a clean text of *Ulysses* with a search enabled browser does not involve the drag on attention that reading a text annotated by someone else does. Searching from the text is an

elective distraction of a type that has become part of everyday reading and thinking for adept Web users. We have, many of us, adapted to an exponential ratcheting up of information overload by making Benjaminian “reception in distraction” almost a way of life. And, as Hayles has observed, we have lately developed an unprecedented capacity to manage multiple information streams, “as a strategic response to an information-intensive environment.”⁴⁶ She calls this “hyperreading,” and there’s evidence to suggest that it’s a neurological as well as behavioral adaptation.⁴⁷ The modern Web browser has, in turn, evolved to facilitate hyperreading, introducing features such as select-and-click search, which gives searching from text something like the quickness of thought, and tabbed browsing, which allows the reader to manage continuous parallel attention spatially. Hyperreading is not without disadvantages. It comes at the expense of close reading, and the hyperreader may not be capable of doing as much sustained close reading as the reader who has not adapted to our current state of distraction. But, as Hayles and others argue, close reading might not always be the best or most appropriate reading practice.⁴⁸ A hyper-referential work such as *Ulysses* seems to solicit a heterogeneous approach that combines close reading of the text and hyperreading outside of it.

It seems in keeping with the spirit of the novel for the reader to wander in and around the text, as Bloom wanders and Bloom’s mind wanders. *Ulysses* is an epic of errant attention. Bloom’s hyperreading of the world as he explores it is the novel’s anchoring subject. Arguably more than in anything else, his heroism expresses itself in the excellence of the sensitive, sympathetic, imaginative attention he pays, which is also a figure for Joyce’s encyclopedism. When Bloom considers the bat Gerty has seen flying overhead, he thinks of its blindness, metempsychosis, its fear of the church bell, prayer, the priest’s dinner, the nocturnality of bats, their resemblance to wizened old men, the relation of light to color, a cat he once saw, amethyst,

glass, Archimedes, and on and on (377-78), much the way Derrida's mind ranges over YES brand yoghurt, postcards, phone calls, Elijah, *Zarathustra*, and the rest as he considers Bloom and the "polytelephonic structure" to which he belongs. When we talk about the spirit of the novel, we might mean Bloom's roving, restless, seeking intelligence, which is a counterpart to the omniscient, ceaselessly experimenting authorial presence at work in the text.

The Internet has, without the help of Joyce scholars, made a digital *Ulysses* that begins to live up to the imagining and ambitions of Derrida, Bolter, Landow, Groden, and Erlich—an encyclopedia in an encyclopedia, to be received in distraction and annotated freely. The evolution of the Web and our adaptation to it have largely obviated the clustered problems of space, authority, and attention that thwarted early efforts at digital annotation. The technology that networks the new digital *Ulysses* will surely continue to become more useful and the archive with which the novel is enmeshed is steadily becoming richer. But there is still a lot we might do to make that technology and archive better complement the novel.

In her book *Digital Modernism*, Jessica Pressman suggests an appealing direction for such work. Her subject is second-generation electronic literature, a category she takes from Hayles but defines a little differently. Whereas for Hayles the break from the beginnings of electronic literature comes around 1995, with the turn away from platforms such as Storyspace and towards the Web,⁴⁹ for Pressman it comes around 2000, when "born digital" literary work starts to find alternatives to hypertext.⁵⁰ Work from her second generation, best exemplified by *Dakota*, the Korean/American Web art group Young-Hae Chang Heavy Industries' Flash-animated "remix" of Ezra Pound's first two *Cantos*, is difficult, and its difficulty is a pointed challenge to the user-friendliness of hypertext fiction and most of the Web. It makes the reader work to figure things out. It puts pressure on the expectation of control we have online. Above

all, second-generation electronic literature is distinguished by “a commitment to literariness and a literary past.”⁵¹ Because of all this, she argues that it departs from the postmodernism of the first generation and returns to modernism.

Whereas first-generation hypertext tries to invent digital culture, the digital modernism of the second generation responds to it. Specifically, it seeks to correct, or at least exempt itself from, an aesthetically squishy easiness that often characterizes digital culture as it has developed. It takes a corner of the Web and blasts it full of the stuff of high modernism: literariness, difficulty, complicated or obscure intertextuality. *Dakota*'s text flickers quickly on and off the screen to the beat of an Art Blakey solo. It can't be paused or slowed down. Its connections to the *Cantos* are often abstruse and aren't spelled out. It gives the reader a lot to puzzle over and no time to puzzle. Using the complacency-breaking style of cinematic distraction Benjamin describes, it gives the reader something like a sped up, Internet-age experience of being stymied by Pound's difficulty.

A second-generation approach to working on a digital *Ulysses* might start from these challenges: how can we make digital modernism work on Benjamin's other, architectural model for distraction? How can we make the experience of wandering in and around Joyce's text online have more literary-historical breadth and depth? How can we have it include more salutary difficulty? And could our work help make digital culture (or, at least, online literary culture) more full of those qualities?

The idea of creating online communities devoted to annotating the novel seems promising. Visconti would use Reddit-like comment ranking and filtering to enable *Infinite Ulysses* users to manage what might be an overabundance of user annotations and to personalize what kinds of notes they'll see. Marc C. Marino, writing nearer the start of the Web 2.0 era,

suggests using a Wiki to collectively hash out a more homogeneous set of social annotations.⁵²

Both proposals would make the Web more full of modernism, and because the communities they would constitute would primarily be organized around Joyce's text in a detailed, word-by-word and line-by-line way, there would be little risk of users losing sight of the work itself, in all of its demanding particularity, and lapsing into book chat. There is a fair amount of talk *about* difficult literature on the Web, but it's rare to encounter literary difficulty itself, reading online. Making annotation an important basis for discussion of Joyce would redress this somewhat.

Some things to figure out are: how can annotation done by a community of readers be integrated with the larger online archive? Can we keep projects such as *Infinite Ulysses*, and the communities they organize around the text, from being closed off from the rest of the Web, as the hypertext projects of the 90s and early 2000s were, without dissipating them in a wider digital world that mostly has no interest in *Ulysses* or literature like it? Could the organization and personalization of annotations that Visconti has in mind be preserved in search results? Could they be used to give some comments priority in users' searches? If social annotation and broadly archival searching can be combined, how best to strike a balance between the two? To what extent could that be left to the reader, and how would it work? One hopes, anyway, that a member of a social annotation community would be able to choose to read the novel networked with the whole rest of the Web, rather than in a closed system combining the text and the community's annotations, and still participate in and benefit from the community's work.

Reading *Ulysses* as part of the whole Web ought to mean being able to draw on the greatest available wealth of sources in supplementing the text. Another worthwhile question is: how can we help to make the results for searches from the novel as rich as possible, particularly in ways that would give them greater intertextual breadth and cultural-historical depth and,

perhaps, introduce a bit of the right kind of difficulty? The best thing to do would seem to be to help bring more of the novel's sources into search results. Joyce was writing in the 1910s about the 1900s. Information on the Web tilts sharply towards the present. The more pre-digital text that can be integrated into the archive for searches, the better for readers, because it gives them more to work with and because contending with old, unfamiliar primary sources is the sort of difficulty the novel would seem to encourage.

It's possible that Google will do most of the work of bringing unavailable printed matter online—they have invested massively in doing so—but it's far from clear on what terms they plan to do it, in what format, and at what cost. Robert Darnton and others seem right to be wary about the kind of ownership Google is looking to take of a huge part of our cultural inheritance.⁵³ Digitally-minded Joyceans know about the perils of important literary works being under private control. We might do well to get involved in public-spirited projects to bring pre-digital text online, such as such as the Digital Public Library of America and Project Gutenberg, if only as a plan B.

Of course, the contents of the archive for searches only matters to the extent that apposite material comes up in results. Searches from the novel currently tend to produce more noise than signal, particularly searches from single words. A useful hack might be to develop a simple browser extension that adds the term "ulysses" to searches from the URL of the Gutenberg *Ulysses* and such other versions of the novel as might appear online. But that's pretty rudimentary.

The more difficult question is: how to encode relationships between the novel and other texts without linking them? Google Scholar does this pretty effectively with citations—could it be done with allusions or other more ambiguous forms of intertextuality? Or would it be possible

to give priority in searches to results from particularly apposite sources, such as other works by Joyce, standard reference works such as Ellmann's biography and *Ulysses Annotated*, books and articles that appear on the James Joyce Checklist, or material first published around 1904 or 1922? Would there be a way of doing any or all of this with browser extensions or by invisibly encoding the reading text? The alternative would seem to be trying to convince someone at Google or another search engine to help us out.

That's a final thing to think about. It is unlikely that anyone at Google or Bing or one of their competitors would be interested in devoting time and manpower to an unorthodox high-literary annotation project. But if a search engine were to collaborate with Joyceans, as an experiment or a lark, the potential for improving searches from the novel would be tremendous. Integrating material from online communities, identifying digitized print matter that's relevant to the text and giving it priority in searches, encoding implied or possible intertextual connections—this would all require hashing out, but it's much easier to imagine how it could be managed with some control over the mechanism for searches than without. Given how personalized most searches already are, it probably wouldn't be too difficult to give readers tools to indicate what kinds of results they would prefer or to teach the search engine to anticipate what readers want based on previous searches. Words and phrases from the novel could even be given unique semantic identities, as text from the novel, with their own sets of associations, the way Google often does with homographs.⁵⁴ A search for "bat" from page 363 of *Ulysses* could, then, bring up a set of results particular to "Nausicaa," just as a Google search for "ulysses" might in different contexts return sets of results that are all about Joyce's novel, Homer's man of many ways, the eighteenth U.S. President, or the Ulysses space probe.

Collaborating on an annotation project with a company like Google would likely involve making some uncomfortable compromises. Certainly, if we take Darnton's arguments against the corporate digitization of books seriously, we would have to think about whether we could, in good conscience, get involved. Even if we decided, sure, we could, the benefits of collaboration with a corporate partner would have to come at some cost. It is, again, most unlikely we will ever really need to weigh the pros and cons of such an arrangement. But it would be an interesting problem to have.

NOTES

¹ Jacques Derrida, "Ulysses Gramophone: Hear Say Yes in Joyce," in *Acts of Literature*, ed. Derek Attridge, trans. Tina Kendall, revised by Shari Benstock (New York: Routledge, 1992), 281. The essay first appeared in English translation in *Post-Structuralist Joyce: Essays from the French*, eds. Attridge and Daniel Ferrer, (Cambridge: Cambridge University Press, 1984), and it was also in *The Augmented Ninth: Proceedings of the 9th International James Joyce Symposium*, ed. Bernard Benstock (Syracuse, NY: Syracuse University Press, 1988).

² Derrida, 305-08.

³ There was also an overlapping movement, led by Louis Armand in something like the informal way Michael Groden led the movement I will be talking about here, whose goal was to produce a hypertext presentation of the textual genetics of *Ulysses* and *Finnegans Wake*—that is, a digital do-over of Hans Walter Gabler's controversial *Critical and Synoptic* edition of 1984. Their work is interesting and important, but mostly beside the points I want to make in this essay, so I will be bracketing it off from my discussion.

⁴ Suzanne Chamberlain, "Developing an Online Archive of *Ulysses*," *UB Reporter*, 6 February 2003, <http://www.buffalo.edu/reporter/vol34/vol34n12/articles/Joyce.html>. The project was also to have had a separate genetic component, edited by Sam Slote and Luca Crispi.

⁵ For his announcement about this, see Michael Groden, "James Joyce's *Ulysses* in Hypermedia: Update – January 2004," now only accessible through the *Internet Archive*, <http://www.archive.org>. D.T. Max offers some vivid details in his highly critical profile of the Estate's trustee, Joyce's grandson Stephen, "The Injustice Collector," *New Yorker*, June 16 2006, http://www.newyorker.com/archive/2006/06/19/060619fa_fact. Groden tells his version of the story in *Ulysses in Focus* (Gainesville: University Press of Florida, 2010).

⁶ Paul K. Saint-Amour, Michael Groden, Carol Loeb Shloss, and Robert Spoo, "Joyce Works in Copyright and in the Public Domain," *The International James Joyce Foundation*, April 2012, <https://joycefoundation.osu.edu/joyce-copyright/fair-use-and-permissions/about-law/public-domain>. The European holdout is Spain.

⁷ See Robert Spoo, "Copyright Protectionism and Its Discontents: The Case of James Joyce's *Ulysses* in America," *Yale Law Journal*. 108 (December 1998): 633-667. Especially relevant here is that his argument appears to have been accepted by the public e-book archive Project Gutenberg, which can give public-domain books wide circulation online and is known for its diligence about copyright.

⁸ Amanda Visconti, "Infinite *Ulysses*: Planned Features for a Participatory Edition," *Literature Geek*, 25 June 2013, <http://www.literaturegeek.com/2013/06/25/iufeatures/>.

⁹ Walter Benjamin, “The Work of Art in the Age of Mechanical Reproduction” (1936), trans. Harry Zohn, in *Illuminations: Essays and Reflections*, ed. Hannah Arendt (New York: Schocken, 1969), 239-40.

¹⁰ Benjamin, “The Work of Art,” 250.

¹¹ Benjamin, “The Work of Art, 239-40, and “Habit and Attentiveness” (1932), trans. Rodney Livingston. *Walter Benjamin: Selected Writings. Vol. 2. Part 2*, eds. Howard Eiland, Michael W. Jennings, and Gary Smith (Cambridge, MA: Harvard University Press, 2005), 592. This is a similar argument to the more familiar one Viktor Shklovsky makes about habit and estrangement in his *Theory of Prose*, but for Benjamin, the jolt out of familiarity into vivid awareness comes from an action of the mind, not an object of its attention.

¹² James Joyce, *Ulysses: The 1922 Text*, ed. and notes by Jeri Johnson (New York: Oxford University Press, 1993), 821.

¹³ Joyce, *Ulysses: Annotated Student Edition*, ed. and notes by Declan Kiberd (New York: Penguin, 1992), 1004.

¹⁴ Joyce, *Ulysses*, ed. and notes by Sam Slote (London: Alma Classics, 2012). Slote also glosses “hardy annual” as newspaper jargon for a stock subject, though he doesn’t explain the gardening term that’s the vehicle for the metaphor.

¹⁵ Don Gifford, *Ulysses Annotated: Notes for James Joyce’s Ulysses*, second ed. (Berkeley and Los Angeles: University of California Press, 1988), 165-66.

¹⁶ Weldon Thornton, *Allusions in Ulysses: An Annotated List* (Chapel Hill: University of North Carolina Press, 1968), 135. The scope of Thornton’s project is more narrow than that of any of the others discussed here, but I have included his book in the group because it’s typically cited as the first effort to give a thorough annotation of the novel. (See, for example, the listserv discussion cited at n32.)

¹⁷ Fritz Senn, review of *Ulysses Annotated: Notes for James Joyce’s “Ulysses,”* 2nd ed, *James Joyce Quarterly* 27.3 (1990), 660.

¹⁸ Senn, 659-60.

¹⁹ George Landow, “Relationally Encoded Links and the Rhetoric of Hypertext,” in proceedings of Hypertext’87, University of North Carolina, Chapel Hill, November 13-15, 1987, 331-343. The Intermedia project ran from 1985 through 1991. It was shut down partly because of the trouble and expense of maintaining a database that ran to a then-Brobdingnagian 80 MB.

²⁰ Landow, "Relationally Encoded Links;" "Hypertext in Literary Education, Criticism, and Scholarship," *Computers and the Humanities* 23 (1989), 173-198; and *Hypertext: The Convergence of Contemporary Critical Theory and Technology* (Baltimore: Johns Hopkins University Press, 1992).

²¹ Jay David Bolter, *Writing Space: The Computer, Hypertext, and the History of Writing* (Hillsdale, NJ: Lawrence Erlbaum, 1991).

²² Robert Coover, "The End of Books," *New York Times*, June 21, 1992, <http://www.nytimes.com/books/98/09/27/specials/coover-end.html>.

²³ Landow, *Hypertext*, 10, 67-68, 72.

²⁴ Bolter, 137.

²⁵ See N. Katherine Hayles, "Deeper into the Machine: The Future of Electronic Literature," *Culture Machine* 5 (2003), <http://svr91.edns1.com/~culturem/index.php/cm/article/viewArticle/245/241> and also: "Electronic Literature: What Is It?," *The Electronic Literature Organization*, January 2 2007, <http://eliterature.org/pad/elp.html>. Hayles limits the category to "born digital" works, but that may be because none of the annotation projects I'm arguing also belong to it were ever completed. They generally fit her description of first-generation work.

²⁶ Denis Diderot, "The Encyclopedia," trans. Ralph H. Bowen, in *Rameau's Nephew and Other Writings* (Indianapolis: Hackett, 2001), 277.

²⁷ Quoted in Willa Anderson, "Encyclopedic Topologies," *MLN* 101.4 (1986): 912-929.

²⁸ Kevin Attell, "Encyclopedic Modernisms: Historical Reflection and Modern Narrative Form," University of California at Berkeley diss., 2003, 43.

²⁹ Landow, *Hypertext*, 10. The idea of prosthetically recreating the experience of reading with an educated mind is an idea that guides Landow's work on hypertext annotation, starting from the first paragraph of that 1989 paper (174).

³⁰ John Bishop, "A Metaphysics of Coitus in 'Nausicaa'" in *Ulysses: En-Gendered Perspectives*, eds. Kimberly J. Devlin and Marilyn Reizbaum (Columbia: University of South Carolina Press, 1999), 194-95.

³¹ *The Odyssey of Homer*, trans. Richmond Lattimore (New York: Harper & Row, 1965), 345.

³² This comes across very clearly in the discussion on the j-joyce listserv Groden led in November and December of 1998. A full transcript can be accessed through the *Internet Archive* at <https://web.archive.org/web/20030219083827/http://publish.uwo.ca/~mgroden/anno.html>.

³³ In an article reviewing thirty-eight studies on hypertext and cognition, Diana DeStefano and Jo-Anne LeFevre conclude there's "ample evidence that decision-making demands create additional cognitive load for hypertext readers," leaving them less working memory to bring to bear on their reading and undermining their comprehension of it—"Cognitive Load in Hypertext Reading: A Review," *Computers in Human Behavior* 23.3 (2007), 1631, 1635-36. Working memory is, one of the researchers who first described it explains, "the set of mental resources that people use to encode, activate, store, and manipulate information while they perform cognitive tasks" (A. D. Baddeley qtd. in DeStefano and LeFevre 1618).

³⁴ The full-episode prototype for "Digital *Ulysses*" was shown around by never published. However, Groden indicates this is the style of presentation he adopted for "Digital *Ulysses*" in Chamberlain's article and correspondence Marc C. Marino quotes in "Ulysses on Web 2.0: Towards a Hypermedia Parallax Engine," *James Joyce Quarterly* 44.3 (2007), 484-85.

³⁵ Groden, "James Joyce's 'Ulysses' in Hypermedia": Problems of Annotation," Clemson University, 2001, <http://www.clemson.edu/cedp/tech%20colloquium%202001/groden%20files/>.

³⁶ Heyward Erlich, "The James Joyce Text Machine," <http://andromeda.rutgers.edu/~ehrich/jjtm/>.

³⁷ See Landow, *Hypertext 2.0* (Baltimore: The John Hopkins University Press, 1997), 13-15, and *Hypertext 3.0* (Baltimore: The John Hopkins University Press, 2006), 16-18.

³⁸ David Gold, "Ulysses: A Case Study in the Problems of Hypertextualization of Complex Documents," *Computers, Writing, Rhetoric and Literature* 3 (1997).

³⁹ Steven Johnson, "Why Nobody Clicked on the Great Hypertext Story," *Wired*, 16 April 2013, <http://www.wired.com/2013/04/hypertext/#anchor-two>. Johnson quit a Ph.D. program in English at the height of Landow's influence the popularity of hypertext fiction to start *Feed*, one of the first online magazines.

⁴⁰ Joyce, *The Project Gutenberg EBook of Ulysses*, "produced by" Col Choat and David Widger, <http://www.gutenberg.org/files/4300/4300-h/4300-h.htm>. The entry for copyright in its metadata says, "Public domain in the USA."

⁴¹ Derrida, 281.

⁴² See, for example, Jeffrey Toobin, "Annals of Law: Google's Moon Shot," *New Yorker*, Feb. 5, 2007, and "So far Google Books Has Scanned 20 Million Volumes," *SFGate*, Nov. 16, 2013, and Robert Darnton's several pieces about the DPLA in the *New York Review of Books*.

⁴³ See Siva Vaidhyanathan, *The Googlization of Everything (And Why We Should Worry)* (Berkeley and Los Angeles: The University of California Press, 2011).

⁴⁴ See "About Google," <http://www.google.com/about/>, for example.

⁴⁵ Denis Diderot, “The Encyclopedia,” trans. Ralph H. Bowen, in *Rameau’s Nephew and Other Writings* (Indianapolis: Hackett, 2001), 277.

⁴⁶ Hayles, “How We Read: Close, Hyper, Machine,” *ADE Bulletin* 150 (2010), 66.

⁴⁷ Hayles points to Nicholas Carr’s book *The Shallows: What the Internet is Doing to Our Brains* (New York: Norton, 2010) as a valuable synopsis of research to this effect, though she goes over the primary research he cites and raises some questions about his presentation of it.

⁴⁸ Hayles, “How We Read,” 63-65. See also, for example, Michael Warner, “Uncritical Reading” in *Polemic: Critical or Uncritical*, ed. Jane Gallop (New York: Routledge, 2004), 13-38, Stephen Best and Sharon Marcus, “Surface Reading: An Introduction,” *Representations* 108.1 (Fall 2009), 1-21, and Franco Moretti, *Distant Reading* (London: Verso, 2013).

⁴⁹ Hayles, “Electronic Literature.”

⁵⁰ Jessica Pressman, *Digital Modernism: Making It New in New Media* (Oxford and New York: Oxford University Press, 2014), 2, 6-7.

⁵¹ Pressman, 2.

⁵² Marc C. Marino, “Ulysses on Web 2.0: Towards a Hypermedia Parallax Engine,” *James Joyce Quarterly* 44.3 (2007).

⁵³ See Darnton’s many articles and replies letters on the subject in the *New York Review of Books* from the past four years.

⁵⁴ See Gary Marcus, “The Web Gets Smarter,” *New Yorker*, May 23, 2012.

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