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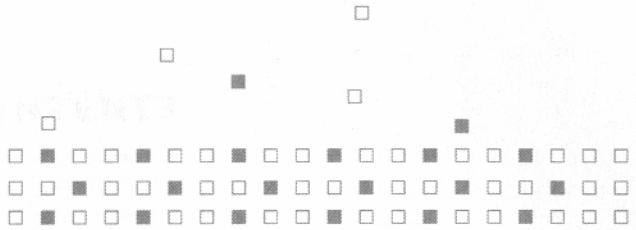

DAVID WEINBERGER

SMALL PIECES LOOSELY JOINED

{a unified theory of the web}

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PREFACE

IN LATE 1993, one of the programmers at the software company where I was vice president of strategic marketing called me into his office. "You have to see this," he said, pointing to his computer screen, standing as I sat, drumming his fingers anxiously on his thighs. There was an ugly gray document in an ugly window labeled "Mosaic." In the middle of the ugly black text was a phrase, underlined and in bright blue. "It's a link," my friend said. He clicked on it, and a new document took its place. The document might well have been titled "Your Company's New Product Is Doomed." I rounded up as many other members of the management team as I could find and brought them in to see what I had seen, and watched the blood drain from their faces as it undoubtedly had from mine.

It's not that we were shocked by the idea of links. Quite the contrary. We had recently launched a product that let users publish their documents online and embed links in them. Plus, our software had capabilities far beyond those of Mosaic. As we stared at the programmer's screen, we reminded ourselves of those differences: publishers could control the layout of the

page, could embed graphics of many sorts, and could use multiple columns. We also had a powerful set of tools for creating the documents in the first place, automatically building hyperlinked indexes and tables of contents. So, this little Mosaic viewer wasn't a real threat. Oh, it was a nice enough toy, but the big-time corporations we were dealing with—aircraft manufacturers, pharmaceutical companies, multinationals that practically had their own governments—wouldn't be satisfied with such a dinky little piece of software.

Thus did denial set in. That dinky browser, the progenitor of Netscape, may have lacked the bells and whistles of our software, but it had something from the start that our software would never have: openness. With our software, a publisher could embed a link from one document to another, but the publisher had to own both documents. That's fine if you're putting together a set of aircraft maintenance manuals and you want to make all the cross references active, so that clicking on one brings up the page to which it's referring. But those links had to be compiled into the system. Once the document was published, no more links could be added except by recompiling the document. And, most important, the only people who could add new links were those working for the publisher. If you were an aircraft mechanic who had discovered some better ways to clean a fuel line, you had no way to publish your page with our system and no way to link it to the appropriate page in the official manual.

The Web, on the other hand, breaks the traditional publishing model. The old model is about control: a team works on a document, is responsible for its content and format, and releases it to the public when it's been certified as done. Once

it's published, no one can change it except the original publisher. The Web ditches that model, with all its advantages as well as its drawbacks, and says instead, "You have something to say? Say it. You want to respond to something that's been said? Say it and link to it. You think something is interesting? Link to it from your home page. And you never have to ask anyone's permission." Then it adds: "And how long will it take to do this? I dunno. How fast do you type?" By removing the central control points, the Web enabled a self-organizing, self-stimulated growth of contents and links on a scale the world has literally never before experienced.

The result is a loose federation of documents—many small pieces loosely joined. But in what has turned out to be simply the first cultural artifact and institution the Web has subtly subverted, the interior structure of documents has changed, not just the way they are connected to one another. The Web has blown documents apart. It treats tightly bound volumes like a collection of ideas—none longer than can fit on a single screen—that the reader can consult in the order she or he wants, regardless of the author's intentions. It makes links beyond the document's covers an integral part of every document. What once was literally a tightly bound entity has been ripped into pieces and thrown into the air.

What the Web has done to documents it is doing to just about every institution it touches. The Web isn't primarily about replacing atoms with bits so that we can, for example, shop online or make our supply chains more efficient. The Web isn't even simply empowering groups, such as consumers, that have traditionally had the short end of the stick. Rather, the Web is changing our understanding of what puts things

together in the first place. We live in a world that works well if the pieces are stable and have predictable effects on one another. We think of complex institutions and organizations as being like well-oiled machines that work reliably and almost serenely so long as their subordinate pieces perform their designated tasks. Then we go on the Web, and the pieces are so loosely joined that frequently the links don't work; all too often we get the message (to put it palindromically) "404! Page gap! 404!" But that's okay because the Web gets its value not from the smoothness of its overall operation but from its abundance of small nuggets that point to more small nuggets. And, most important, the Web is binding not just pages but us human beings in new ways. We are the true "small pieces" of the Web, and we are loosely joining ourselves in ways that we're still inventing.

So now you know where this book's title comes from. The subtitle is a different issue. The "unified theory of the Web" it promises is quite similar to the unified theory of physics from which I derived its name—but only in that both are nonexistent.

I toyed with maintaining that my unified theory of the Web is that the Web consists of many small pieces loosely joined. But this would have put it in the same category as Ann Elk's Theory of the Brontosaurus as explained in a Monty Python sketch. After much ahem-ing, John Cleese, as Ms. Elk, pronounces her theory:

> My theory by A. Elk. Brackets Miss, brackets. This theory goes as follows and begins now. All brontosauruses are thin at one end, much thicker in the middle and then thin again at the far end. That is my theory, it is mine, and belongs to me and I own it, and what it is too.[1]

While "The Web consists of many small pieces loosely joined" may be only slightly more helpful than Ann Elk's contribution, this book does suggest a way of thinking about the Web that, although not as rigorous as a unified theory, will, I hope, help drive the conversation deeper. I'm one of those who believe that we can be individuals only because we are members of groups. Our families, our communities, and our culture make us what we are. And once we are what we are, we are still unthinkable outside the groups with whom we live; maroon us on a desert isle, and we'll form an association with a volley ball if we have to. So if a new infrastructure comes along that allows us to connect with everyone else on the planet and to invent new types of connections, this is big news indeed.

Even so, the conversation needs to take one step more. Our social connections until now have almost all been constrained by geography and atoms: the real world. These constraints feel natural to us because that's exactly what they are. They're so natural that they're usually invisible: it's inconspicuously true that we generally have to travel longer to get to places that are farther away; that to be heard at the back of the theater, you have to speak louder; that when a couple moves apart, their relationship changes; that if I give you something, I no longer have it; that our presence in the world is continuous from birth until death. Our every social act implicitly conforms itself to the geographic and material facts of the real world. But the Web is an unnatural world, one we have built for ourselves. The facts of nature drop out of the Web. And so we can see reflected in the Web just how much of our sociality is due not to the nature of the real world but to the nature of ourselves. The Web confronts us with a different sort of brute fact: we are creatures

who care about ourselves and the world we share with others; we live within a context of meaning; the world is richer with meaning than we can imagine.

The Web gives us an opportunity to rethink many of our presuppositions about our nature and our world's nature. Only by so doing can we begin to discern why the Web has excited us far beyond reasonable expectation. The hype about the Web hasn't been unwarranted, only misdirected. The conversation I believe we need to have is about what the Web is showing us about ourselves. What is true to our nature and what only looked that way because it was a response to a world that was, until now, the only one we had?

SMALL PIECES LOOSELY JOINED

chapter one

A NEW WORLD

WHEN MICHAEL IAN CAMPBELL used an online alias, no one was suspicious. After all, choosing a name by which you'll be known on the Web is a requirement for using America Online. Known as "Soup81" to his AOL buddies, the eighteen-year-old Campbell was considered a polite, even kind young man in the Florida town where he lived with his mother. At the end of 1999, he had finished his first semester at a community college and was working in a retail store during the day; at night, he pursued his dream by acting in plays at the Cape Coral Cultural Theater. On December 15, he and millions of others were using America Online's "instant messaging" facility to type messages back and forth to their friends old and new. Instant messaging opens a window on your computer screen in which the letters being typed by your conversant show up as they're being typed. It's like watching over the shoulder of someone typing—even the effect of the Delete key is eerily evident—although that per-

son can be thousands of miles away. Indeed, Soup81 was chatting with sixteen-year-old Erin Walton in Colorado, someone he had never met before. He did know something about her, though: eight months earlier, a pair of teenagers had killed thirteen people at Walton's high school, Columbine, in Littleton, Colorado.

After some initial chitchat, Campbell typed a warning onto Walton's screen. Don't go to school the next day, his message said, because "I need to finish what begun [sic] and if you do [go to school] I don't want your blood on my hands."

When Walton, understandably shaken, alerted Columbine's school officials, they closed the school for two days and postponed exams. Three days later, the FBI got a court order in Denver forcing AOL to name the person behind the screen name "Soup81." The agents moved in quickly, questioning Campbell for ninety minutes and taking custody of his computer. A judge ordered Campbell to remain in the county jail without bail until his hearing a few days later.[1]

Campbell's mother blamed this aberrant behavior on the death of her son's father a month earlier. Campbell's lawyer, Ellis Rubin, made up a type of insanity—"Internet intoxication"—to excuse it. But Michael Campbell gave a different explanation. On *The Today Show* a few days later, seemingly trying to puzzle out his own behavior, he said that, as a dedicated actor, he was trying on a role. He was seeing what it would be like to be his favorite actor, John Malkovich.

"Internet intoxication" makes about as much sense as the "Twinkie defense"[2]—Dan White's supposed claim that junk food threw off his moral judgment—but at least it acknowledges that something about the Internet contributed to this

event. At the very least, had Campbell met Walton in person, his "channeling" of Malkovich would probably have come off as nothing more than a celebrity impression. The Internet allowed Soup81 to assume a persona and become someone that Michael Ian Campbell wasn't. In fact, Soup81 didn't usually go around threatening people online; this seems to have been an isolated incident. Although Soup81's actions on December 15, 1999, were atypical of the tens of millions of chats that take place every day, it is not at all unusual on the Web for someone to "try on" a personality and to switch personalities from chat room to chat room: behavior that would cause your family to plot an intervention off the Web is the norm on the Web. The very basics of what it means to have a self-identity through time—an "inner" consistency, a core character from which all else springs—are in question on the Web.[3]

Michael Campbell is, of course, an exception, which is why he got onto *The Today Show* and the other 300–400 million users of the Web did not. And that's why he served four months in a Florida jail as part of a plea bargain that also forbade him from using the Internet for three years. Fortunately, Campbell's story is not typical. But even the typical, everyday world of the Web is more alien than it at first seems. Take something as ordinary as visiting eBay. For example, I recently visited eBay after deciding that a quilt would make a perfect—or at least safe—housewarming present for a friend moving into his first house. . .

I type "quilt" into the page's search field. In about one second (I have a cable modem), eBay shows me a page listing the first 50 of 8,179 items for sale that include the word "quilt" in their titles, including books about quilts, fabric for making quilts,

quilt designs, and quilt stencils. Daunted by the 164 pages of listings, I search again, this time for "homemade quilt," and narrow the list to 16. That seems so few that I reconsider my search query and realize that I should probably search for "handmade" quilts, not "homemade" ones. Sure enough, I now find 248 items, listed according to which auctions are going to be over first. "Stunning Handmade Quilt w/Brilliant Colors" is closing in two hours and twenty-five minutes; its opening bid of $159 has attracted no takers. Too expensive for me, and apparently also for people who know more than I do about quilts. "NEW HANDMADE SMALL COLORFUL QUILT" closes three hours after that; four bidders have pushed the price to $26.09. The picture is small but the explanatory text has a homey touch:

> This quilt measures 56x72 and is very colorful. This quilt is new and will last a lifetime. This would be a perfect fathers day gift, or perfect on back of couch. Please e-mail me with any questions. Shipping will be 5.00. Thank you for looking.

Although the eBay page is formulaic, there's enough context for me to make some tentative judgments. The amateurish prose and layout of the page leads me to assume that the seller isn't full-time in the quilt business. But she seems not to have made the quilt herself because there's no mention of how long it took her and no story about why she made it and why she's now giving it up. Maybe this was a housewarming gift she doesn't like and wants to pass on. Could I be wrong about her? Definitely. But in this case it doesn't matter because the price is too far under the $75 I want to pay for this gift. I may be passing up the bargain of the century, but, as a naïve quilt buyer I have to trust

the pricing judgments of the other bidders. I go back to the listing of auctions.

Before I can investigate more offerings, my ten-year-old son slams the door and yells up a cheery "Hey-lo!" and I am distracted for the next couple of hours. It's shortly before dinner when I go back to eBay. On page three there's an auction for a red-and-white quilt currently listed at $66. The picture shows a pattern that I think my friend may like; the design can even be construed as a series of Jewish stars if you catch it at the right angle, which my friend will get a kick out of. The text says:

> This is a beautiful quilt made by my Great Aunt. It is in excellent condition. The colors are beautiful. It measures 89x72. Buyer pays $10 shipping and insurance.

The page tells me that the starting price for the piece was $40 and four people have bid on it so far. This is getting interesting. So, I click on the rating next to the seller's name and eBay takes me to a page of comments from people who have done business with her. Four people have rated her, all have rated her excellent, and each has written a one-line comment praising her to the skies. But I've bought from eBay before and I know how this works: after the sale, the seller and buyer each get to write a brief evaluation. Anything less than lavish praise is taken as veiled criticism. Grade inflation has hit eBay.

I didn't win that auction. And although my interactions with eBay were simple, they were based on assumptions that are quite different from my real-world assumptions. I assumed no locality for the seller and the bidders beyond an expectation that they were probably all on the North American continent;

it's possible that some were in other countries, although the complications of the real-world postal system discourage that. But the distancelessness of the Web is just the most obvious of the disconnects between it and the real world. You could even classify them by using some big concepts from the real world, such as space, time, self, and knowledge:

Space. eBay is a Web space that occupies no space. Its "near" and "far" are determined by what's linked to what, and the links are based not on contiguity but on human interest. The geography of the Web is as ephemeral as human interest: eBay pulled together a listings page for me based on my interest in handmade quilts while simultaneously building pages for thousands of others who had other, unpredictable interests. Each of us looked across the space that is eBay and saw a vastly different landscape: mine of quilts, yours of Star Wars memorabilia, someone else's of battery chargers.

Time. Earlier that morning, while waiting for my wife in our town center, I ducked into a store called Ten Thousand Villages that sells world crafts at prices fair to the artisans.[4] For ten minutes I enjoyed being a yuppie among the Chilean rain sticks and the Djembe drums from Burkina Faso. Then I saw my wife through the window, left the store, and closed the door behind me. Real-world time is a series of ticks to which schedules are tied. My time with eBay was different. As I investigated different auctions, placed a bid, and checked back every few hours to see if I'd been outbid, I felt as if I were returning to a story in progress, waiting for me whenever I wanted. I could break off in the middle when, for example, my son came home, and go back when I had the time. The Web is woven of hundreds of millions of threads like this one. And, in every case, we determine when and how long we will participate based solely on what suits us. Time like that can spoil you for the real world.

Self. Buyers and sellers on eBay adopt a name by which they will be known. The eBay name of the woman selling the quilt I was interested in was "firewife30." Firewife30 is an identity, a self, that lives only within eBay. If she's a selfish bastard elsewhere but always acts with honor in her eBay transactions, the "elsewhere" is not a part of firewife30 that I can know about or should particularly care about. The real-world person behind firewife30 may even have other eBay identities. Perhaps she's also SexyUndies who had 132 "sexy items" for sale at eBay while firewife30 was auctioning her quilt. Unlike real-world selves, these selves are intermittent and, most important, they are written. For all we know, firewife30 started out as firewife1 and it's taken her this many drafts to craft a self that feels right to her.

Knowledge. I began my eBay search ignorant about quilts. By browsing among the 248 quilts for sale, I inadvertently received an education. Yes, I could easily use the Web as a research tool, and at times during my quest I ran down some information—"sashing" is a border around each quilt block,[5] and a good quilter gets 10–12 stitches per inch[6]—but I learned more and learned faster by listening to the voices of the quilters on eBay. I got trained in the features to look for, what quilters consider to be boast-worthy, and what the other bidders thought was worth plunking their money down for. This was

unsystematic and uncertified knowledge, but because it came wrapped in a human voice, it was richer and, in some ways, more reliable: the lively plurality of voices sometimes can and should outweigh the stentorian voice of experts.

If a simple auction at eBay is based on new assumptions about space, time, self, and knowledge, the Web is more than a place for disturbed teenagers to try out roles and more than a good place to buy cheap quilts.

The Web* has sent a jolt through our culture, zapping our economy, our ideas about sharing creative works, and possibly even institutions such as religion and government. Why? How do we explain the lightning charge of the Web? If it has fallen short of our initial hopes and fears about its transformational powers, why did it excite those hopes and fears in the first place? Why did this technology hit our culture like a bolt from Zeus?

Suppose—just suppose—that the Web is a new world that we're just beginning to inhabit. We're like the early European settlers in the United States, living on the edge of the forest. We don't know what's there and we don't know exactly what we need to do to find out: Do we pack mountain climbing gear, desert wear, canoes, or all three? Of course, while the settlers may not have known what the geography of the New World was going to be, they at least knew that there was a geography. The Web, on the other hand, has no geography, no landscape. It has

*I purposely conflate the Internet and the Web throughout this book. The distinction is very real from the technical and historical perspectives, but it isn't being observed in the public consciousness: email and home pages seem to be part of the same phenomenon even though the former is the Internet and the latter is the Web.

no distance. It has nothing natural in it. It has few rules of behavior and fewer lines of authority. Common sense doesn't hold there, and uncommon sense hasn't yet emerged. No wonder we're having trouble figuring out how to build businesses in this new land. We don't yet even know how to talk about a place that has no soil, no boundaries, no near, no far.

New worlds create new people. This has always been the case because how we live in our world is the same thing as who we are. Are we charitable? Self-centered? Cheerful? Ambitious? Pessimistic? Gregarious? Stoic? Forgiving? Each of these describes how we are engaged with our world but each can also be expressed as the way our world appears to us. If we're egotistical, the world appears to revolve around us. If we're gregarious, the world appears to be an invitation to be with others. If we're ambitious, the world appears to await our conquest. We can't characterize ourselves without simultaneously drawing a picture of how the world seems to us, and we can't describe our world without simultaneously describing the type of people we are. If we are entering a new world, then we are also becoming new people.

Obviously, we're not being recreated from the ground up. We don't talk in an affect-less voice, express curiosity about the ways of earthlings, and get an irresistible urge to mate once every seven years. But we are rewriting ourselves on the Web, hearing voices we're surprised to find coming from us, saying things we might not have expected. We're meeting people we would never have dreamed of encountering. More important, we're meeting new aspects of ourselves. We're finding out that we can be sappier, more caustic, less patient, more forgiving, angrier, funnier, more driven, less demanding, sexier, and more

prudish—sometimes within a single ten-minute stretch online. We're falling into email relationships that, stretching themselves over years, imperceptibly deepen, like furrows worn into a stone hallway by the traffic of slippers. We're falling into groups that feel sometimes like parties and sometimes like battles. We're getting to know many more people in many more associations than the physics of the real world permits, and these molecules, no longer bound to the solid earth, have gained both the randomness and the freedom of the airborne. Even our notion of self as a continuous body moving through a continuous map of space and time is beginning to seem wrong on the Web.

If this is true, then for all the overheated, exaggerated, manic-depressive coverage of the Web, we'd have to conclude that the Web has not yet been hyped enough.

In 1995, when media coverage of the Web was at its most hysterical, psychologists at Carnegie Mellon University gave computers, software, and Internet access to ninety-three Pittsburgh families who had never been online before. While a significant portion of the globe was wearing out the thesaurus in the hunt for synonyms for "exciting" to describe the promise of the Web, and another portion with equal passion saw the Web as the final smut-filled convulsion of civilization, the Carnegie Mellon scientists calmly studied these families for two years, asking them questions about their patterns of usage, their outside interactions, and their mental states. In the fall of 1998, the results began to leak out: for a significant number of these families, "Internet use led to their having, on balance, less social engagement and poorer psychological well-being."[7] Not surprisingly, the study was featured on the front page of the *New York Times*.

Two years later, in the fall of 2000, another study was featured in the *New York Times*. Headlined "Who Says Surfers Are Antisocial?"—and ignoring the obvious riposte that it was the *Times* who had said it just two years earlier—the article reported that a study of 2,000 people by the University of California at Los Angeles had found that Internet users increased their contact with others, made online friends, and spent just as much time with their families as before. They were also watching 28 percent less television.[8]

The studies caused controversy individually and in comparison. Were the samples fair? Why didn't the Carnegie Mellon study use a control group? Had the Internet changed in the five years between the start of the first and the end of the second study, as suggested by one of the first study's authors?[9] But more was at stake than the quality of the science. That each of these opposing stories was front-page news exposed some of the disquiet behind the public passion for the Web. At the time the media were focused on how the Web was making twenty-five-year-old software jockeys into billionaires, how upstart companies were threatening the largest "bricks and mortar" corporations, and how investors were grumbling if they didn't make ten times their money in eighteen months. But we—the great mass of Web users—knew there was more to the story than how the money was being made and, later, lost. We knew the Web was affecting more than our bank accounts and our "shopping experience." It was changing the way we're social, for example.

The truth is that neither of these studies could really answer the question "Is the Web making us more or less social?" much

less the broader question "What is the Web doing to us as social animals?" Even if we assume that both studies are paragons of the scientific method, the best they could do is answer some highly specific questions: Are Net users watching more or less television? Are we spending more or less time with our friends in the real world? These questions are only interesting, however, because they give us factual pegs on which to hang our intuitive sense that something big is happening.

We're worried, we're giddy, we're confused. If our way of being social is different on the Web, it surfaces questions that give us vertigo. For example, much of our sociality depends upon drawing the line between our private and our public lives: a friend is close if you can tell her that you're secretly quite religious, that your sex life is other than she thought, that you're not as confident as you may seem. Likewise, it's a serious transgression to ask questions more personal than we're entitled to ask; "So, how much money do you make?" and "You and your spouse doing it much?" are more likely to prevent intimacy than to foster it. Because the line between public and private is so important to us—we use words such as "embarrassment" and "humiliation" to describe what happens when the line is crossed—we generally know the rules so well that we don't have to think about them. But the Web is putting us into positions where the lines are not just blurry but have been redrawn according to a new set of rules that don't yet make sense to us. Even something as straightforward as email is catching many of us unwittingly on the wrong side of the line. For example, in October 1999, Xerox fired forty people for email abuse.[10] At the beginning of December 1999, the *New York Times* fired twenty-three employees at a Virginia

payroll processing center for sending "inappropriate and offensive" email—reportedly off-color jokes. At the same time, the navy reported that it had disciplined more than five hundred employees at a Pennsylvania supply depot for sending sexually explicit email. These crackdowns on email "abuse" expose a fissure. On the one side, email is like mail—you type it in and send it to someone. On the other, email is like a conversation—you talk about whatever you want, you make jokes, you don't bother to re-read it before you send it, and you forget about it ten minutes later. So which is it? A formal letter or an informal conversation? Get it wrong, draw the line between public and private inaccurately, and you could end up being fired.[11]

Or worse. In May 2000, John Paul Denning found himself locked up in the Bellevue Hospital's ward for the mentally disturbed—his shoelaces confiscated as a precaution against suicide—because he'd written an email to an old friend in which he said, "Maybe I should stop showing people my new gun, but I'm so proud of it. Makes me feel like a real New Yorker," as well as some references to the mayhem he could commit.[12] New York University expelled Denning when they heard about this, although eventually a board of inquiry readmitted him when he was able to show that the email was simply dark humor sent to a close friend.

The problems we have finding the new lines between the public and the private are part of the more general problem of understanding how to coordinate the two worlds, one real and one virtual. Consider Tom Alciere, elected to the New Hampshire state legislature in November 2000.[13] The barrier was low: it costs $2 to register as a candidate, and the position

pays a lordly $100 a year . . . plus free passage through state highway tollbooths. A circuit-board inspector for a local electronics company, Alciere ran as a Republican in a heavily Democratic ward, although in his six previous bids at public office he had run variously as a Democrat and as a Libertarian. The four-way race received almost no coverage, and Alciere squeaked in with a fifty-five-vote margin, possibly because his name was listed first on the ballot. Only a couple of weeks after he was sworn in did anyone notice that The Honorable Tom Alciere had a home page that called for eliminating mandatory school attendance and removing the age restrictions on drinking. On a site devoted to the topic of suicide, Alciere weighed in with his suggestion that one way to get "sweet revenge against the government for making everybody's life miserable . . . is to waste as many cops as possible before you die." Turning to practical considerations, he recommended driving a truck into the crowd at a police officer's funeral. When the legislator resigned thirty-six days later, he sent an email that explained how he had managed to get himself elected: "Well, nobody asked me if I liked cops, or supported the drug laws, etc." Alciere told the truth about himself in a globally public forum. He did nothing to hide his views. It's quite likely that the voters in his district in New Hampshire have learned a lesson: what counts as "the public sphere" has changed. It now includes the Web. We're just not sure how.

You could look at these examples as anomalies—a quiet teenager who makes cruel threats on the Web; scores of workers who are fired for saying in email only what they would have

said in person; and a fringe candidate who's blunt about his outrageous views on the Web without any effect on his campaign. But just about everywhere we turn, the Web upsets our expectations. Sharing copyrighted music files seemed perfectly proper to 70 million Napster users. Companies that compete form cooperative Net marketplaces. Pornography that you once had to go to Sweden to find you can't now avoid. The best sources of information about products are online customer forums, not the companies that create the products. Children play ultra-violent online games with the innocence of a game of tag. Hundreds of millions of people are building a transnational infrastructure without guidance, assistance, or permission. So many things don't make sense on the Web that we're suffering from Anomaly Fatigue.

Perhaps it's just as well, for focusing on anomalies can be a way of denying the disturbing nature of what passes for normal. Just as arguments about, say, abortion are the least likely to lead to an understanding of the nature of morality—far better to watch how we humans accomplish our ordinary acts of decency—so, too, if we want to understand what the Web is doing to something as basic as our social natures, we need to look at our everyday experiences of the Web. Besides, does anyone really want to keep on arguing about Napster?

So let's not pound our heads against the anomalies. We can learn more by looking at something perfectly ordinary on the Web. For example, if we want to study the Web's effect on our sociality, we could look at "weblogs," or online journals, for there you can see the redrawing of the line between public and private. In 2000, a few sites began offering tools that made it so easy to create and maintain a weblog that all you had to do was

type in the content. As a result, an estimated 100,000 weblogs exist now, although the actual number is unknowable.

Let's take a random example. Someone named .Zannah (yes, the leading dot, the visual equivalent of a pierced tongue, is part of her Web identity) has a weblog titled "/usr/bin/girl" (the technoid-sounding name refers to standard Unix directories.)[14] The page's main serving consists of frequent write-ups about Web sites that .Zannah finds interesting:

> This site [www.compugarg.com] sells Computer Gargoyles, to watch over you as you surf the 'net. . . .
>
> Taco Joe's graphics are silly at best, which led me to believe that I wouldn't like this game. However, upon giving it a chance, I found myself somewhat enthralled with the taco making, roach squashing business. . . .
>
> Open Cola, the world's first open source cola. I have no idea how it tastes, but I'm fairly amused at the idea of an open-source food or drink. . . .

Good information that might help a hapless browser find some useful sites. But .Zannah isn't merely conveying information. In the left-hand margin, .Zannah lifts her veil, providing lists of what matters to her, including "recently acquired items" ("blue vinyl pants, rhinestone chain, hair toys, replicant shirt, glowsticks . . .") and a list that's harder to categorize:

> mixellanea randomosity:
> I am 65.465% insane.
> I'm 42% bitchy.
> I'm an idealist.
> I'm also sensitive.
> My geek quotient is 63.
> I'm a pink grapefruit.
> I'm right between pessimism & optimism.

If you follow the links, you find that these are the results of various sarcastic quizzes around the Web. Despite—or is it because of?—the irony and sarcasm, the reader begins to get a sense of this young woman.

Then, in one corner, there's a link to a personal home page, a second place for .Zannah to expose herself to the public in highly controlled ways.[15] The weblog page is updated more frequently than her home page, but the two pages also differ in the types of disclosures they publish. It's almost as if they were the views two different friends might have of her, each site drawing the line between the public and the private differently. The home page doesn't feel quite as free; it appears to be tied more closely to her offline self—for example, she discloses her physical location—although the differences are more in tone than content. In the upper left corner of her home page, there's a picture of her. She looks as if she's in her early twenties. Head bent down, black hair falling in parentheses past her face, her eyes looking up to make direct contact. An appealing, knowing face. But, if you leave your mouse cursor over the face for more than a few seconds, up pops a caption. It reads: "[just some random chick]." So, is the photograph of .Zannah or is it truly just a random photo? Her webcam is off right now, but the last image it recorded is there. The random chick is .Zannah all right. The caption is just some misdirection. Probably.

What's going on here? Personal revelations, but enough irony to make sure we don't trust them too much. A name that

begins with punctuation, a carefully constructed set of sarcastic lists that tell us about herself, and a clue that what we're reading is a mix of self-revelation and self-invention. Is she being sociable on the Web? She is certainly playing in public with others. But how can we make sense of the evidence about whether the Web is making us less social if we're not certain what it means to be social in this new world?

.Zannah is no Michael Ian Campbell; she is not channeling John Malkovich and making idle threats to a student recently terrorized in a school shooting. She's not insane and she's not an anomaly. For all her oddness, her quirkiness, her postmodern irony, .Zannah is the norm of the Web. She is what's ordinary. The real problem we face with the Web is not understanding the anomalies but facing how deeply weird the ordinary is.

When I met Mike O'Dell, he was chief scientist at UUnet, one of the main providers of the Internet "backbone," the wires and routers that in one sense are the Internet. We were at the first meeting of a small conference in intensely quaint Woods Hole, Massachusetts. O'Dell dominated the meeting. Although the conference was intended to bring together hard-nosed engineers and soft-hearted social commentators, O'Dell was so adept at using facts like brass knuckles and slapping us softies down with a swipe of his hand that we thought a second and a third time before venturing into the conversational arena. There seemed to be nothing he didn't know. When I went home and told my wife about the weekend, I mainly described how smart and intimidating I found O'Dell. Yet, within a few months, he and I had become good friends through email. It's a better

medium for us because neither of us is tempted to show off by being gratuitously right in public.

Almost a year after Big Hook, I wrote to Mike and asked him to take a guess at how much data at any one moment is in the wires that compose the Internet. He responded almost immediately. Based on guesstimates of the total mileage of wires carrying Net traffic and the average speed with which bits are moved through those wires, Mike estimated that at any one moment, between five and ten gigabytes of information are in the wires. A gigabyte is 1,073,741,824 bytes (2 to the 30th power)—call it an even billion—enough to encode about 3,000 books of average length. Thus, at any moment, the equivalent of a small library, 15,000 to 30,000 books, is in transit over the Internet. Just one wire going across the United States, O'Dell estimates, carries about 3 megabytes of information. If we consider not merely the text but all the other information that's included in a high-quality electronic book—information about page layout and fonts, for example—if an e-book of *Hamlet* started in Boston, Fortinbras would be ringing down the curtain just fifteen miles short of Akron, Ohio.[16]

Books stretched to the height of one bit and strung between telephone polls make for an arresting image, especially if one keeps in mind that these libraries are rushing through the wires at the speed of light, pulsing at intervals on the order of one ten-billionth of a second. O'Dell calls his calculation the number of "bytes in flight," a lovely phrase. Even though this view of the Internet isn't useful to most of us, it claims our attention. So do many views that have been put forward: the Web as technological marvel, as the millionaire-maker, as the modern Gold Rush, as the new economy that will raise all boats and sink old rules.

Then the weekly magazines arrive and the lead stories are about the anomaly of the week: the music our kids are downloading without paying for it when they wouldn't dream of shoplifting it; the bankrupt companies selling their lists of customers to creditors even though the customers thought they'd been assured of privacy; the juicy rumors being circulated by people who are sober and careful about what they say in the real world.

All these views of the Web are true enough and fair enough. But if we're to make any progress in understanding the Web's effect on us—including but certainly not limited to the question "Is the Web making us more or less social?"—we need something more than Yet Another View. We need a way to address this question and a thousand others, but we seem to lack the basic stance. We have a hundred ways of considering the Web, from bytes in flight to technological infrastructure to economic playing field to entertainment medium to global conversation to a wanker's paradise. But none seems adequate to the task. Our ways of thinking about the Web, even ones as evocative as Mike's bytes in flight, have tended to make the Web too small to account for the effect it's having.

If we were to investigate a "big idea" such as democracy, we would look at how its introduction in the eighteenth century affected a suite of related terms basic to our understanding of ourselves in a world of others: citizen, rights, duties, equality, justice, nation, government, authority, legitimacy, law, morality, human nature. In a parallel fashion, as we've looked at just one sample question about the Web—does it make us more or less social?—we've found ourselves brought to consider terms as

basic as self, society, friendship, knowledge, morality, authority, private, and public. It is a measure of the importance of the Web that to understand it we find ourselves rethinking bedrock notions of our culture.

But democracy had such a powerful effect, overturning governments and changing the social order, only because it occurred within an oppressive culture of monarchy and aristocracy. Who you were depended on who you were born as, and clearly not everyone was born equal. Democracy was an explosive idea only because this context of inequality pressed so hard against it. The Web's power likewise comes from the pressure of the atmosphere into which it was born. Just as the opposite of democracy was aristocracy, the opposite of the virtual world of the Web is the real world. The Web explodes out with precisely the same force with which the real world pushes in.

It's easy to see what was so oppressive about aristocracy and all that went with it, but what's so oppressive about the real world? Yes, having to travel distances to get where we're going is a bother, but the Web's distancelessness isn't enough to explain the force with which the Web has hit us. After all, telephones and faxes also eliminate distance. Something more has to be going on.

A few years ago, I listened to a woman calling in to a legal expert on a radio talk show. Her basement apartment had taken in a few feet of water in a flood. She didn't have insurance and the landlord's insurance didn't cover the damage. The legal expert explained that the caller was out of luck. Floods happen. The caller was outraged. Who was going to replace her appliances and furniture, not to mention the keepsakes now ruined forever? This was an injustice! I listened with sympathy, for I

had been through a flood many years ago, but I also listened with amazement. A bad thing had happened to this woman, so she expected compensation to make it all better. It was as if the world had not lived up to its side of a contract.

Her demand was unreasonable, but her premises, I believe, are widely shared in our culture. Bad things aren't part of "the deal." There isn't a problem we don't assume we will solve eventually. Cancer will soon be cured. AIDS is on the run. We'll figure out a way to mend the hole in the ozone layer and to reverse global warming. Terrorism will be rooted out. We just need to marshal the facts and manage the project. The dinosaurs could only look up in dismay as the asteroid slammed towards them, but we'll organize an international project, preferably with Bruce Willis at the helm, and we'll nuke that sucker back to the Stone Age. We are the masters of our fate. We can manage our way out of any problem.*

The building of the Hoover Dam is perhaps the emblematic example of the power of traditional management. The six companies responsible for the project had to construct a city in the desert to house 5,000 workers, complete with a water and sewer system, a city hall, laundries, schools, police and fire departments, and a hospital. They had to build a 222-mile extension of the power system to bring electricity to the site. They spent seven months building a 22.7-mile railroad and a 400-car switchyard. To deliver materials, they built a cableway 1,580 feet long. Even the simplest aspects of the dam's construction

*As I write this, the United States is reeling from the attack on the World Trade Center and the Pentagon. This has shaken our sense of mastery with results that cannot yet be predicted.

often turned out to be hideously complex, requiring ingenious solutions. For example, moving pipes a mile and a half from their fabrication plant required building specially designed 16-wheeled, 38-foot-long trailers with tractors in the rear devoted simply to braking, and two-tier cars to bring the pipes to their final destination.[17] The Hoover Dam is a masterpiece of management as well as of engineering.

The Web, however, is teaching us a different lesson about management. Consider the Web as a construction project. It's the most complex network ever created. It is by many orders of magnitude the largest collection of human writings and works in history. It is far more robust than networks far smaller, yet it was created without managers. In fact, it succeeded only because its designers made the conscious decision to build a network that would require no central control. You don't need anyone's permission to join in, to post whatever you want, to read whatever others have posted. The Web is profoundly unmanaged, and that is crucial to its success. It takes traditional command and control structures and busts them up into many small pieces that then loosely join themselves—and that, too, is crucial to its success.

As a result, the Web is a mess, as organized as an orgy. It consists of voices proclaiming whatever they think is worth saying, trying on stances, experimenting with extremes, being wrong in public, making fun of what they hold sacred in their day jobs, linking themselves into permanent coalitions and drive-by arguments, savoring the rush you feel when you realize you don't have to be the way you've been.

The Web has driven through the plate glass window of traditional management. Because every surprise is an affront to the

managed world—not anticipating market trends or the actions of competitors can give a management team the opportunity to "pursue other interests"—we agree to play by the rules so that we won't surprise anyone and no one will surprise us. We become professionals by adhering to a code of conduct that has us all sounding the same. We manage our time into neat segments of work, home, recreation, sleep. We focus on the facts because that's how we get predictability. We aim for an objectivity that suppresses individual viewpoints and passion.

But we pay a price psychologically and sociologically for repressing our differences and it goes beyond psychology. It has to do with the fundamentals of our world. Our real-world view of *space* says that it consists of homogenous measurable distances laid across an arbitrary geography indifferent to human needs; the Web's geography, on the other hand, consists of links among pages each representing a spring of human interest. Real-world *time* consists of ticking clocks and the relentless schedules they enable; on the Web, time runs as intertwining threads and stories. In the real world, *perfection* is held as an ideal we humans always disappoint; on the Web, perfection just gets in the way. In the real world, *social groups* become more impersonal as they get larger; on the Web, individuals retain their faces no matter what the size of the group—even in the "faceless mass" of the public. In the real world, we have thinned our knowledge down to a flavorless stream of verifiable facts; on the Web, knowledge is fat with stories and voice. Our "realistic" view of *matter* says that it's the stuff that exists independent of us, and as such it is essentially apart from whatever meanings we cast over it like shadows; the matter of the Web, on the other hand, consists of pages that we've built, full of intention

and meaning. In the real world, to be *moral* means we follow a set of principles; while on the Web, resorting to principles looks like prissiness, and authenticity, empathy, and enthusiasm instead guide our interactions.

If the Web is changing bedrock concepts such as space, time, perfection, social interaction, knowledge, matter, and morality—each a chapter of this book—no wonder we're so damn confused. That's as it should be. A new world is opening up, a world that we create as we explore it. .Zannah is inventing it, Michael Ian Campbell is abusing it, and every person browsing and posting is setting bytes in flight that shape this new world. Space, time, perfection, social interaction, knowledge, matter, and morality—this is the vocabulary of the Web, not the bits and the bytes, the dot-coms and not-coms, the e-this and B2That. The Web is a world we've made for one another. It can be understood only within a web of ideas that includes our culture's foundational thoughts, with human spirit lingering at every joining point.