

# INTERFACE CULTURE

HOW NEW TECHNOLOGY  
TRANSFORMS THE WAY WE  
CREATE AND COMMUNICATE

STEVEN JOHNSON

BASIC  
  
BOOKS

A Member of the Perseus Books Group

1997

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## LINKS

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If the mid-nineties battle over Ebonics taught us anything, it's that the lexicon of popular idiom and slang is never quite what it appears to be on the surface. Colloquial speech gets a bad rap, but more often than not slang is where language happens. The influx of new terms and intonations keeps the word-world lively. (Think of the way Yiddish has enlivened urban American conversation.) But slang doesn't necessarily rely on phonetic innovation. Sometimes the most influential buzzwords come into popularity as crossover hits, appropriations—the way NASA jargon infiltrated the national vocabulary after the moon landing. Popular slang has borrowed heavily from the digital idiom in recent years: the ubiquitous “cyber-” prefix, the broad assault of “spamming.” (I've heard more than a few friends punctuate an especially profound statement with the exclamation, “Click on *that!*”) It's only fitting that Silicon Valley should serve up these new turns of phrase; having borrowed a handful of metaphors from the analog provinces, the digital idiom is now returning the favor.

But not all slang translations do justice to their new environments. Like the desktop metaphors of the graphic interface, colloquial phrases that hop from one context to

another run the risk of confusing matters. The familiarity of the phrase has an initial value, the way the desktop helped millions of users acclimate to the idea of information-space. But the analogy invariably has its limits. There are always threshold points and variations that separate the metaphor from the thing itself. Sometimes the gap is so wide that the translation obscures more than it reveals—like a desktop metaphor so convincing that we neglect the computer's miraculous aptitude for shape-shifting. In both interface design and popular slang, some migrations from one context to another just aren't worth the trip.

So it is with the verb *to surf* and all its variations: Web surfer, cybersurf, surfing the digital waves, silicon surfer. Not only are the iterations inane, but the concept of “surfing” does a terrible injustice to what it means to navigate around the Web. In this case, it's not the allusion to literal surfing that leads us astray—though the laid-back, Jeff Spicoli 'tude of most real surfers hardly corresponds to the caffeinated twitch of your average Webhead. What makes the idea of cybersurf so infuriating is the implicit connection drawn to television. Web surfing, after all, is a derivation of channel surfing—the term thrust upon the world by the rise of remote controls and cable panoply in the mid-eighties. Those aimless excursions across the landscape of contemporary TV—roaming from infomercial to C-SPAN to news bulletin to cartoon—were so unlike anything that had come before that a new term had to be invented to describe them. Applied to the boob tube, of course, the term was not altogether inappropriate. Surfing at least implied that channel-hopping was more dynamic, more involved, than the old routine of passive consumption. Just as a real-world surfer's enjoyment depended on the waves delivered up by the ocean, the channel surfer was at the mercy of the programmers

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Channel surfing

and network executives. The analogy took off because it worked well in the one-to-many system of cable TV, where your navigational options were limited to the available channels.

But when the term crossed over to the bustling new world of the Web, it lost a great deal of precision. Web surfing naturally came to be seen as an extension of the television variety, the old routine of channel surfing dressed up in high-tech drag. With that one link of association, a whole batch of corollary attributes wrapped themselves around the hapless Web surfer. We knew from countless pop-psychological treatises and op-ed pieces that channel surfers suffered from many ailments: they were prone to attention deficit disorder and ill-inclined to perceive causal relationships; they valued images over text, but rarely watched anything for more than a few minutes at a time. These were the pathologies of the channel surfer, and they were dutifully transferred to the channel surfer's Web-based kindred as soon as the phrase was coined. Thereafter, the two activities—roaming through the mediasphere via remote control and following links through cyberspace—became variations on the same theme. Neo-Luddites like Sven Birkerts and Kirkpatrick Sale offered up lamentations on the new generation of surf-addled zombies, bewitched by the disassociative powers of the remote control and hypertext, oblivious to the ordered, moral universe of linear narrative. Gen X advocates like Doug Rushkoff built up successful consulting careers by championing the improvisational skills of today's media-savvy "screenagers."

But both the Luddites and the GenXers were seriously misguided. Web surfing and channel surfing are genuinely different pursuits; to imagine them as equivalents is to ignore the defining characteristics of each medium. Or at least that's what happens in theory. In practice, the Web takes on the

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greater burden. The television imagery casts the online surfer in the random, anesthetic shadow of TV programming, roaming from site to site like a CD player set on shuffle play. But what makes the online world so revolutionary is the fact that there *are* connections between each stop on a Web itinerant's journey. The links that join those various destinations are links of association, not randomness. A channel surfer hops back and forth between different channels because she's bored. A Web surfer clicks on a link because she's interested. That alone suggests a world of difference between the two senses of "surfing"—a difference that contemporary media critics would do well to acknowledge.

Unfortunately, the media critics are only half the problem. Silicon Valley itself has proved to be just as inept when it comes to the new explorations of hypertext, most egregiously in recent start-ups like Netscape and Excite that owe their billions to the Web's overnight success. That success is a direct measure of the power and the promise of hypertext—all those links of association scattered across the infosphere—and yet most Web-specific start-ups have studiously ignored hypertext, focusing instead on the more television-like bells and whistles of grainy video feeds and twirling animations. There is no little irony in this state of affairs: companies that rose to prominence on the shoulders of hypertext ignore the links as soon as they go public, as though hypertext were just an afterthought, a passing fancy. You can see this strange neglect as yet another case of Silicon Valley striving for the Next Big Thing, its dialectical quest for ever more enthralling technologies. But you can also see it as a case of sawing off the branch you're sitting on.

This indifference to hypertext stems in part from the ill-suited adaptation of the "surf" idiom. The allusion to

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indifference to hypertext

TV flattened out the more engaged, nuanced sensation of pursuing links, made it harder to see the real significance of the experience, which then made it harder to imagine ways in which it could be improved. That neglect is no small matter. Consider just this one statistic: near the middle of 1996, Netscape and Microsoft released new versions of their respective Web browsers, setting some sort of informal record for the most rapid-fire software upgrades in history. These new versions between them unleashed more than a hundred new features, according to the press materials that accompanied them. There were upgrades for Java support, new animation types, sound plug-ins, e-mail filters, and so on. But not one of these new features—not one—enhanced the basic gesture of clicking on a text link. The very cornerstone of the World Wide Web had been completely ignored under a blizzard of other, gratuitous additions. For those of us who spend a great deal of time “surfing” online, the oversight was maddening. Ask any Web user to recall what first lured him into cyberspace; you’re not likely to hear rhapsodic descriptions of a twirling animated graphic or a thin, distorted sound clip. No, the eureka moment for most of us came when we first clicked on a link, and found ourselves jettisoned across the planet. The freedom and immediacy of that movement—shuttling from site to site across the infosphere, following trails of thought wherever they led us—was genuinely unlike anything before it. We’d seen more lively cartoon animations on Saturday-morning television; we’d heard more compelling audio piped out of our home stereos. But nothing could compare to that first link.

What we glimpsed in that first encounter was something profound happening at the level of language. The link is the first significant new form of punctuation to emerge

in centuries, but it is only a hint of things to come. Hypertext, in fact, suggests a whole new grammar of possibilities, a new way of writing and telling stories. But to make that new frontier accessible, we need more than one type of link. Microsoft and Netscape may be content with the simple, one-dimensional links of the Web’s current incarnation. But for the rest of us, it’s like trying to write a novel where the words are separated only by semicolons. (It might make for an intriguing avant-garde experiment, but you’re not going to build a new medium out of it.) Fortunately, the world of hypertext has a long history of low-level innovation. More than any other interface element, the link belongs to the cultural peripheries and not to the high-tech conglomerates. Even as the Netscapes of the world ignore hypertext, the novelists and site designers and digital artists are busy conjuring up the new grammar and syntax of linking.

As the word suggests, a link is a way of drawing connections between things, a way of forging semantic relationships. In the terminology of linguistics, the link plays a conjunctive role, binding together disparate ideas in digital prose. This seems self-evident enough, and yet for some reason the critical response to hypertext prose has always fixated on the disassociative powers of the link. In the world of hypertext fiction, the emphasis on fragmentation has its merits. But as a general interface convention, the link should usually be understood as a *synthetic* device, a tool that brings multifarious elements together into some kind of orderly unit. In this respect, the most compelling cultural analogy for the hypertext webs of today’s interfaces turns out to be not the splintered universe of channel surfing, but rather the damp, fog-shrouded streets of Victorian London, and the mysterious resemblances of Charles Dickens.

"Links of association" was actually a favorite phrase of Dickens. It plays a major role in the narrative of *Great Expectations*—arguably his most intricately plotted work, and the most widely read of his "mature" novels. For Dickens, the link usually takes the form of a passing resemblance, half-glimpsed and then forgotten. Throughout his oeuvre, characters stumble across the faces of strangers and perceive some stray likeness, something felt but impossible to place. These moments are scattered through the novels like hauntings, like half-memories, and it's this ethereal quality that brings them very close to the subjective haze of modernism and the stream of consciousness. Consider Pip's ruminations on his mysterious playmate and love interest Estella: "What was it that was borne in upon my mind when she stood still and looked attentively at me? . . . What was it? . . . As my eyes followed her white hand, again the same dim suggestion that I could not possibly grasp, crossed me. My involuntary start occasioned her to lay her hand upon my arm. Instantly the ghost passed once more and was gone. What *was* it?"

These partial epiphanies are more than just stylistic ornamentation—they serve as the driving force behind the suspense of Dickens's novels. Resolving the half-resemblance, connecting the links, putting a name to the face—these actions invariably give the novel its sense of an ending. They stand for the restoration of a certain orderliness in the face of tremendous disorder. (This is one way in which they mirror the "synthetic" connections of today's hypertext prose.) The "associative links" of the half-glimpsed resemblance are so central to Dickens because they unite his two major thematic obsessions: orphans and inheritances. In the Dickensian novel, the plight of being orphaned at an early age has the

same *sine qua non* quality that marital infidelity had in the French novel: you simply can't imagine the form surviving without it. The more complicated novels of the later years—*Bleak House*, *Our Mutual Friend*, *Great Expectations*—are teeming with abandoned children, surrogate parents, and anonymous benefactors. The Victorians have a reputation for family-values conservatism, but their most gifted novelist devoted his entire career to dissecting and recombining the family unit, with an inventiveness that would have impressed the Marquis de Sade.

For all the experimentation, of course, Dickens's novels eventually wind their way back to some kind of nuclear family. (It took another twenty years for *that* convention to give way.) And with this "rightful" restoring of the family unit comes another restoration, this one financial. Like almost every other nineteenth-century British novelist, Dickens incessantly structured his narratives around troubled inheritances. There are enough contested wills, anonymous benefactors, and entangled estates in the Victorian novel to keep all the lawyers in Chancery busy for another century altogether. Orphans, of course, made wonderful protagonists for these inheritance plots. In almost every novel, reuniting the dispersed family unit, discovering the links of filiation that connect the main characters—all this is bound up in the rightful disposition of some long-contested estate. What better way to tantalize the reader—haplessly trying to connect those long-separated family lines—than by offering up a suggestive, but unfulfilled resemblance, a hint of filiation. When the moment of realization finally arrives, it has the force of biology *and* capital behind it. It packs a wallop:

I looked at those hands, I looked at those eyes, I looked at that flowing hair, and I compared them with other hands, other eyes, other hair, that I knew of, and with what those might be after twenty years of a brutal husband and a stormy life. . . . I thought how one link of association had helped that identification in the theater and how such a link, wanting before, had been riveted for me now, when I had passed by a chance swift from Estella's name to the fingers with their knitting action and the attentive eyes. And I felt absolutely certain that this woman was Estella's mother.

What makes these links so striking—to the twentieth-century reader, at least—is the fact that they straddle radically different social groups. The family triangle unearthed at the end of *Great Expectations* is that of an escaped convict, a servant, and a young woman of means; in *Bleak House*, it is a baroness, an opium-addicted law stenographer, and an orphan girl brought up by a haute-bourgeois uncle. We know from the outset of each book that the family unit has been dispersed physically; we learn by the end that it has also been separated *economically*. The reconciliation between different social classes has the air of wish fulfillment to it, an imaginary solution—as Freud used to say—to a real contradiction.

There is a strong vein of sentimentality here, of course, but there is also something heroic. Dickens at least attempted to see the “whole” of society in his novels, building a form large enough to connect the lives of street urchins, captains of industry, schoolteachers, circus folk, ladies-in-waiting, convicts, shut-ins, dustheap emperors, aging nobility, and

rising young gentlemen. No novelist since has cast such a wide net. No novelist since has dared to try. That is in part because the forces unleashed by the Industrial Revolution had an enormously disassociative power: in the space of twenty or thirty years, they utterly transformed the lives of most British citizens, particularly those residing in the factory towns and the metropolitan center of London. The great burden that Dickens inherited was that of a society in which social roles were no longer clearly defined, where the old codes of primogeniture and noblesse oblige had given way to a dynamic, bewildering new regime, one that seemed to reinvent itself every few years. Certain social critics and historians of the time—most notably Engels and Carlyle—attempted to make sense of this new reality in works of nonfiction; Dickens built his explanatory narratives within the genre of the novel. But the divisions in the society were too broad, too severe, to be broached by ordinary storytelling. To see the relationship between a street orphan and a baroness, you needed a little magic, a little artifice. And so the link of association—leading us inexorably toward a secret history of heritage and inheritance—became the stock device of the Dickensian novel.

When we read the books a century later, the trope can seem forced, almost comical. That the Victorian reading public embraced these fanciful links with such devotion testifies to the divisiveness and the social confusion of the time. The preposterousness of the device suggests just how overwhelming the crisis really was. Dickens's genius—and the key to his popular success—was to understand that a culture so divided against itself could only seek resolution in fairy tales. The “links of association”—all those half-glimpsed resemblances, those partial hauntings—were the building blocks of

that fantasy. Their high-tech descendants serve an equivalent purpose today. Where Dickens's narrative links stitched together the torn fabric of industrial society, today's hypertext links attempt the same with information. The imaginative crisis that faces us today is the crisis that comes from having too much information at our fingertips, the near-impossible task of contemplating a colossal web of interconnected computers. The modern interface is a kind of corrective to this multiplying energy, an attempt to subdue all that teeming complexity, make it cohere. And on the World Wide Web, where this imaginative crisis is most sorely felt, it is the link that finally supplies that sense of coherence, like the families reunited at the close of *Bleak House*, or *Hard Times*, or *Great Expectations*. Today's orphans and itinerants are the isolated packets of data strewn across the infosphere. The question is whether it will take another Dickens to bring them all back home again.

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As is true for so much in the digital world, the modern practice of linking originates in the creative aftermath of World War II. Not surprisingly, it arose specifically as a response to a perceived crisis of information overload, a crisis set in motion by the extraordinary research explosion of the war years. With so much new data floating around—so many new discoveries, experiments, hypotheses—how were scientists going to make sense of it all?

The question arrives at the very outset of Vannevar Bush's "As We May Think" essay. The problem, as Bush conceived it, was one of discontinuity: our knowledge-creating tools had advanced faster than the knowledge-processing ones. Plenty of information was being generated out there; we just didn't know where to find it. Fifty years before Netscape Navi-

gator, Bush drew on a nautical metaphor to express the thought, already hinting at the provocative idea of information-space: "The summation of human experience is being expanded at a prodigious rate, and the means we use for threading through the consequent maze to the momentarily important item is the same as was used in the days of square-rigged ships." As a corrective to this plight, Bush proposed an information speedboat of sorts, a device that was half microfilm machine and half computer. He called it the Memex.

It consists of a desk, and while it can presumably be operated from a distance, it is primarily the piece of furniture at which [the user] works. On the top are slanting translucent screens, on which material can be projected for convenient reading. There is a keyboard, and sets of buttons and levers. Otherwise it looks like an ordinary desk.

In one end is the stored material. The matter of bulk is well taken care of by improved microfilm. Only a small part of the interior of the memex is devoted to storage, the rest to mechanism. Yet if the user inserted 5000 pages of material a day it would take him hundreds of years to fill the repository, so he can be profligate and enter material freely.

Most of the memex contents are purchased on microfilm ready for insertion. Books of all sorts, pictures, current periodicals, newspapers, are thus obtained and dropped into place. Business correspondence takes the same path. And there is provision for direct entry.

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We will return to Bush's mechanical blueprint for the Memex in the concluding chapter, but for now let us consider his navigational device. Information *storage*, after all, isn't the problem here, as Bush pointed out in his opening argument. We have plenty of "summation" lying around, whether it's on our desktop or in the local library; what we don't have is a way of "threading" through all that data. Bush's proposed solution should probably go down in history as the birth of hypertext, at least in its modern incarnation. Only he chose to ~~imagine~~ the "links of association" connecting all that data as "trails," not links. At one point, he even refers to experienced Memex users as trailblazers—a term that would have fitted well with the "new frontier" rhetoric of recent cyber-boosterism. It certainly would have been an improvement on the couch-potato passivity of the "surfing" argot.

118 At first glance, trails appear to have much in common with the modern link; they serve as a kind of connective tissue, an information artery, that threads together documents with some shared semantic quality. Trails, in other words, are a way of organizing information that doesn't follow the strict, inflexible dictates of the Dewey decimal system or other hierarchical conventions. Documents can be connected for more elusive, transient reasons, and each text can have many trails leading to it. Our traditional ways of organizing things—library books, say, or physical elements—are built around fixed, stable identities: each document belongs to a specific category, just as each element has a single block on the periodic table. Bush's system was closer to those half-resemblances of Dickens's novels: links of association, tantalizing, but not fully formed.

This implied a profound shift in the way we grapple with information. The previous century had been dom-

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inated by the encyclopedic mentality (famously parodied in Flaubert's slapstick novel *Bouvard et Pécuchet*) in which the primary goal of information management was to find the proper slot for each data package. Bush turned that paradigm on its head. What made a nugget of information valuable, he suggested, was not the overarching class or species that it belonged to, but rather the *connections* it had to other data. The Memex wouldn't see the world as a librarian does, as an endless series of items to be filed away on the proper shelf. It would see the world the way a *poet* does: a world teeming with associations, minglings, continuities. And the trails would keep that radiant universe bound together.

What Bush described was essentially a literary view of the world, one probably best realized in Bloom's rambling internal monologue in *Ulysses*, and in the associative free-for-all of most surrealist writing. Recent advances in neuroscience suggest, though, that Bush's connective model may be a mechanical analog of the way the brain works: an intricate assemblage of neurons connected by trails of electrical energy, generating information out of connections rather than fixed identity. It's not as if the brain reserves a specific chunk of physical real estate for the idea of "dog" and another for "cat." The ideas emerge out of thousands of separate neurons firing, in combinations that reorganize themselves with each subtle shift in meaning. The connections between those neurons create the thought; the individual neurons are just building blocks.

Part of Bush's vision for the Memex looks uncannily like our present-day experience of the Web, with a predictably heavy emphasis on the research benefits promised by the new technology, and little attention paid to more, shall we

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say, *recreational* pursuits. (You get the sense that Dr. Bush would have had a hard time adjusting to the “trails” connecting the subcultures of online porn.) Sections of his essay read like a run-of-the-mill, late-nineties AT&T ad, or an overenthused product review in *Wired*:

The patent attorney has on call the millions of issued patents, with familiar trails to every point of his client’s interest. The physician, puzzled by his patient’s reactions, strikes the trail established in studying an earlier similar case, and runs rapidly through analogous case histories, with side references to the classics for the pertinent anatomy and histology. The chemist, struggling with the synthesis of an organic compound, has all the chemical literature before him in his laboratory, with trails following the analogies of compounds, and side trails to their physical and chemical behavior.

The scenarios sound like a feasible description of today’s online databases and vertical-market CD-ROMs—though as always, the promise of “information at your fingertips” works better on paper than it does in real life. (The gap is probably forgivable in this one instance, considering that the Memex itself was the ultimate in vaporware.) But if part of Bush’s vision anticipates the present-day shape of the World Wide Web, another part greatly exceeds it. Despite the fury of innovation and the massive R&D expenditures of the past decades, one of the Memex’s essential features remains off-limits to most contemporary Web browsers. Consider this description:

The owner of the memex, let us say, is interested in the origin and properties of the bow and arrow. . . . He has dozens of possibly pertinent books and articles in his memex. First he runs through an encyclopedia, finds an interesting but sketchy article, leaves it projected. Next, in a history, he finds another pertinent item, and ties the two together. Thus he goes, building a trail of many items. Occasionally he inserts a comment of his own, either linking it into the main trail or joining it by a side trail to a particular item. When it becomes evident that the elastic properties of available materials had a great deal to do with the bow, he branches off on a side trail which takes him through textbooks on elasticity and tables of physical constants. He inserts a page of longhand analysis of his own. Thus he builds a trail of his interest through the maze of materials available to him.

Anyone who has spent any time roaming across the Internet will immediately recognize the difference here. Bush’s Memex owner *builds* that “trail of interest” as he explores the information-space on his desk. Surfers, as a rule, *follow* trails of interest, through links that have been assembled in advance by other folks: designers, writers, editors, and so on. The Web surfer depends on the charity of others for his associative links; the “trailblazer” rolls his own. And most important, the trails endure. They remain part of the Memex’s documentary record; the connection between the bow and the principles of elasticity isn’t simply strung together momentarily, only to

be discarded hours later. The connection remains permanently etched onto the Memex's file system. Five years after this initial research, a return to the material on elastics might send our Memexer off to the bow-and-arrows article, or deliver up his long-forgotten notes on the subject. That accumulated record of past trails means that the device grows smarter—or at least more associative—the more you use it, as the file system is laced together by thousands of associative trails.

Your average Nethead can create bookmarks, of course, but these are just momentary excerpts from a longer train of thought, like snapshots or postcards mailed home from an overseas vacation. The journey itself—the movement from thought to thought, document to document—is the key here. Bookmarking a single page barely scratches the surface. Most of us carry around bookmark files littered with random sightings, recommendations, favorite locales, secret hideaways, and so on. It's a remarkably personal, idiosyncratic list. (Trading bookmark files—one of the first rituals to develop in Web culture—has a wonderfully confessional quality to it, like letting someone eavesdrop on your therapy sessions.) But despite their personalized texture, those bookmarks have no connection to one another. They're isolate units, monads. You can create a master list of all your favorite resources, but there's no way to describe the relationships between them, the links of association that make that personal web intelligible to you.

The Memex was designed to organize information in the most intuitive way possible, based not on file cabinets or superhighways but on our usual habits of thinking—following leads, making connections, building trails of thought. Bush wanted the Memex to respond to the user's worldview; the trails would wind their way through docu-

ments in varied, idiosyncratic ways, threading through the information-space at the user's discretion. No two trails would be exactly alike. The Web has realized much of Bush's vision, but the core insight—the need for a trail-building device—remains unfulfilled, at least on the Internet. (Several groupware products—Lotus Notes, for example—have come close to the Memex's trail-building technology.) Most Web browsers still dutifully follow the links that are served up to them, without any means of creating their own associative trails in return. The Web should be a way of seeing new relationships, connecting things that might have otherwise been kept separate. Clicking on other people's links may be less passive than the old, sedentary habit of channel surfing, but until users can create their own threads of association, there will be few genuine trailblazers on the Net.

The irony here, of course, is that a middle-aged army scientist, writing thirty years before the first PC, understood interactivity better than all the Web titans in Silicon Valley. Perhaps this shouldn't come as a surprise. After all, sometimes the best way to understand a technology is to approach it with no expectations, no preconceived ideas. Unhampered by any historical precedent, Bush was free to conjure up a device for “augmenting” thought based on his own flights of fancy. Today's technologists may be too trapped within the “surfing” paradigm—clicking absentmindedly on links supplied by others—to recognize the value of being able to link back, to blaze your own trail through information-space.

We may be anesthetized to it now, but the truth is, clicking on links once had a certain air of sedition to it, back in the early days of hypertext, before the overnight success of the World

Wide Web. Hypertext first captured the public's imagination as a literary genre, most famously in Michael Joyce's 1993 work, *Afternoon, A Story*. The modest title concealed a labyrinth of narrative passageways, winding across one another, or snaking back to their origins. (Hypertext writers tend to play up their prepositions a great deal; the literature abounds with quirky, precious phrases such as "reading through and over the text.") Like most interface advances, this new form had a politics to it, though in this case the rhetoric of liberation was a little closer to the surface. Hypertext advocates drew on a tradition that dated back to the literary theorists of the sixties, to essays like Roland Barthes's influential "Death of the Author." The Parisian *philosophes* of '68 had called for a revolution in reading habits, a kind of grassroots aestheticism wherein the *reader* shapes the experience of a text more than the author does.

In its original iteration, this "reader's revolt" was mostly a figure of speech, and a self-aggrandizing one at that. In its most elemental form, it argued that the critic—and not the author—had the final say in what a book "meant," and because there were many critics out there, each lugging along a competing interpretation, it was unlikely that the book would ever arrive at a unified, stable meaning. There was some truth to be found amid all the manifestos and tortured syntax. (Surely all great works of art possess multiple levels of meaning, levels that are brought out by the aptitudes and inclinations of the audiences that receive them.) But all too often, the "death of the author" came across as a case of self-interested ressentiment. "Reader centrism" translated into "critic centrism," which translated into tenured faculty positions and high-priced lecture tours.

Hypertext fiction could go beyond all that, its advocates argued. It would literalize the metaphor of the

"reader's revolt." Hypertext would be a more egalitarian form, where the reader would create the narrative by clicking on links and following different story lines, like the old "choose your own adventure" children's books. The work itself would be less like a narrative in the strict sense of the word, and more like an environment. (It was no accident that the first authoring software for hypertext fiction was called Story-Space.) *Afternoon, A Story* was widely hyped as a harbinger of this great textual revolution, and it was scrutinized like tea leaves or sheep entrails for signs of things to come.

As it turned out, *Afternoon* didn't make for a particularly good case study. The writing itself was fairly experimental; you got the sense that it would have remained disconcertingly nonlinear had it been published in traditional book form. It was a bit like watching a Godard film with a projectionist who insists on randomly swapping reels. The links between different pages seemed more anarchic than free-associative; the idea of an overarching narrative dropped out altogether, and what you were left with resembled a collection of aphorisms more than anything else. You couldn't help wondering how a John Grisham novel would fare in the medium, where a strong narrative might make your reading "choices" more consequential.

One casualty of hypertext (at least in Joyce's hands) was that old, time-honored sense of an ending. I had assumed from the outset that *Afternoon* would offer many potential endings, but a few readings of the story left me with the sense that "closure"—as Joyce calls it in the introduction—had been abandoned wholesale. "When the story no longer progresses," he wrote, "or when it cycles, or when you tire of the paths, the experience of reading it ends." This is closure as

entropy rather than resolution; the story stops when it bores you. Hypertext advocates saw this as another way of empowering the reader at the author's expense, though that line always sounded a little suspicious to me. I remember as a teenager "ending" *Crime and Punishment* halfway through the novel precisely because I had "tired of its paths." Had I known then about the politics of hypertext, I might never have made it past the first chapter.

There is another limitation to hypertext fiction's liberation theology. The politics of reading, after all, aren't simply a matter of a confrontation between author and reader. There's also that other, crucial dimension: the readers' shared experience, the broader social bond that develops out of having read the same narratives. This shared experience was an essential component of Dickens's success as a novelist. The links of association bound together not only the disparate social universes of his characters, all those ruffians, ladies-in-waiting, stockbrokers, and day laborers. They also bound together a nation of readers. Without that collective resonance, the faint, reassuring rustle of a thousand fingers turning the same pages in unison, Dickens's imaginary resolutions would have lost their force. And herein lies the great distinction between the Dickensian link and its hypertext descendants. Dickens's links worked in the service of unification, welding together the fictional lives of his characters as well as the imaginations of his readers. Joyce's links proceed in the opposite direction. They fragment the reading experience, scatter it into hundreds of variations, to the point where every reading conjures up a different story.

There's something thrilling about that new openedness, but also something profoundly lonely. After I fin-

ished with *Afternoon*, I rang up a few friends who had also meandered through it, looking for feedback. In each phone call, we talked excitedly for a minute or two about the medium and its possibilities, but the second we turned to the content of the story, the conversation grew stilted and uneven. We were talking, it turned out, about very different stories. Each reading had produced an individual, private experience. At these moments, struggling for common ground over the telephone, hypertext felt less like an exercise in literary democracy and more like an isolation booth.

Although the hypertext soothsayers were right to sense something significant brewing in the new grammar of links, most of them were thinking on the wrong scale. Hypertext was supposed to revolutionize the way we tell stories, but it ended up transforming our *sentences* instead. Nowhere is this more apparent than in the World Wide Web itself—now the great breeding ground for hypertext innovation. The Web first drifted into prominence near the end of 1994, just as the public fascination with nonlinear fiction was hitting a high point. Joyce had been named to *Newsweek's* list of digital savants; the *New York Times Book Review* had run several extended essays on hypertext novels, laced with the obligatory references to Cortázar and Calvino; Sven Birkerts had published his assault on the forking paths of nonlinear narrative, *The Gutenberg Elegies*. The Web was seen as a logical continuation of this trend: a global medium for hypertext narrative. Soon we'd all be navigating through elaborate storyspaces on our desktop PCs, stitching our own tailor-made plots together with each mouse click. Journalists would file stories in a more three-dimensional format—as an array of possible combinations rather than a unified piece.

The links would transform our most fundamental expectations about traditional narrative. We'd come to value environment over argument, shape-shifting over consistency.

But looking back now, after a few years of press releases and vaporware, what strikes you is how little of this came to pass. The great preponderance of Web-based writing is unapologetically linear. Almost all journalistic stories are single, one-dimensional pieces, articles that would be exactly the same were they built out of ink and paper instead of zeros and ones. (Many of them, of course, are simply digital versions of print originals.) If there is reader-centric navigation, it comes from hopping from article to article and from site to site. The individual articles themselves rarely offer any navigational options at all. Links do appear in some articles, but they're usually pointing to the Web sites of companies that happen to be mentioned in the piece—yet another way of accentuating brand identity, like a registered trademark or a logo. This is a particularly mindless use of hypertext. Illuminating a passing reference to Apple Computer with a link to "www.apple.com" might create the appearance of hypertext prose, but in actuality it's gratuitous, yet another case of digital window dressing. Finding a corporate Web site is one of the easiest tasks on the Web: it usually involves tacking a ".com" suffix onto the company's name and punching that into your browser. Reading an article about Apple Computer doesn't make you want to check out its home page; it makes you want to read other, related articles on the same topic, or zoom in on one particularly tantalizing idea, or click over to a reader discussion about the company's future.

To be fair, a handful of Web publishers have integrated "related reading" pointers into their articles, though

there is a strange compulsion to keep those links separated from the primary text. (Slate, for instance, trots out its links at the end of each article.) Other, community-driven sites—like HotWired and Electric Minds—feature excerpts from reader commentary in the margins of the top-level articles. But even the more adventurous, envelope-pushing sites like Word seem more preoccupied with multimedia frills than with associative links. When Stefanie Syman and I first designed FEED, we included two sections—Document and Dialog—that relied extensively on the new dimensions of hypertext. Document allowed readers and contributors to attach their own commentary to a primary text, like birds perched on the backs of lumbering elephants. Dialog deposited a panel of critics in a "conversation space," where each written remark led off in several directions; one sentence might generate a string of rebuttals and counterrebuttals, while another sentence might lead off to a mild clarification from the original author, or to a missive sent in by a reader. You didn't read so much as *explore* the Dialog, and like most interesting spaces, you'd stumble across a new passageway every time you went back to it. This was journalism for trailblazers, we thought, and we assumed that other Web publications would soon adopt similar journalistic storyspaces.

But two years later, the FEED Dialog remains one of the Web's most complex hypertext environments, at least among the mainstream publications. (More serpentine structures have been built on the margins of avant-garde fiction by hypertext trailblazers like Carolyn Guyer and Mark Amerika.) It may be that readers genuinely prefer the ordered, author-centric direction of traditional storytelling, and so more complex structures will remain the exception to the rule. But my hunch is that the appetite for nonlinear prose will grow as we

acclimate ourselves to these new environments—and to the strange new habits of reading that they require. Here again the legacy of channel surfing has done the Web a great disservice. The metaphor suggests a certain agitated indifference, zapping randomly from source to source. But moving through a hypertext space, following links of association, is an intensely focused activity. Channel surfing is all about the thrill of surfaces. Web surfing is about depth, about wanting to know *more*. But if you can't see that distinction, if you imagine the mouse as the poor cousin of the remote control, then of course you're not going to create documents that fully exploit the power of hypertext. There's plenty of programming designed for trigger-happy surfers on MTV; why bother lowering yourself to that common denominator on the Web?

Fortunately, ill-advised metaphors can't possibly curtail *all* innovation, particularly with a medium as democratic as the Web. As it turns out, the most interesting advances have taken place on the micro level of syntax, rather than the macro level of storytelling. This is one of those wonderful occasions—frequent in high-tech history—when the pundits and trendspotters have us looking in one direction and the exciting stuff ends up happening somewhere else. Hypertext links were supposed to be a storytelling device, but their most intriguing use has proved to be more syntactical, closer to the way we use adjectives and adverbs in our written language. The link was going to engender a whole new way of telling stories. It turned out to be an element of style.

Nowhere is this more apparent than in the irony-drenched column of Suck. Launched anonymously by a pair of Unix hackers in the HotWired basement, Suck is now generally regarded as the ultimate do-it-yourself, self-publishing success

story in the Web's short history. The daily column took aim at the Web's relentless march toward the commercial mainstream (this was still news at the time), riffing caustically on the bloated, straining-to-be-visionary pronouncements of the "digital elite" or the inane online brochures of most corporate Web sites. The Sucksters liked to play themselves off as slackers and malcontents, lacing their columns with crack-smoking jokes and references to their being "postliterate." But the bad-boy posturing couldn't mask the intelligence and inventiveness of the prose, with its elliptical phrasing and penchant for extended metaphors. This onscreen style was both a curse and a blessing. The columns invariably sounded wonderful on first reading, but the layering of rhetoric made it difficult to pin down exactly what it was they were saying. Despite all the Budweiser jokes, what came to mind reading Suck was the cagey, intricate language of literary theory, the willed evasiveness of someone trying to use language to talk about how language doesn't work.

For a long time, I was puzzled by my return visits to Suck. Too many times the prose had seemed deliberately obscure, as if it were actively trying to repel its audience, inundating them with in-jokes, pop-culture references, French theory, and bathroom humor. Certain sentences had a kind of elusive, shimmering quality to them, as if you were seeing them at a great distance. You sensed that a tangible meaning lurked in the mix—if only you had the time to disentangle all the subsidiary clauses, parse out all the throwaway references. Consider this obtuse, but representative, example:

*In the new infomockracy, the cafe tables have been overturned. The stiff's chained to hollowed-out*

*terminals are now on the bleeding edge, while the most observed of old-line cultural observers are merely blunted. No more reheeling your Manolo mules every three weeks—a lack of mobility confers an advantage. Though boxed into cubicles, the new counterparts of Whether Overground footsoldiers have freer, faster access to the entrails and tea leaves of hipster life.*

132 Normally, of course, I'd have little patience with the onslaught of mixed-metaphor allusions, particularly on a Web site. But I found myself returning to the Sucksters, not so much to read what they had to say, but to figure out how they were saying it. After a few weeks of study, I began to realize that the uncanny, ethereal quality of the prose—particularly uncanny given the earthiness of the words themselves—was a side effect of the links. Like the passing resemblances of *Great Expectations*, the links triggered that sense of mystery, the sense of a code half-deciphered.

Suck's great rhetorical sleight of hand was this: whereas every other Web site conceived hypertext as a way of *augmenting* the reading experience, Suck saw it as an opportunity to withhold information, to keep the reader at bay. Even the sophisticated Web auteurs offered up their links the way a waiter offers up fresh-ground pepper: as a supplement to the main course, a spice. (Want more? Just click here.) The articles

themselves were unaffected by the "further readings" they pointed to. The links were just addenda, extensions of the primary argument. The Sucksters took the opposite tack. They used hypertext to condense their prose, not expand it. The benefits were clear: they could move faster through their sentences if they linked out strategically to other documents. They didn't need to spell out their allusions; they could just *point* to them and leave it up to the reader to follow along. So they left things out, and let the trails do the work. They buried their links mid-sentence, like riddles, like clues. You had to trek out after them to make the sentence cohere.

The rest of the Web saw hypertext as an electrified table of contents, or a supply of steroid-added footnotes. The Sucksters saw it as a way of phrasing a thought. They stitched links into the fabric of their sentence, like an adjective vamping up a noun, or a parenthetical clause that conveys a sense of unease with the main premise of the sentence. They didn't bother with the usual conventions of "further reading"; they weren't linking to the interactive discussions among their readers; and they certainly weren't building hypertext "environments." (Each Suck article took the resolutely one-dimensional form of a thin column snaking down an austere white page.) Instead, they used links like modifiers, like punctuation—something hardwired into the sentence itself. Most hypertext follows a centrifugal path, forcing its readers outward. The links encourage you to go somewhere else. They say, in effect: When you're done with this piece, you might want to check out these other sites. More sophisticated hypertext story-spaces say: Now that you've enjoyed this particular block of text, where would you like to go next? Suck, on the other hand, pointed its readers outward only to pull them back in, like

Pacino's tragic dance with the Mob in the *Godfather* trilogy. The links were a way of cracking the code of the sentences; the more you knew about the site on the other end of the link, the more meaningful the sentence became.

In its simplest form, Suck's hyperlinks worked the way "scarequotes" work in slacker idiom. They labored in the service of irony, undermining the seriousness of the statement, like a defense mechanism or a nervous twitch. Suck was notorious for linking to *itself* at any mention of crass commercialism or degeneracy. You'd see *sellout* or *jaded* highlighted in electric blue, and you'd click dutifully on the link—only to find yourself dropped back into the very page you were originally reading. The first time it happened, you were likely to think it was a mistake, a programmer's error. But after a while, the significance of the device sank in. By linking to itself, Suck broke with the traditional, outer-directed conventions of hypertext: what made the link interesting was not the information at the other end—there was no "other end"—but rather the way the link insinuated itself into the sentence. Modifying "sellout" with a link back to themselves was shorthand for "we know we're just as guilty of commercialism as the next guy"—in the same way that scarequotes around a word is shorthand for "I'm using this term but I don't really believe in it." The link added another *dimension* to the language, but not in the storyspace sense of the word. You never felt that you were exploring a Suck piece or navigating through an environment. You were just reading, but the sentences that scrolled down the screen had a strange vitality to them. They were more resonant somehow, and the hypertext shorthand allowed them to do much more with less.

The self-referential links were actually the easiest codes to decipher. Other combinations took more effort.

Consider this sentence from an end-of-the-year column. It read, at first, like a seasonal good tidings from one Web publication to another, but once you unraveled all the links, the words took on a darker, more cutting tone. "We are pleased to see that FEED is still worth the effort, though occasionally extraneous." It's an intelligible enough phrase, if a little vague. But reading the sentence through the lens of hypertext sharpened the image noticeably. The word *effort* pointed to an article we had run at FEED critiquing the WebTV product by Sony and Philips; the word *occasionally* linked to a Suck piece, penned months earlier, on the same topic. *Extraneous* pointed to another Suck article that predated ours—this one less critical of WebTV. When you added it all up, the "meaning" of the sentence was a good deal more complicated than the original formulation. Like one of Freud's dream studies, the sentence had a manifest and a latent content. The former was clear-cut, straightforward: "We are pleased to see that FEED is still worth the effort, though occasionally extraneous." The latter was more oblique, something like: "We're still fans of FEED, though they tend to be about two months behind us, and they tend to rip off our ideas when they finally catch up—like this WebTV travesty." As in the dream work of psychoanalysis, the latent content had a way of infecting the manifest content. After you deciphered the links, the phrase *worth the effort* began to sound more and more derogatory, as though the readers were laboring under the "effort" rather than being rewarded for it.

It may sound like an unlikely comparison, given Suck's postliterate pretensions, but what these passages remind me of are the famous lines from Wallace Stevens's "Thirteen Ways of Looking at a Blackbird":



*I do not know which to prefer,  
The beauty of inflections  
Or the beauty of innuendoes.*

Stevens describes the gap between literal language ("the beauty of inflections") and those subtle but still meaningful silences *between* words, their resonance, their beautiful innuendo. Suck's hypertext links seem to me to straddle that gap. They hover over the language, shadow it, part inflection and part innuendo. Who can say where the literal meaning lies? You can read the sentence straight, ignoring the links altogether, and it will indeed make sense, though you can't help but feel that something has been lost in the translation. But it's just as hard to imagine the links as an integral part of the sentence's meaning, as integral as the words themselves. Wouldn't that be a whole new way of writing? And even if we *are* witnessing the birth of a new type of language, surely it's not the offspring of a bunch of postliterate hackers?

Suck's use of hypertext is actually a bit less momentous in its implications, and a bit more encouraging. Making sense of those links brings us full circle, all the way back to the restricting language of Web surfing. What you can see in Suck's oblique syntax is not the birth of a new language, but rather the birth of a new type of *slang*. It's a jargon, but it's not built out of words or phrases. It's the slang of associations, of relationships between words. The slang evolves out of the way you string together information, the way you make your references, and not the words you use. If punctuation can become an element of slang (think scarequotes again), then why not links?

My guess is that old Vannevar Bush would have been delighted with the layered, associative syntax of Suck—despite the slacker invectives. Nothing could be healthier for the future of hypertext than a bunch of kids wrestling around with new intonations, new twists on old habits. That's what keeps language moving, after all—whether it's oral, print, or digital. The Netscapes and Microsofts of the world may ignore hypertext for years to come, but as long as the forces of popular idiom keep churning out the innovations, the dream of the Memex will continue to grow more vivid, more lifelike.

And yet for all their significance, links are not the only linguistic component of the modern interface. The demise of the command-line regime may have dealt a mortal blow to the supremacy of text over image in interface design, but simple words still play an enormous role in the contemporary interface. If anything, that role looks to become more critical to our information-spaces in the next decade, for reasons that are only now becoming apparent. The next chapter makes the case for the renewed importance of text in future interface designs, but it begins with the digital revolution's most influential gift to written language so far: the word processor.